Stefano Bartolini

University of Siena

Marcin Piekalkiewicz

University of Siena

Francesco Sarracino

Statec

A Social Cure for Social Comparisons

Abstract

Social comparisons have severe negative consequences for happiness, health, and economic decisions. Is there a remedy? Some research suggests that social comparisons are intrinsic human characteristics rooted in the biology of the brain. We offer a different view based on approximately half a million interviews from nationally representative surveys. Specifically, we assess whether people with thriving social lives suffer less from social comparisons than others. Controlling for demographic factors, we find that isolated people are more likely to be concerned about whether they earn more or less than others. Conversely, the well-being of individuals with rich social lives does not depend on keeping up with the Joneses. This result is reflected at the country level: in countries that are socially flourishing, the differences in well-being between income groups are small, which is a consequence of the relatively small impact of income comparisons on well-being. This evidence suggests that social relations can be a cure for social comparisons. We discuss a few policies to promote social relations, relating to education reform, urban planning, and advertising regulation.

Introduction

Social comparisons negatively affect people's happiness, physical and mental health, and economic decisions. Social comparisons refer to people's tendency to compare with self-relevant individuals – those who form their so-called reference group. Economic studies showed that income comparisons – an economic form of social comparisons -- are a powerful source of dissatisfaction in people's lives (Clark and Senik 2010, Luttmer 2005). The so-called "need to keep up with the Joneses" is a driver of the disappointingly absent impact of economic growth on subjective well-being (Easterlin 1974, Easterlin et al. 2010), a reliable measure of how people fare with their lives (Diener at al. 2018). Absolute income -- which measures individuals' purchasing power -- matters for subjective well-being, but income comparisons thwart the potential for national income growth to improve the human lot. Economic growth would increase subjective well-being if only absolute income mattered, as usually assumed by economists. Yet, in an economy where income comparisons matter for well-being, economic growth is a statistical mirage because it does not measure the relevant output. Such an economy produces winners and losers. Anyone's gain in a positional race is accompanied by another's loss, in a zero sum game.

Social comparisons negatively affect physical health as well. Studies have identified income comparisons as the explanation for why individuals with lower relative income have higher morbidity, after accounting for the well-established effects of absolute income on health (Pham-Kanter 2009, Subramanyam et al. 2009). As high income inequality exacerbates income comparisons (Cheung and Lucas 2016, Kondo et al. 2008), more unequal countries exhibit higher morbidity and mortality than countries with lower income inequality (Wilkinson and Pickett 2010).

Income comparisons hinder physical health because they induce stress and ill-being among people in relatively low positions. Stress and ill-being increase the risk of physical disease because they lead people to engage in risky health behaviors (smoking, not exercising, alcohol abuse) and they weaken the immune, endocrine and cardiovascular systems (Wilkinson and Pickett 2009, Hawkley et al. 2003). Hundreds of studies document the longitudinal association between subjective well-being and longevity and health at later stages in life (Lyubomirsky et al. 2005, Diener at al. 2018, Hemingway and Marmot 1999). Moreover, social comparisons are a powerful predictor of contemporaneous and future mental health (Wilkinson and Pickett 2019, Mujcic and Oswald 2018, Gold 1996, Smith et al. 1999).

Income comparisons affect economic decisions because they drive people into over-consumption and over-work (Hirsh 1976, Neumark and Postlewaite 1998, Bowles and Park 2005). Layard (2006) advocates policies that would reduce the incentives to the positional race and the associated waste of effort and resources.

In sum, social comparisons have severe negative consequences. Unfortunately, the importance of social comparisons seems to be on the rise. A cross-country survey conducted by Ipsos in 2013 documented that nearly 70% of Chinese people and 50% of Americans "feel under a lot of pressure to be successful and make money" (Ipsos 2013). Significant importance placed on social comparisons, such as success and status, is part of the definition of materialism (Kasser 2002). The American and Chinese figures are the result of a decades-long rise in materialism (Twenge and Kasser 2013, Easterlin and Crimmins 1991, Luo 2015, Brockmann et al. 2009, Bartolini and Sarracino 2015).

Is there an antidote to the negative impact of social comparisons? Some evidence suggests a pessimistic response: comparisons are rooted in human evolution and in the biology of the brain. Studies on animals' behavior document the existence of social comparisons among primates and other group animals (Schmitt et al 2016, Hopper et al. 2014), and research in neuroscience found evidence for the importance of social comparison on reward processing in the human brain (Fliessbach et al. 2005). However, the increasing role of keeping up with the Joneses, in the social, economic and psychological experience of large chunks of the human population, suggests that biology and evolution do not tell the whole story. Economic factors, such as income inequality, affect the importance of social comparisons in peoples' life. Moreover, many studies in social psychology suggest that the social context matters too. These studies documented a strong association between materialism and poor social capital. Social capital refers to one's social engagement and the quality and quantity of her connections with other individuals and the community (Putnam 2000). The more people value materialistic goals, the less likely they are to be empathic (Sheldon and Kasser 1995) and act cooperatively in social dilemma games (Sheldon et al. 2000), and the more likely they have manipulative and authoritarian attitudes towards interpersonal relationships (McHoskey, 1999, Duriez et al. 2007), they engage in unethical business behavior (Tang and Chiu 2003), as well as anti-social behavior like cheating, stealing, and being aggressive (Cohen and Cohen 1996, Kasser and Ryan 1993).

In contrast to social comparisons, social capital positively affects subjective well-being (Helliwell and Aknin 2018). Social comparisons and social capital are considered to be two mutually independent factors that influence well-being. However, this may not be the case: findings from social psychology suggest the hypothesis that social capital moderates the impact of social comparisons on subjective well-being. According to this hypothesis, positional competition affects the well-being of people with poor social and affective bonds more than that of individuals with thriving social lives. Status and success offer compensation to people with poor social capital.

This hypothesis has never been tested. Yet, it is important because it provides evidence concerning whether social capital can be an effective therapy for social comparisons. In the affirmative case, policy makers could adopt policies to promote social capital and thereby counteract the negative consequences of social comparisons. Our contribution is to test whether income comparisons are less important for the subjective well-being of individuals with rich social lives, using data from surveys administered on hundreds of thousands of European residents. In particular, we test this relationship within and across individuals, using longitudinal and cross-sectional data. Additionally, we test whether the same result holds for the residents of socially rich countries, compared to those of socially poor countries.

We also analyze whether social capital moderates the relationship between absolute income and subjective well-being. There are good reasons to suspect that this may be the case. Materialistic individuals, who tend to have poor relationships, are highly concerned with the absolute level of their income – beyond its relative level. There are also economic reasons to expect that social capital moderates the relationship between absolute income and subjective well-being. Social capital – in the form of family, friends and community networks – freely provides individuals with goods and services that can be substituted with ones that must be purchased. For instance, if we have few friends and the city has become dangerous, we can spend our evenings at home enjoying all kinds of home entertainment. If the frenzied and unlivable climate of our lives and our cities distress us, we can lift our spirits with a holiday in some tropical paradise. If we are afraid, we can protect our possessions with alarm systems, security doors and private guards. If we do not trust someone, we can pay to have her monitored and so on. In economic terms, in each example social capital and absolute income are substitutes in the utility functions of individuals.

