J Happiness Stud (2016) 17:2457–2479
DOI 10.1007/s10902-015-9702-0

RESEARCH PAPER

The Role of Social Ties in Explaining Heterogeneity in the Association Between Economic Growth and Subjective Well-Being

Petri Böckerman[1,2,3] · **Jani-Petri Laamanen**[4] · **Esa Palosaari**[4,5,6]

Published online: 12 December 2015

Abstract Whether economic growth improves subjective well-being has been under debate. Studies that find such an association also document heterogeneity between countries in the magnitude of the relationship. We test a theoretical model in which economic growth enhances subjective well-being only when a large share of the population derives their subjective well-being from relational goods with positive externalities instead of positional goods with negative externalities. The choice between relational and positional goods is determined by individuals' relational abilities and expectations which we operationalize as attachment security. We specifically test whether economic growth improves subjective well-being more in those countries where the average attachment security is higher. We find support for the hypothesis in the Eurobarometer data but less support in the World Values Survey data.

Keywords Economic growth · Subjective well-being · Easterlin paradox · Comparison income

JEL Classification O40 · I31 · E03

✉ Petri Böckerman
petri.bockerman@labour.fi

Jani-Petri Laamanen
jani-petri.laamanen@uta.fi

Esa Palosaari
esa.palosaari@aalto.fi

[1] Turku School of Economics, Turku, Finland

[2] Labour Institute for Economic Research, Helsinki, Finland

[3] IZA, Bonn, Germany

[4] University of Tampere, Tampere, Finland

[5] Aalto University, Helsinki, Finland

[6] HECER, Helsinki, Finland

1 Introduction

The goal for human endeavour is to have a happy or a satisfying life. Different means to achieve this goal have been analyzed in quantitative research by using representative data of people's self-reports to the question on subjective well-being (SWB), which can be defined as people's emotional and cognitive evaluation of their lives (Diener et al. 2003).[1] SWB is a useful goal for economic and social policy because it has the potential to capture both mental and social well-being in addition to physical well-being (for a contrary view, see Deaton 2008).

The association between SWB and economic growth has been under debate, with two contradictory views on the issue. Easterlin (1974) argued that aggregate economic growth does not improve the average SWB at the country level, although richer individuals have a higher SWB than poorer ones within countries. Stevenson and Wolfers (2008) challenged this received wisdom and argued, using new data and estimation methods, that aggregate economic growth is significantly and positively related to SWB, using both cross-sectional and panel data at the country level. Easterlin et al. (2010) disputed this and claimed specifically the lack of a long-run association between GDP and SWB. Easterlin et al. (2010) stressed that cross-sectional or short-run evidence of a positive GDP–SWB association (Deaton 2008) does not refute their original argument. Sacks and Wolfers (2010) presented evidence showing that the association is positive in the long run although not always statistically significant, and they noted that the absence of evidence of statistical significance does not necessary imply evidence of the absence of an association. The debate is unsettled (Graham et al. 2010).

Whether the association between economic growth and SWB is, in general, positive or non-existent, the relationship can still vary from one individual country to the next. In fact, countries seem to be puzzlingly heterogeneous, with Belgium, for example, showing a significant negative association between economic growth and SWB (Stevenson and Wolfers 2008). One possible reason for the apparent heterogeneity among countries is that the contribution of one major explanation for the Easterlin paradox, namely relative income concerns, varies from one country to another.[2]

According to the relative income hypothesis, the difference of one's own income level compared to others' affects decisions about consumption and saving (Alvarez-Cuadrado and Long 2011). The reason for this is that people derive utility from the difference between their own consumption and the consumption of others (Alvarez-Cuadrado and Long 2011). Therefore, the aggregate SWB of a group may not increase if the income of everybody increases—the rise in the absolute level of consumption may not have an effect on SWB if people care mostly about consumption relative to others. At the same time, the higher the consumption relative to others is, the higher is also SWB.

[1] We use "subjective well-being" as a concept which includes both "happiness" and "life satisfaction". Happiness and life satisfaction are somewhat distinct concepts and empirical counterparts of SWB and can have different correlates (Graham et al. 2010). We treat them separately in our empirical analysis although they are mostly not distinguished in the theoretical literature on the relationship between economic growth and SWB.