In the next section, we show the results from the analysis of individual data retrieved from three European surveys. In the subsequent section, we extend our analysis to the cross-country

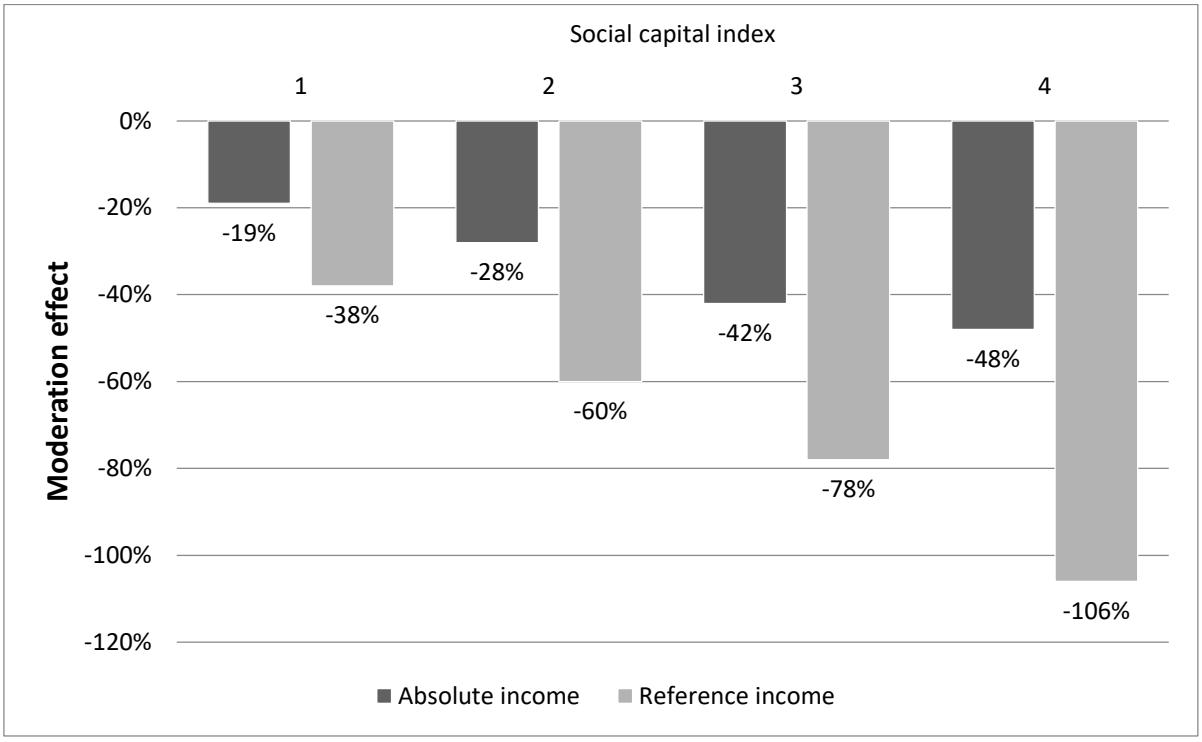
level. The methodological details supporting our analyses are presented in a dedicated section, after the concluding remarks.

Social capital matters

To test whether social capital moderates the relationship between income comparisons and subjective well-being, we estimate a subjective well-being regression in which we interact social capital with a measure of income comparisons, namely reference income. Reference income is defined as the average income of the reference group (see the section on Methodological aspects). We also interact social capital with absolute income.

Using more than 150,000 interviews from the German Socio-Economic Panel (SOEP), we find that the correlation between income (both absolute and reference) and life satisfaction -- a widely used measure of subjective well-being -- is weaker for people with thriving social lives than for others (see figure 1). Socially engaged individuals are not concerned about reference income: their well-being is unrelated to whether the Joneses are more or less well-off. With regard to absolute income, the life satisfaction of a socially isolated person (social capital index = 0) depends twice as much on her absolute income than the life satisfaction of a socially active person (social capital index = 4).

Figure 1. Moderation effects: absolute and relative income matter less for the life satisfaction of people with rich social lives (data: SOEP 1985-2011)

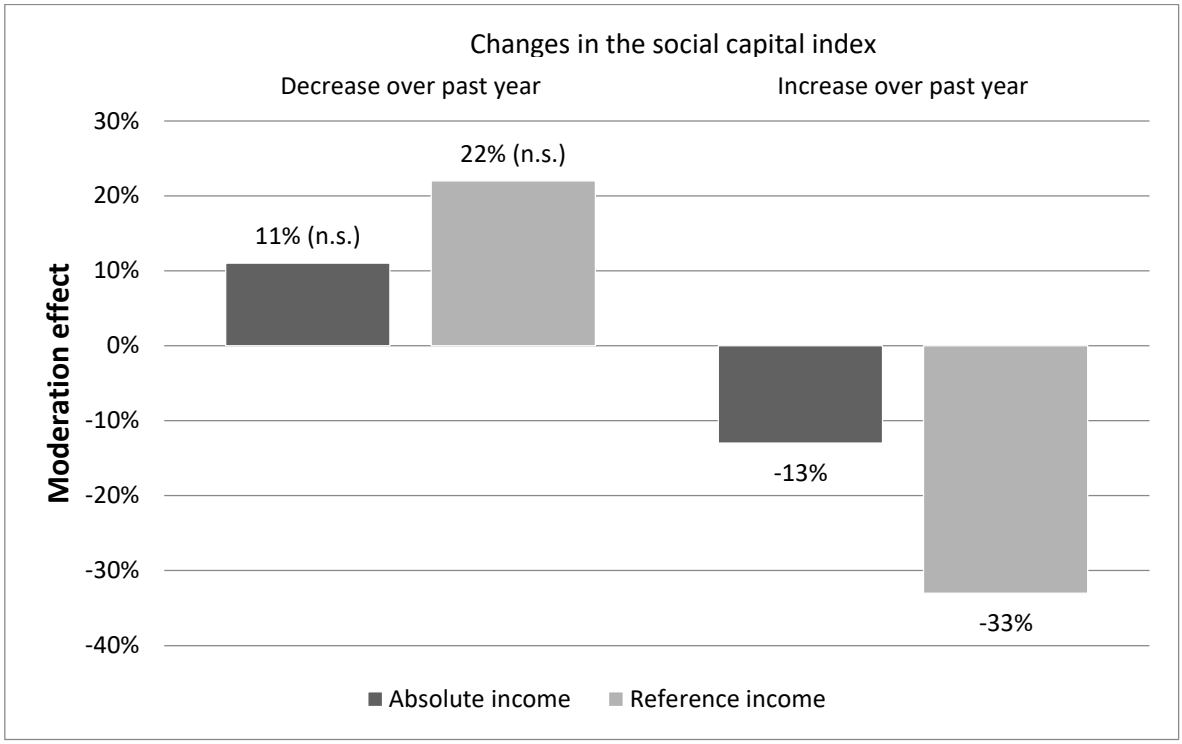


Note: Moderation effects indicate by how much each level of the social capital index reduces the income coefficients of the life satisfaction regression. The reference category is social capital index = 0. The social capital index reaches a maximum score of four if a person is involved in the following four activities at least once a month: social gatherings, helping friends, volunteering, participation in local politics. The index has a minimum score of zero for persons who are involved in such activities less often than once per month.

Method: OLS regression with individual fixed effects and interaction effects. Effects are significant at 10% or more.

We exploited the longitudinal structure of the SOEP, in which the same people are followed over time, to examine whether the importance of absolute and reference income changes when social capital changes throughout people's lives. We found that absolute income becomes 13% less important for people's life satisfaction if their social activities increased over the previous year, while reference income loses one third of its importance (see figure 2). In other words, past increases in social capital reduce the importance of absolute and reference income for life satisfaction. This lagged effect suggests that the decline of social capital can raise income concerns.

Figure 2. Past changes in social capital affect the association of absolute and relative income with life satisfaction (data: SOEP 1985-2011)



Note: Moderation effects indicate by how much past changes of the social capital index modify the income coefficients of the life satisfaction regression. The reference category is no change of the social capital index. In each year, the social capital index ranges from 0 to 4. Its changes are the difference between two consecutive years.
Method: OLS regression with individual fixed effects and interaction effects. n.s.: not statistically significant. When not specified, the effects are significant at 10% or better.

We checked the robustness of the results reported in figures 1 and 2 using European-wide data consisting of nationally representative surveys with more than 350,000 interviews. Data were retrieved from the European Union Statistics on Income and Living Conditions (EU-SILC) and the European Social Survey (ESS). The use of various measures of subjective well-being, social capital, absolute and reference income confirms our conclusion from Germany: social capital moderates the role of social comparisons for well-being (see the second row of tables 1 and 2, and the second and third rows in table 3). The use of generated instruments, a technique to deal with possible bias from omitted variables or reverse causality, suggests that relational poverty increases social comparisons (table 2). Isolated people are more likely to be concerned about whether they earn more or less than others.

The first row in tables 1, 2 and 3 also confirms that social capital moderates the relationship between absolute income and well-being: the absolute income coefficient of the subjective well-

being regression is roughly half the size for people with rich social lives compared to isolated individuals, in each table. However, for each level of social capital the moderating role is larger for reference income than absolute income.

This evidence suggests that relational poverty stimulates the quest for money as a way to cope with poor relationships, rather than a way to better lives.

Table 1. Results from EU-SILC data (2013) confirm that the subjective well-being of individuals with rich social lives depends less on absolute and reference income

	Life satisfaction		**Frequency of feeling downhearted or depressed**		**Job satisfaction**	
	Social capital index		**Social capital index**		**Social capital index**	
	1	**2**	**1**	**2**	**1**	**2**
Absolute income	-13%	-45%	-33%	-55%	-39%	-56%
Reference income	-23% (n. s.)	-102%	-56%	-102%	-57%	-72%

Note: Moderation effects indicate by how much each level of the social capital index reduces the income coefficients of the subjective well-being regression. The reference category is social capital index = 0. The social capital index has a maximum score of 2 if a person trusts others and she meets friends at least once per month. The index has a minimum score of zero for persons who do not trust others and meet friends less often than once per month.

Method: OLS regression for three alternative proxies of subjective well-being. n.s.: not significant. When not specified, the effects are significant at 10% or better.

Table 2. Instrumenting social capital: moderation effects (data: EU-SILC 2013)

	Life satisfaction		Frequency of feeling downhearted or depressed		Job satisfaction	
	Social capital index		Social capital index		Social capital index	
	1	2	1	2	1	2
Absolute income	-20%	-53%	-38%	-64%	-43%	-61%
Reference income	-41%	-112%	-61%	-108%	-83%	-109%

Note: Moderation effects indicate by how much each level of the social capital index reduces the income coefficients of the subjective well-being regression. The reference category is social capital index = 0. The social capital index has a maximum score of 2 if a person trusts others and she meets friends at least once per month. The index has a minimum score of zero for persons who do not trust others and meet friends less often than once per month.

Method: Two-Stage Least Squares regression for three alternative proxies of subjective well-being using the method of generated instruments (Lewbel, 2012). Effects are significant at 10% or better.

Table 3. Results from ESS data (2012) confirm that absolute and reference income matter less for the well-being of people with thriving social lives.

	Life satisfaction		Happiness		Happy: past week	
	Social capital index		Social capital index		Social capital index	
	1	2	1	2	1	2
Absolute income	-27%	-68%	-32%	-73%	-21%	-85%
Income rank 1-3	-35% (n.s.)	-130%	-64%	-176%	-6% (n.s.)	-145%
Income rank 8-10	-62%	-101%	-97%	-142%	-96%	-133%

Note: Moderation effects indicate by how much each level of the social capital index reduces the income coefficients of the subjective well-being regression. The reference category is social capital index = 0. The social capital index has a maximum score of 2 if a person trusts others and she meets friends, relatives or work colleagues at least once per month. The index has a minimum score of zero for persons who do not trust others and meet friends less often than once per month. In the ESS relative income is measured by income rank. The ranking ranges from 1 to 10 according to income deciles.

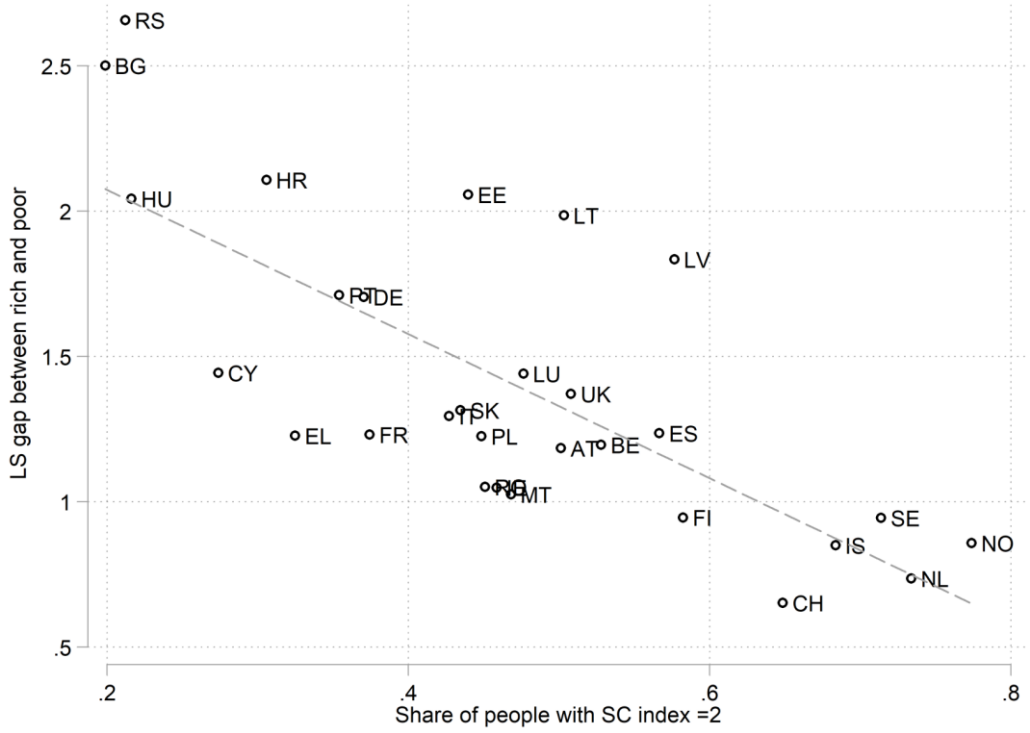
Method: OLS regression for three alternative proxies of subjective well-being. n.s.: not significant. When not specified the effects are significant at 10% or better.

Socially rich countries have low well-being inequality

To what extent does money buy happiness? At aggregate level, our findings suggest that the answer depends on a country's social capital. In socially rich countries the distribution of income

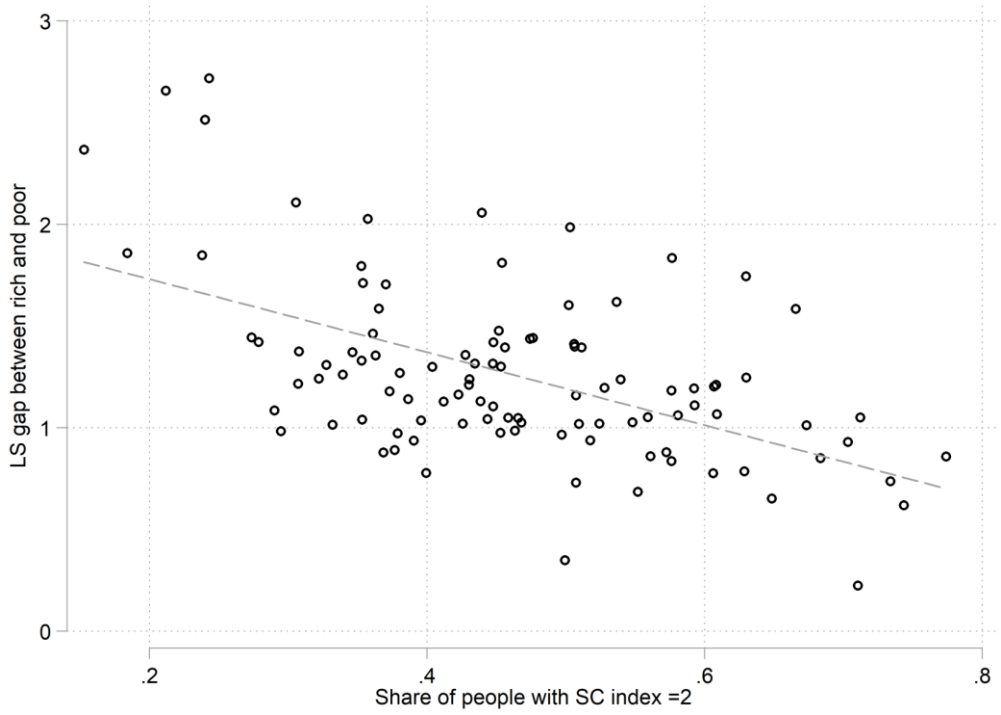
should affect the distribution of well-being less than in socially poor countries because material concerns matter less for people with rich social lives. The evidence is consistent with this prediction. Across 29 European countries and 99 regions, the share of individuals with high social capital negatively correlates with the difference (gap) between the average life satisfaction of people in the richest and poorest income quintiles (see figures 3 and 4).