[2] Another possible explanation is adaptation to the consumption level over time. There is empirical evidence suggesting that relative income concerns have a larger effect (Layard et al. 2010). Increases in inequality associated with economic growth can also result in stagnant SWB if inequality decreases SWB. Country differences in the effects of adaptation or in inequality could therefore also explain the heterogeneity in the GDP–SWB association.

One class of goods whose consumption can affect utility because of the relative ranking of goods are positional goods (Alpizar et al. 2005). The importance of relative ranking or positionality of some goods can depend on social norms and subjective perceptions. For example, house and car ownership are typically seen as more positional than vacations and insurance (Alpizar et al. 2005).

Pugno (2009) has proposed a plausible theoretical model to explain individual and country-level differences in the effects of relative income and therefore also the heterogeneity in the association between economic growth and SWB. The model has two types of goods: positional and relational goods. One important factor in the model is relational ability, which affects the quality of social ties or relational goods that people produce. Relational goods can be defined as non-instrumental interpersonal relationships which can only be enjoyed in the company of other people (Gui 1996). Relational goods and their quality can be considered to be an aspect of many activities and relationships, such as marriages, political participation, and jobs, influencing their pleasantness, satisfaction and productivity (Uhlaner 1989). A related concept is social capital, which is argued to enter the production rather than the utility function, for example, by enabling lower-cost business transactions via building up trust (Gui 1996). Relational goods, in turn, can be considered to be goods which are enjoyed as ends in themselves or, in other words, to enter the utility function directly (Gui 1996). Consistent with these propositions, Bruni and Stanca (2008) find that participation in voluntary organizations and time spent with family and friends have a positive association with life satisfaction in the World Values Survey. Changes in relational goods, operationalized by Bartolini et al. (2009) as changes in group memberships, also predict country-level changes in SWB over a period of 15 years.

In Pugno's (2009) model, relational goods are produced with relational ability together with instrumental material consumption. In the theoretical model, relational ability and expectations about relationships based on early life experiences determine whether people orient themselves towards the consumption of market goods for comparative purposes (positional goods) or towards relational goods. People with stronger relational abilities and expectations consume more relational goods and less positional goods because they expect to derive more enjoyment from the relational goods although their knowledge of their own skills is limited (Pugno 2009). Income improves SWB because the production of relational goods has material inputs (e.g. going to a restaurant to meet friends). Furthermore, SWB derived from relational goods does not decrease the SWB of others but increases it: enjoyment is higher for all participants in the relationship if the relational goods have a higher quality. People can also derive SWB from the positional goods, which do not require relational ability (e.g. enjoyment from the high social status of the restaurant one is eating in). Increases in income and consumption of positional goods improve one's well-being only if they lead to a higher position in the hierarchy (e.g. the restaurant is considered to be of a higher social status than the rest of the restaurants where other people eat).[3] If everybody's consumption of positional goods increases by the same amount, there is no improvement in the net amount of well-being because only the position relative to other people matters, and not the absolute value of consumption. The crucial assumption in

[3] The model implicitly assumes that market goods can affect well-being only through relational goods or through consumption which has negative externalities via positional comparisons. There is no effect of the higher quantity or quality of market goods such as tastier meals, for example, outside these channels. If deviations from this assumption are important, and product quality and quantity have significant positive effects on well-being, we should not observe a lack of association between GDP and SWB. If the deviation is significant only below a certain level of consumption, this prediction should accordingly be valid only among countries below that level (Akay et al. 2012).

Pugno's (2009) model is that lower expected well-being from relational goods will lead to a higher consumption of positional goods. Because consuming positional goods is essentially a zero-sum game these populations will have a lower net gain from economic growth in terms of SWB.