Figure 3: The life satisfaction gap between rich and poor people is smaller in countries with a rich social life than elsewhere (29 European countries; data EU-SILC 2013.)



Note: Social capital is measured as the share of respondents with a social capital index = 2. The social capital index has a maximum score of 2 if a person trusts others and meets friends at least once per month. Life satisfaction ranges on a 0 to 10 scale, where largest scores stand for higher life satisfaction. Aggregated data are computed from individual data using sample weights.

Figure 4. The life satisfaction gap between rich and poor people is smaller in regions with a rich social life (99 European regions; data EU-SILC 2013)



Note: Social capital is measured as the share of respondents with a social index equal to 2. The social capital index has a maximum score of 2 if a person trusts others and meets friends at least once per month. Life satisfaction ranges on a 0 to 10 scale, where largest scores stand for higher life satisfaction. Aggregated data are computed from individual data using sample weights.

The difference between the life satisfaction of rich and poor people is relatively low in countries and regions where the share of socially active individuals is greater. In places with lower shares, money matters more for well-being. For instance, in Serbia and Bulgaria, where social capital is very low, the difference in life satisfaction between the rich and the poor is more than 2.5 points (on a 0-10 scale), whereas in socially rich countries – such as Switzerland or Netherlands – it is around 0.7.

One may think that such differences are due to income inequality, which is greater in Serbia and Bulgaria than in Switzerland or Netherlands. However, income inequality only partially affects the differences in well-being between income groups. Holding constant the Gini index of the income distribution, countries and regions where social capital is high still exhibit smaller differences in life satisfaction between income groups. Also, this effect does not depend on GDP per-capita (see tables 4 and 5). The negative association between the life satisfaction gap between rich and poor people

and social capital is further supported by European Social Survey data, which covers 29 European countries (see figure A.2 and table A.15 in the online Appendix).

Table 4. Controlling for the Gini index of income and GDP per-capita, the life satisfaction difference between rich and poor people is smaller in countries with high social capital than elsewhere (29 European countries; data EU-SILC 2013).

	Life satisfaction gap between rich and poor people (standardized coefficients).			
	(1)	(2)	(3)	(4)
Share of people with SC index = 2	-0.741***			-0.502***
	(-6.01)			(-3.14)
Gini index		0.657***		0.291*
		(4.54)		(1.95)
GDP per capita			-0.535*	-0.109
			(-1.89)	(-0.85)
Number of observations	29	29	29	29
Adjusted R^2	0.532	0.410	0.260	0.576

*Note: The unit of analysis are countries. The dependent variable is the difference in average life satisfaction (0-10) between the first and fifth income quintile in a given country. All coefficients are standardized for comparability. T-statistics in parentheses. * p < 0.1, ** p < 0.05, *** p < 0.01. Aggregated figures are computed from individual data using sample weights.*

Method: OLS regressions with robust standard errors.

Table 5. Controlling for the Gini index of income and GDP per-capita, the life satisfaction gap between rich and poor people is smaller in regions with a rich social life than elsewhere (99 European regions; data EU-SILC 2013).

	Life satisfaction gap between rich and poor people (standardized coefficients).			
	(1)	(2)	(3)	(6)
Share of people with SC index = 2	-0.525***			-0.498***
	(-5.28)			(-4.95)
Gini index		0.306**		0.241**
		(2.60)		(2.15)
GDP per capita			-0.201	0.019
			(-1.61)	(0.27)
Number of observations	99	99	99	99
Adjusted R^2	0.268	0.0846	0.0304	0.311

Note: The unit of analysis are regions. The dependent variable is the difference in average life satisfaction (0-10) between the first and fifth income quintile in a given region. All coefficients are standardized for comparability. T-statistics in

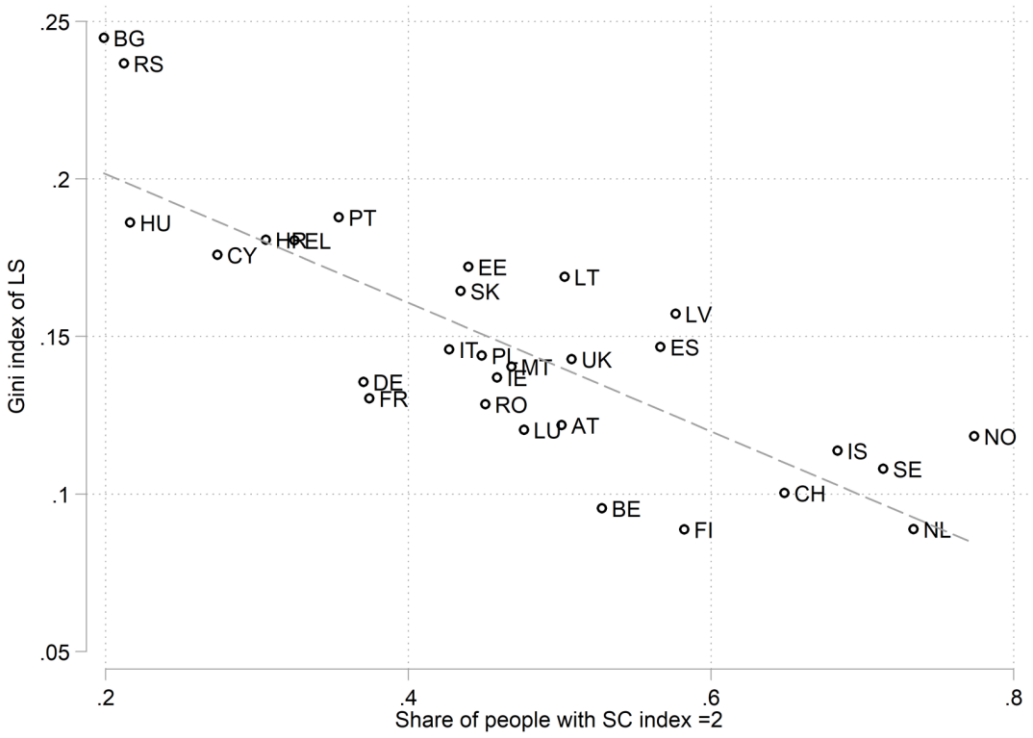
*parentheses. * p < 0.1, ** p < 0.05, *** p < 0.01. Aggregated figures are computed from individual data using sample weights.*
Method: OLS regressions with robust standard errors.

The cross-country results reflect the findings based on individual data presented in the previous section. The more important income is for well-being, the more income disparities translate into well-being disparities between income groups. In countries with high social capital, money is less important and the life satisfaction difference between income groups is relatively small. This result is driven by the moderating effect of social capital, which is stronger for income comparisons than for absolute income.

The impact of social capital on the distribution of well-being goes beyond the moderation of the income-well-being relationship. People living in socially rich countries experience less well-being inequality than others. In our sample of European countries (from EU-SILC), the share of respondents with high social capital negatively and significantly correlates with the Gini index of the life satisfaction distribution (see figure 5).[1] In other words, in countries rich in social capital, the inequality in well-being between income groups is low, and the overall inequality of well-being is low. This result is also confirmed by the analysis of ESS data (see the online Appendix, figures A.2 and A.3). The resilience-enhancing effect of social capital may partially explain this finding. Indeed, beyond social comparisons, social capital also moderates the negative impacts on well-being due to adverse life events such as sicknesses, being subject to discrimination, or being unemployed (Helliwell et al. 2016).

[1] The same result holds if we use other measures of well-being inequality, such as the difference between the top and the bottom quintiles of life satisfaction (see figure A.1 in the Online Appendix).

Figure 5. Well-being inequality is low in socially rich countries (29 European countries; data: EU-SILC 2013)



Note: The vertical axis shows the Gini index of life satisfaction. Social capital is measured as the share of respondents with a social capital index equal to 2. Aggregated figures are computed from individual data using sample weights.

Policies for social capital

Our results support the view that income comparisons are related to individuals' poor social experience. Social comparisons thrive amidst loneliness, suggesting that people engage in the race for position as compensation for poor relationships. In particular, the subjective well-being of people with high levels of social capital is unrelated to social comparisons. Social capital also moderates the relationship between absolute income and well-being. However, the moderating role is smaller for absolute income than for reference income. Indeed, at high levels of social capital, absolute income affects individual well-being while reference income does not. This evidence suggests that economic growth should increase well-being in socially flourishing societies. In countries where economic growth is accompanied by decreasing subjective well-being, such as China and the US, declining social capital co-existed with increasing social comparisons (Putnam 2000, Bartolini and Sarracino 2015, Blanchflower and Oswald 2004). On the other hand, northern

European countries exhibit positive trends of both subjective well-being and social capital (Sarracino 2012, Mikucka et al. 2017).

In economic terms, our findings support the view that both absolute and relative income substitute for social capital in the utility functions of individuals. Our evidence is inconsistent with the hypothesis that income variables and social capital are complements.

Evidence of successful policy implementation suggests that public policies for social capital are possible in at least three domains: urban planning, education, and advertising. Urban planning plays a major role in the formation of social capital. High residential density, walkability, pedestrian areas, parks, car restrictions, public transport and cycling can relieve the pressure of cars on common urban space, which is essential to enhance social capital. According to New Urbanism, an urban design movement, when cities and neighborhoods are organized in this way residents are more likely to walk about, thus having more chances for interaction (e.g., encounters, conversations, exchange of favors) (Kim and Kaplan 2004, Lund 2003, Rogers et al 2010). This enhances the neighborhoods' social fabric, the engagement of residents in neighborhood-related activities, and the sense of community. Urban planning aimed at social capital is well-established in many northern European cities and is being taken up across the world. This planning has positive effects on the general population, but in particular on the relational opportunities of individuals with reduced mobility, such as the elderly and children, whose connections largely depend on the existence of a social fabric within walking distance. Elderly and children are the population groups with the highest risk of social isolation. In the US 80% of young people under 18 years of age and 40% of individuals over 65 years report feeling lonely at least sometimes (Berguno et al. 2004, Pinquart and Sorensen 2001, Weeks 1994). The share of students walking to school collapsed over the past decades (McDonald 2007, Hillman et al. 1990), as well as the 'radius of activity' - the area around their home where children are allowed to roam unsupervised (Gaster 1991). The mobility and independence of children has plummeted everywhere in the industrial world, resulting in relational deprivation. When kids used to play on the street, they formed their own groups, and involvement in group interpersonal dynamics taught them social skills that would accompany them throughout their lives.

Also education, especially teaching practices, heavily impact the development of social skills during young age. Participatory teaching practices have been shown to be supportive of several dimensions of students' social capital, including cooperation with other students and teachers, membership in associations, trust in institutions, and participation in civil society (Algan et al. 2011).

Participatory teaching emphasizes students working in groups on common projects, in student-centered classrooms, where the central relationship is between students. Participatory practices contrast vertical teaching, where teachers primarily lecture and ask students questions, students mostly take notes or read textbooks, and the central relationship in the classroom is between the teacher and the students. Algan and colleagues' results support the notion that beliefs and skills underlying social capital are acquired through the practice of cooperation. Predictably, schooling practices that are more cooperative form individuals that are more cooperative. Many northern European countries have increasingly integrated participatory teaching into mainstream education (Brulè and Veenhoven 2014). Such teaching methods characterize Montessori education – a century-old schooling system (Biswas-Diener 2011). Lillard and Else-Quest (2006) found that Montessori education fosters social and academic skills more than traditional education.

Advertising negatively affects social capital and increases social comparisons, especially for children and teenagers. In the last few decades, they have become the primary target of advertising. In the United States, total spending on advertising targeting children in the early 2000s was 150 times the amount spent in 1983 (Schor 2004). Mounting advertising is bad news because since the 1970s, studies have documented a relationship between exposure to advertising and materialism in children (Goldberg and Gorn 1978, Pollay 1986, Greenberg and Brand 1993, Buijzen and Valkenburg 2003, Schor 2004, Nairn et al. 2007). Advertising promotes the race to keep up with the Joneses. It fosters consumption by triggering feelings of exclusion in those who do not buy the advertised products (Schor 2004). Similar to adults, children's materialism is bad for their social capital: it is associated with family conflict, less generosity and more anti-social behaviour (Buijzen and Valkenburg 2003, Nairn et al. 2007, Cohen and Cohen 1996, Kasser and Ryan 1993, Kasser 2005). Various western countries have regulated advertising as a consequence of an increasing awareness of the harm associated with mounting commercial pressure on children and teenagers. Sweden banned television advertising to children less than 12 years of age in 1990. Norway and Greece prohibit advertisements aimed at small children. Greece also banned advertising of children's toys between 7am and 10pm. New Zealand prohibits advertising of junk food. Austria and Flanders (Belgium) do not allow ads targeting children before, during or after children's TV programs. Several countries - such as Australia, Canada, and the UK - have powerful advertising regulating authorities, who are at the forefront in regulating children's media (Lisosky 2001, Caron and Hwang 2014). Advertising fosters social comparisons among adults as well; thus, regulating advertising would benefit adults too.

The empirical approach used in this study has some limitations. First, statistical identification of a causal relation is challenging. As it is often the case, exogenous sources of variation are scarce and it is difficult to isolate the direction of causality. However, the individually-based evidence is reassuring: the use of lags in longitudinal data analysis suggests that past changes in social capital moderate the relationship between the variables of interest at later points in time. Moreover, the results obtained using the method of generated instruments lend some support to a causal interpretation of our findings. A second limitation relates to the use of large samples, which comes at the expense of not having a rich battery of questions to measure social capital.

However, the robustness of our results across different data-sets and measures of the variables of interest is promising. These findings provide encouraging news about the possibility of increasing happiness. People are not doomed to play a zero-sum game of comparisons. The role of social capital in shaping social comparisons points to strong social relations as an effective cure for them. Policies to enhance social capital could provide a viable path to diminish social comparisons and thereby promote overall well-being. Such policies are relatively inexpensive to implement and may ultimately improve public budgets. Lower social comparisons and greater social capital are expected to reduce morbidity, and therefore public spending on healthcare (Hawkley and Cacioppo 2010, Kawachi et al. 1997). Policies for social capital developed as a consequence of the increasing awareness of the importance of social capital for happiness, health, social cohesion, resilience and economic prosperity. We suggest that these policies are important to limit social comparisons as well.

Methodological aspects

German Socio-Economic Panel (SOEP)

- We use German Socio-Economic Panel data covering period 1985-2011. The sample consists of 12 waves for a total of about 40,000 individuals interviewed at least two times, giving more than 158,000 observations. Table A.3 in the Online Appendix provides detailed descriptive statistics. The sample used for the test with lagged values includes only individuals observed in two subsequent waves. In this case the sample consists of about 118,000 observations.
- Key variables:

- *Life satisfaction:* "Please answer on a scale from 0 to 10, where 0 means `completely dissatisfied' and 10 means `completely satisfied: How satisfied are you with your life, all things considered?"
- *Social capital index*: the index is defined as the sum of four dummy variables: "Attending social gatherings", "Helping friends", "Performing volunteering work", and "Participation in local politics" (each dummy is set to one if the respondent carries out a given activity at least once per month, zero otherwise). Thus, the social capital index ranges from zero (for individuals not performing any of the activities), to four (for people who perform all four activities).
- *Social capital index: negative change.* This dummy variable takes the value one if social capital index decreased between two subsequent waves.
- *Social capital index: no change.* This dummy variable takes the value one if social capital index has remained stable between two subsequent waves.
- *Social capital index: positive change.* This dummy variable takes the value one if social capital index increased between two subsequent waves.
- *Absolute income:* income is defined as monthly equivalised disposable income and is adjusted by the price level in a given year (transformed in logarithm).
- *Reference income*. Reference income is computed as the average *individual income* (in logarithmic form) of the reference group. We assume that respondents compare their incomes with those of other people of the same sex, age group and living in the same geographical area (West or East Germany) in the same year. In total we have 210 reference groups (ten reference groups per year for the three waves before unification (which do not include East Germany), and twenty reference groups per year for the nine waves after unification). The average number of respondents per reference group is 755.