The concept of relational ability and expectations about relational goods, that Pugno (2009) uses is based on the psychological concept of attachment style security, which he explicitly takes as a reference in his model. In large part, secure attachment style can be considered as a positive answer to the question "Can I trust my close relations to be available and responsive to my needs?" (Hazan and Shaver 1994). The attachment behavioural system's goal is to induce caregiving and protection by means of the attachment figure (Hilburn-Cobb 2004). It is the most important system for regulating relationships, behaviour, and internal states among infants and children, because their survival depends on specific others, but the system continues to function throughout the entire lifespan. According to the theory, if the answer is positive and close people can be counted on when needed, the question about the availability of close people will not bother the individual constantly and the individual is free to flexibly activate and develop other behavioural systems such as affiliation, caregiving, and exploration for better relationships and competence (Hilburn-Cobb 2004). Furthermore, close relationships will be considered as intrinsically satisfying and material goods as instrumental to these relationships. There is no need to try to shut down the attachment system by force, for example, by devaluing attachment relationships or to use other behavioural systems such as submission or dominance to achieve attachment goals. In contrast, if other people who are close cannot be trusted to be emotionally available and responsive, subordination-submission behavioural systems that have originally evolved for different purposes will be activated first in the service of attachment goals, and, if these attempts fail to get a favourable response, they will be used as replacements for attachment goals. The end result would be an instrumental and a hierarchical attitude towards human relationships which will carry on to adulthood (Hilburn-Cobb 2004). Empirically, persons with a secure attachment style tend to have better relational abilities (DiTommaso et al. 2003) and a better relationship quality (Noftle and Shaver 2006; Towler and Stuhlmacher 2013) than persons with insecure attachment styles. Empirical evidence also supports the conclusion that lower attachment security is associated with a higher concern for status: attachment insecurity is associated with preferences for outcomes which are worse in absolute terms but better relative to other persons (Van Lange et al. 1997). Low rank in status hierarchies also leads to more depression and anxiety among insecurely attached persons than among securely attached persons (Irons and Gilbert 2005). In our empirical study, we use the country averages of attachment security as the indicators of average relational ability, relational goods quality, and orientation towards relational goods instead of positional goods. Since consuming positional goods is a zero-sum game whereas consuming relational goods is not, countries with a more insecure (secure) average attachment style should have a less (more) positive association between economic growth and SWB.

The contribution of this paper to the debate is to shed new light on the heterogeneity of the association between GDP growth and SWB. We test whether economic growth improves SWB more in countries with a higher quality of social ties or relational goods. The analyses can potentially help in determining which countries benefit most from economic growth in terms of SWB and, if the tested model stands empirical scrutiny, it can provide some tools to increase SWB at the country level. Lack of confirmation of the hypothesis would also be useful by helping to rule out one possible explanation for the variation in the GDP–SWB association between countries. To accomplish this, we use the

Eurobarometer and World Values Survey data sets and estimation methods adopted earlier by Stevenson and Wolfers (2008) and consider the country average of attachment security as a moderator of the association.

The paper is structured as follows. Section 2 provides a brief overview of the earlier empirical literature and theoretical motivation for our empirical analysis. Section 3 describes data and estimation methods. Section 4 presents the estimation results and the conclusions are provided in Sect. 5.

2 Background

2.1 Heterogeneity in the Income–SWB Association

The most influential challenge to the Easterlin paradox (1974) has come from Stevenson and Wolfers (2008). They used the logarithm of GDP per capita as the measure of income and reported a positive association between income and SWB over time in some model specifications using the Eurobarometer Survey and the World Values Survey (WVS). Stevenson and Wolfers (2008) also found considerable heterogeneity among countries in the association between GDP growth and change in SWB: some countries have statistically non-significant and flat slopes, others significant and steep slopes, and Belgium even has a significant negative correlation between GDP and SWB. Using the same data, Krueger (2008) also noted that there is significant variation across countries. Restricting the effects of log GDP on satisfaction to be the same across all countries in the WVS data produced a significant and positive estimate but an F-test revealed the model to be overly restrictive with log GDP interactions with the country fixed effects being highly statistically significant. When Krueger (2008) estimated separate coefficients for each country, the effect of GDP on satisfaction for average country was negative and non-significant. He considered these country differences in the GDP–SWB association to be a puzzle and encouraged researchers to explain the reasons for these differences.