- Methods:
  - We regress life satisfaction on a set of control variables using fixed-effects ordinary least squares with interaction terms to account for time invariant unobserved heterogeneity. Formally, we estimate the following equation:

$$\begin{aligned} LS_{i,t} = \ & \alpha + \beta_1 * \log(Abs\ income_{i,t}) + \beta_2 * \log(Ref\ income_{i,t}) + \\ & \beta_3 * SC\ index_{i,t} + \beta_{13} * \text{SC index}_{i,t} * \log(Abs\ income_{i,t}) + \beta_{23} * \\ & \text{SC index}_{i,t} * \log(Ref\ income_{i,t}) + \boldsymbol{\gamma}'\boldsymbol{X_{i,t}} + f_i + \varepsilon_{i,t} \end{aligned} \tag{1}$$

Where *LS* stands for life satisfaction of individual *i* at time *t*, *Abs income* is the deflated monthly equivalized disposable income, *Ref income* stands for reference income, and the vector of controls **X** includes socio-demographic characteristics as well as year and regional fixed effects. Estimates make use of robust standard errors.

- To check the robustness of the results, we estimate a slightly modified version of equation 4, where the four dummies measuring people's social interactions replace the index of social capital (see table A.2 in Online Appendix).

- Given the panel structure of the SOEP, we can test the hypothesis that positive (negative) changes in social capital from year *t-1* to *t* are associated with smaller (larger) coefficients of absolute and reference income for life satisfaction in year *t* (see table A.4 in the Online Appendix). Thus, we replace the index of social capital in equation 1 with the changes of social capital index between *t-1* and *t*. Formally, we estimate the following equation using fixed effects ordinary least squares with interaction terms:

$$\begin{aligned} LS_{i,t} = \ \alpha + \ \beta_1 * \log\left(Abs\ income_{i,t}\right) + \ \beta_2 * \log\left(Ref\ income_{i,t}\right) + \\ \beta_3 * \Delta SC\ index_{i,t} + \ \beta_{13} * \ \Delta\mathrm{SC\ index}_{i,t} * \log\left(Abs\ income_{i,t}\right) + \\ \beta_{23} * \ \Delta\mathrm{SC\ index}_{i,t} * \log\left(Ref\ income_{i,t}\right) + \ \boldsymbol{\gamma}'\boldsymbol{X_{i,t}} + f_i + \ \varepsilon_{i,t} \end{aligned} \tag{2}$$

where $\Delta\mathrm{SC\ index}_{i,t}$ stands for the changes of the index of social capital at time *t* with respect to time *t-1* for individual *i*. For ease of interpretations, we split $\Delta\mathrm{SC\ index}_{i,t}$ into two dummy variables, one for positive and one for negative changes of the index (the reference category is no changes). We run various specifications of equation 2 in which we include the change of social capital index with respect to *t-1*, *t-2* and *t-3*. Results are robust to these alternative specifications.

European Union - Survey on Income and Living Conditions (EU-SILC) (2013)

- The EU-SILC (2013) sample includes approximately 319,000 observations coming from 29 European countries (Table A.8 in the Online Appendix provides detailed descriptive statistics). A sub-sample of workers is used for the job satisfaction analysis and is composed of about 152,000 individuals.
- Key variables:

- *Life satisfaction:* "Overall, how satisfied are you with your life these days? Please answer on a scale of 0 to 10, where 0 means 'Not at all satisfied' and 10 means 'Completely satisfied'."
- *Frequency of feeling downhearted or depressed:* "How much of the time over the past four weeks have you been downhearted and depressed? Please answer on a scale from 1 to 5, where 1 means 'All of the time' and 5 means 'None of the time'." The scale has been inverted, i.e. 5 = 'All of the time' and 1 = 'None of the time".
- *Job satisfaction:* "Overall, how satisfied are you with your present work? Please answer on a scale of 0 to 10, where 0 means 'Not at all satisfied' and 10 means 'Completely satisfied'."
- *Social capital index:* The index is built using the answers to two measures of social capital: trust in others and frequency of meeting friends. The trust question asks: "Would you say that most people can be trusted? Please answer on a scale from 0 to 10, where 0 means that in general `You do not trust any other person' and 10 that you feel `Most people can be trusted'." We construct a dummy variable equal to one for answers larger than five, the median value, zero otherwise. The frequency of meeting with friends is based on the answers to the following question: "Do you meet up with friends/family for a drink/meal (at home or outside) at least once a month? (Yes/No)". We construct a dummy variable equal to one if an individual meets his friends or family at least once per month, zero otherwise. The social capital index simply adds up the two dummies. Hence, the index is a categorical variable taking values from zero to two, where higher values stand for more social capital.
- *Individual income:* it is the monthly disposable equivalised income adjusted to purchasing power parities by country. The equivalised disposable income is the total income of a household, after tax and other deductions, that is available for spending or saving, divided by the number of equivalent adults. Household members are made equivalent by weighting each of them using the so-called modified OECD equivalence scale (1.0 to the first adult; 0.5 to the second and each subsequent person aged 14 and over; 0.3 to each child aged under 14). To correct for purchasing power parities we use price level indices for the actual individual consumption (EU28=100) from Eurostat.
- *Reference income:* Reference income is computed as the average individual income of the reference group. We assume that respondents compare their incomes with those of other people of the same sex and age group living in the same region for a total of 990 reference groups (five age groups (under 26, 26-35, 36-45, 46-55, 55 and more) by two genders by 99 regions equals 990). The average number of individuals in a reference group is about 312.

- Aggregated variables (used in the macro analysis – tables 4 and 5, and figures 3, 4 and 5):
  - *Share of people with SC index = 2*: share of respondents with a social capital index equal to two.
  - *Life Satisfaction gap rich/poor*: The gap is the difference in the weighted average of *life satisfaction* between the first and fifth quintile of the *individual income* distribution by country/region.
  - *Gini index* (for countries): Gini coefficient of equivalised disposable income. EU-SILC data, Eurostat.
  - *Gini index* (for regions): Gini coefficient of weighted *individual income* by region computed using EU-SILC 2013 micro data.
  - *Gross Domestic Product (GDP) per capita:* GDP per capita in thousands of current euro corrected for purchasing power parity). Country/regional data from Eurostat for "Gross domestic product at market prices".
- Methods:
- For all measures of subjective well-being (life satisfaction, feeling depressed, and job satisfaction) we run an ordinary least square regression with interaction terms. The model is as follows:

$$SWB_i = \alpha + \beta_1 * \log(Abs\ income_i) + \beta_2 * \log(Ref\ income_i) + \beta_3 * SC\ index_i + \beta_{13} * \text{SC index}_i * \log(Abs\ income_i) + \beta_{23} * \text{SC index}_i * \log(Ref\ income_i) + \boldsymbol{\gamma}'\boldsymbol{X_i} + \varepsilon_i \quad (3)$$

where SWB stands for subjective well-being as proxied by life satisfaction, feeling depressed, and job satisfaction; *Abs* and *Ref income* stand for absolute and reference income, respectively; SC index is a categorical variable where higher values indicate a higher level of social capital; **X** is a vector of control variables including: age, gender, marital status, education level, occupation, home ownership, and country dummies; and ε is the error term. The subscript *i* stands for individuals. Interaction terms indicate whether the impact of individual and reference income on life satisfaction changes with the level of social capital. For ease of interpretation of the results, and in particular of interaction effects, we estimate equation 1 using ordinary least squares, thus treating subjective well-being as a cardinal variable. Estimates make use of robust standard errors.

- To check the robustness of the results, we estimate a slightly modified version of equation 1, where trust in others and the frequency of meeting friends replace the index of social capital

(see table A.6 in Online Appendix). Results are robust to the different specification and they are available upon request from the authors.

- We use two-stage least squares (2SLS) to instrument the main effect of social capital and its interaction term (see table A.2 and table A.7 in the Online Appendix). This test allows us to account for possible endogeneity issues. Identifying a proper instrument for social capital is not trivial, as most of the factors affecting people's social life will likely affect their well-being as well. To overcome this problem we use the method of generated instruments (Lewbel, 2012). In the first stage, we regress each of the endogenous variables on the vector of controls from equation 1:

$$Endogenous\ Variable_i = \alpha + \boldsymbol{B}'\boldsymbol{X_i} + \varepsilon_i \quad (4)$$

The Breusch-Pagan test suggests that we can reject the null hypothesis that the variance of the error term is constant, a crucial assumption to apply Lewbel's approach. Therefore, we generate the instruments by multiplying the residuals from equation 2 with each of the control variables in mean-centered form:

$$Z_j = \left(X_j - \bar{X}_j\right) * \hat{\epsilon} \quad (5)$$

Where *j* corresponds to a given control variable from vector **X, and** $\hat{\epsilon}$ is the vector of residuals from the first-stage regression of each endogenous variable on all controls from **X**. For each endogenous variable the number of generated instruments *Z* is therefore equal to the number of controls in vector **X**. The instruments are subsequently used in a standard 2SLS framework.

- In the macro analysis, we regress the proxy of subjective well-being on GDP per capita and the Gini index of income using ordinary least squares with robust standard errors. Our unit of analysis are countries. Formally we estimate the following model:

$$\Delta LS_c = \alpha + \beta_1 * \log(GDP\ per\ capita_c) + \beta_2 * \mathrm{Gini}_c + \varepsilon_c \quad (6)$$

European Social Survey (ESS, 2012)

- The 6th Round of the European Social Survey (2012) includes about 35,000 individuals from 25 European countries. We excluded Israel, Russia, Ukraine and Kosovo because Eurostat purchasing power parities data are not available for these countries. Table A.14 in the Online Appendix provides detailed descriptive statistics.

- Key variables:

  - *Life satisfaction:* “All things considered, how satisfied are you with your life as a whole nowadays? Please answer using this card, where 0 means `extremely dissatisfied' and 10 means `extremely satisfied'.”

  - *Happiness*. “Taking all things together, how happy would you say you are? 0 Extremely unhappy, 10 Extremely happy”.

  - *Happy, past week:* “I will now read out a list of the ways you might have felt or behaved during the past week. Using this card, please tell me how much of the time during the past week you were happy? 1 None or almost none of the time; 2 Some of the time; 3 Most of the time; 4 All or almost all of the time”.

  - *Social capital index*: we employ similar proxies of social capital to those used in the analysis of EU-SILC data. The answers to the question "How often do you meet socially with friends, relatives or work colleagues?" are recoded in a dummy variable set to one if a respondent meets socially at least once per week. As for trust in others, the ESS provides three questions that provide an overall evaluation of how much respondents trust others. The wordings are: "Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?"; "Do you think that most people would try to take advantage of you if they got the chance, or would they try to be fair?"; and "Would you say that most of the time people try to be helpful or that they are mostly looking out for themselves?". Answers range on a scale from zero to ten, in which higher scores indicate higher levels of perceived trustworthiness, fairness, and helpfulness. After factor analysis, we compute a synthetic index of social trust by averaging the answers to each question. Subsequently, we create a dummy variable (labeled “social trust”) set equal to one if the synthetic index ranges between 6 and 10, zero otherwise. Finally, we create the index of social capital as the sum of the two dummies. The index takes values from the set {0, 1, 2} where higher values indicate more social capital.

  - *Income rank*: The ESS questionnaire asks the respondent to choose the interval corresponding to his or her household's total income. There are ten intervals which are country specific and delimited by income deciles. Hence, our measure of relative income in this case is the *income rank*, i.e. the individual’s position in the national income distribution. *Income rank* is a categorical variable and, for the sake of simplicity when used with interactions, it has three

levels: *income rank 1-3* (for the bottom three deciles), *income rank 4-7* (for the middle four deciles), and *income rank 8-10* (for the top three deciles).

- *Household income*: we impute the disposable household monthly income by attributing to each respondent the average household income of the income bracket to which he/she declares they belong to (the original variable is the same used for *income rank*). In the case of non-Euro countries we convert the new variable to euros. Subsequently, we adjust for purchasing power parity (PPP) using the conversion factor provided by Eurostat (EU28=100).

- Aggregated variables (used in the macro analysis):

- *Share of people with SC index = 2: share of respondents with a social capital index equal to two.*

Method:

- We regress the three proxies of subjective well-being on a set of control variables using ordinary least squares with interaction terms. Formally we estimate the same model of equation 3.
- In the macro analysis, we regress the proxy of subjective well-being on GDP per capita and the Gini index of income using ordinary least squares with robust standard errors. Our unit of analysis are countries. Formally we estimate the following model:

$$\Delta LS_c = \alpha + \beta_1 * \log(GDP\ per\ capita_c) + \beta_2 * \text{Gini}_c + \varepsilon_c \quad (7)$$

REFERENCES

Algan, Yann, Pierre Cahuc, and Andrei Shleifer. "Teaching practices and social capital." *American Economic Journal: Applied Economics* 5.3 (2013): 189-210.

Bartolini, Stefano, and Francesco Sarracino. "The dark side of Chinese growth: Declining social capital and well-being in times of economic boom." *World Development* 74 (2015): 333-351.

Berguno, George, et al. "Children's experience of loneliness at school and its relation to bullying and the quality of teacher interventions." *The Qualitative Report* 9.3 (2004): 483-499.

Biswas-Diener, Robert. "Manipulating happiness: Maria Montessori." *International Journal of Wellbeing* 1.2 (2011).

Blanchflower, David G., and Andrew J. Oswald. "Well-being over time in Britain and the USA." *Journal of public economics*88.7-8 (2004): 1359-1386.

Bowles, Samuel, and Yongjin Park. "Emulation, inequality, and work hours: Was Thorsten Veblen right?." *The Economic Journal* 115.507 (2005): F397-F412.

Brockmann, Hilke, et al. "The China puzzle: Falling happiness in a rising economy." *Journal of Happiness Studies* 10.4 (2009): 387-405.

Brulé, Gaël, and Ruut Veenhoven. "Participatory teaching and happiness in developed nations." *Advances in Applied Sociology* 4 (2014): 235-245..

Buijzen, Moniek, and Patti M. Valkenburg. "The unintended effects of television advertising: A parent-child survey." *Communication Research* 30.5 (2003): 483-503.

Caron, André H., and Jennie M. Hwang. "Analysis of Children's Television Characters and Media Policies." *Handbook of Child Well-Being*. Springer, Dordrecht, 2014. 1957-1977.

Cheung, Felix, and Richard E. Lucas. "Income inequality is associated with stronger social comparison effects: The effect of relative income on life satisfaction." *Journal of personality and social psychology* 110.2 (2016): 332.

Clark, Andrew E., and Claudia Senik. "Who compares to whom? The anatomy of income comparisons in Europe." *The Economic Journal* 120.544 (2010): 573-594.

Cohen, P., and Cohen, J. *Life values and adolescent mental health,* Erlbaum, 1996.

Diener E., Oishi S. and Tay L. "Advances in subjective well-being research", *Nature Human Behavior*, 2 (2018): 260.

Duriez, Bart, et al. "The social costs of extrinsic relative to intrinsic goal pursuits: Their relation with social dominance and racial and ethnic prejudice." *Journal of personality* 75.4 (2007): 757-782.

Easterlin, Richard A., and Eileen M. Crimmins. "Private materialism, personal self-fulfillment, family life, and public interest THE nature, effects, and causes of recent changes in the values of American youth." *Public Opinion Quarterly* 55.4 (1991): 499-533.

Easterlin, Richard A. "Does economic growth improve the human lot? Some empirical evidence." *Nations and households in economic growth*. 1974. 89-125.

Easterlin, Richard A., et al. "The happiness–income paradox revisited." *Proceedings of the National Academy of Sciences*(2010): 201015962.

Festinger, Leon. "A theory of social comparison processes." *Human relations* 7.2 (1954): 117-140.

Fliessbach, Klaus, et al. "Social comparison affects reward-related brain activity in the human ventral striatum." S*cience* 318.5854 (2007): 1305-1308.

Friehe, Tim, Mario Mechtel, and Markus Pannenberg. "Positional income concerns: prevalence and relationship with personality and economic preferences." (2014).

Gaster, Sanford. "Urban children's access to their neighborhood: Changes over three generations." *Environment and behavior* 23.1 (1991): 70-85.

Gold, Brian T. "Enviousness and its relationship to maladjustment and psychopathology." *Personality and Individual Differences* 21.3 (1996): 311-321.

Goldberg, Marvin E., and Gerald J. Gorn. "Some unintended consequences of TV advertising to children." *Journal of Consumer Research* 5.1 (1978): 22-29.

Graham, Carol, and Sergio Pinto. "Unequal hopes and lives in the USA: Optimism, race, place, and premature mortality." *Journal of Population Economics* (2018): 1-69.

Hawkley, Louise C., and John T. Cacioppo. "Loneliness matters: a theoretical and empirical review of consequences and mechanisms." *Annals of behavioral medicine* 40.2 (2010): 218-227.

Helliwell, John F., Haifang Huang, and Shun Wang. "*New evidence on trust and well-being*". No. w22450. National Bureau of Economic Research, 2016.

Helliwell, John F., and Lara B. Aknin. "Expanding the social science of happiness." *Nature Human Behaviour* (2018): 1.

Hillman, Mayer, John Adams, and John Whitelegg. "One false move." *London: Policy Studies Institute* (1990).

Hirsch, Fred. *Social limits to growth*, Harvard University Press, 1976.

Hopper, Lydia M., et al. "Social comparison mediates chimpanzees' responses to loss, not frustration." *Animal cognition* 17.6 (2014): 1303-1311.

Kasser, Tim. *The high price of materialism*. MIT press, 2002

Kasser, Tim. "Frugality, generosity, and materialism in children and adolescents." *What do children need to flourish?*. Springer, Boston, MA, 2005. 357-373.

Kasser, Tim, and Richard M. Ryan. "A dark side of the American dream: Correlates of financial success as a central life aspiration." *Journal of personality and social psychology* 65.2 (1993): 410.

Kawachi, Ichiro, et al. "Social capital, income inequality, and mortality." *American journal of public health* 87.9 (1997): 1491-1498.

Kim, Joongsub, and Rachel Kaplan. "Physical and psychological factors in sense of community: New urbanist Kentlands and nearby Orchard Village." *Environment and behavior* 36.3 (2004): 313-340.

Kondo, Naoki, et al. "Do social comparisons explain the association between income inequality and health?: Relative deprivation and perceived health among male and female Japanese individuals." *Social science & medicine* 67.6 (2008): 982-987.

Layard, Richard. *Happiness: Lessons from a new science*. Penguin UK, 2006.

Lewbel, Arthur. "Using heteroscedasticity to identify and estimate mismeasured and endogenous regressor models." *Journal of Business & Economic Statistics* 30.1 (2012): 67-80.

Lillard A. and Else-Quest N., "Evaluating Montessori Education." *Science* 313:5795 (2006): 1893-1894.

Lisosky, Joanne M. "For all kids' sakes: comparing children's television policy-making in Australia, Canada and the United States." *Media, culture & society* 23.6 (2001): 821-842.

Lund, Hollie. "Testing the claims of new urbanism: Local access, pedestrian travel, and neighboring behaviors." *Journal of the American Planning Association* 69.4 (2003): 414-429.

Luttmer, Erzo FP. "Neighbors as negatives: Relative earnings and well-being." *The Quarterly journal of economics* 120.3 (2005): 963-1002.

McDonald, Noreen C. "Active transportation to school: trends among US schoolchildren, 1969–2001." *American journal of preventive medicine* 32.6 (2007): 509-516.

McHoskey, John W. "Machiavellianism, intrinsic versus extrinsic goals, and social interest: A self-determination theory analysis." *Motivation and Emotion* 23.4 (1999): 267-283.

Mikucka, Malgorzata, Francesco Sarracino, and Joshua K. Dubrow. "When does economic growth improve life satisfaction? Multilevel analysis of the roles of social trust and income inequality in 46 countries, 1981–2012." *World Development* 93 (2017): 447-459.

Mujcic, Redzo, and Andrew J. Oswald. "Is envy harmful to a society's psychological health and wellbeing? A longitudinal study of 18,000 adults." *Social Science & Medicine* 198 (2018): 103-111.

Nairn, Agnes, Jo Ormrod, and Paul Andrew Bottomley. "Watching, wanting and wellbeing: Exploring the links-a study of 9 to 13 year-olds." (2007).

Neumark, D., and Postlewaite, "A. Relative income concerns and the rise in married women's employment." *Journal of public Economics*, 70(1) (1998): 157-183.

Pham-Kanter, Genevieve. "Social comparisons and health: Can having richer friends and neighbors make you sick?." *Social science & medicine* 69.3 (2009): 335-344.

Pinquart, Martin, and Silvia Sorensen. "Influences on loneliness in older adults: A meta-analysis." *Basic and applied social psychology* 23.4 (2001): 245-266.

Pollay, Richard W. "The distorted mirror: Reflections on the unintended consequences of advertising." *The Journal of Marketing* (1986): 18-36.

Putnam, Robert D. *Bowling alone: The collapse and revival of American community*. Simon and Schuster, 2001.

Rogers, Shannon H., et al. "Examining walkability and social capital as indicators of quality of life at the municipal and neighborhood scales." *Applied Research in Quality of Life* 6.2 (2011): 201-213.

Sarracino, Francesco. "Money, sociability and happiness: are developed countries doomed to social erosion and unhappiness?." *Social Indicators Research* 109.2 (2012): 135-188.

Sheldon, Kennon M., and Tim Kasser. "Getting older, getting better? Personal strivings and psychological maturity across the life span." *Developmental psychology* 37.4 (2001): 491.

Sheldon, Kennon M., Melanie Skaggs Sheldon, and Richard Osbaldiston. "Prosocial values and group assortation." *Human nature* 11.4 (2000): 387-404.

Schor, Juliet. *Born to buy: Marketing and the transformation of childhood and culture*. Scribner, 2004.

Smith, R. H., Parrott, W. G., Diener, E. F., Hoyle, R. H., & Kim, S. H. "Dispositional envy." *Personality and Social Psychology Bulletin* 25.8 (1999): 1007-1020.

Schmitt, Vanessa, et al. "Do monkeys compare themselves to others?." *Animal cognition* 19.2 (2016): 417-428.

Subramanyam, Malavika, et al. "Relative deprivation in income and self-rated health in the United States." *Social Science & Medicine* 69.3 (2009): 327-334.

Tang, Thomas Li-Ping, and Randy K. Chiu. "Income, money ethic, pay satisfaction, commitment, and unethical behavior: Is the love of money the root of evil for Hong Kong employees?." *Journal of business ethics* 46.1 (2003): 13-30.

Twenge, Jean M., and Tim Kasser. "Generational changes in materialism and work centrality, 1976-2007: Associations with temporal changes in societal insecurity and materialistic role modeling." *Personality and Social Psychology Bulletin* 39.7 (2013): 883-897.

Wilkinson, Richard, and Kate Pickett. *The spirit level: Why equality is better for everyone*. Penguin UK, 2010.

Wilkinson, Richard, and Kate Pickett. *The Inner Level: How More Equal Societies Reduce Stress, Restore Sanity and Improve Everyone's Well-being.* Allen Lane 2019

Luo, Zhitian. "10 The Rise of Materialism: A Trend in Tentieth-Century Chinese Culture." *Inheritance within Rupture*. BRILL, 2015. 353-387.