Previous studies have identified some potential factors contributing to the heterogeneous effects of rising income on SWB. Rojas (2007) found that, in Mexico, the logarithm of personal income predicted self-reported happiness statistically significantly only among persons with conceptual referents for happiness with an outer orientation, but not among persons with an inner orientation. del Salinas-Jiménez et al. (2010) analyzed the WVS data and discovered that income was significantly and positively associated with life satisfaction only among those with extrinsic or mixed motivations, and that intrinsic motivation predicted life satisfaction among individuals in low- and middle-income groups, but not among those with a high income. The results suggest that the country-level differences in conceptual referents for happiness could also explain the country-level differences in the association between economic growth and SWB, and general cultural differences explain a part of the heterogeneity. Borrero et al. (2013) found that the association between GDP and SWB was stronger among individualistic than among collectivistic cultures.

A popular explanation of the Easterlin paradox is that people have positional income terms in their utility functions (Clark et al. 2008). If a person's own and comparison income affect SWB equally but in opposite directions, then increases in the population's average income do not improve the average level of SWB. The negative effects of others' income increases cancel out the positive effects of one's own income increases on SWB. Possible differences in positional income concerns across countries could therefore also

explain heterogeneity in the association between economic growth and subsequent change in SWB. There is evidence that increases in one's own income improve SWB but increases in the average income of the reference group decrease SWB (Ferrer-i-Carbonell 2005). More precisely, there is evidence that rather than the reference income it is one's position or rank income in the comparison group that affects life satisfaction (Boyce et al. 2010). However, contrary to other literature, Deaton and Stone (2013) find that in the Gallup data there are sizeable effects of relative income on happiness (affective evaluations of SWB) but not on life satisfaction (cognitive evaluations of SWB). Deaton and Stone (2013) suggest that happiness may be associated with transitory income whereas life satisfaction may be correlated with permanent income.

Proto and Rustichini (2013) categorized people into income percentiles and found that the association between GDP and life satisfaction flattens after a peak and eventually becomes slightly but significantly negative. They hypothesized that this results from a higher income level leading to higher aspirations. Supporting this explanation, Proto and Rustichini (2013) argued that the aspiration level can be considered to be the same as comparison income and they showed that its negative effect on SWB is stronger among persons who are more sensitive to losses, which they measured with the personality trait of neuroticism.

In addition to these individual-level differences, country-level differences have also been observed. Corazzini et al. (2012) found that relative income concerns were stronger in countries that were wealthier and that had a Protestant–Calvinistic religion as its dominant one, a more equal income distribution, and a larger government. Georgellis et al. (2009) discovered that the association between life satisfaction and reference income depended on personal values in the European Social Survey, but this moderation by values also varied among countries. For example, the reference income had a more negative association with life satisfaction among regular churchgoers compared to those who do not attend church services, but this association was observed only in Southern Europe. In Western Europe, the estimates had the opposite sign. Similarly, valuing helping and caring for others predicted a positive association between life satisfaction and reference income in Western Europe, but there was no significant association in the Nordic countries.

2.2 Hypothesis

Pugno (2009) presented a comprehensive theoretical framework that explains the differences across countries in how income gains are converted into improvements in SWB. It integrates empirical findings regarding positional income and relational goods with a psychological theory about individual differences in preferences about them. The theoretical model predicts that economic growth improves SWB only when a large fraction of the population has a high relational ability (which can be operationalized as secure attachment style, see Introduction; also Fraley and Shaver 2000) because they derive their SWB more from mutually beneficial relationships or relational goods rather than from zero-sum comparisons of income (Van Lange et al. 1997). Correspondingly, if the relational abilities are low and people derive their SWB mainly from comparison income, then GPD gains are lost in a hedonic treadmill without improving the population's SWB.

Expressing these ideas more formally, Pugno's (2009) model assumes the following adult's expected utility function referring to well-being:

$$U^e = U\left[\frac{c}{z}, R^e, H\right] \quad (1)$$

where c denotes consumption of positional goods, which is related to consumption by others z. R^e denotes the expected quality of relational goods and H denotes leisure time. R^e in turn has the following production function:

$$R^e = R\left[h^e, C\right] \quad (2)$$

where h^e denotes the human contribution to the quality of relational goods and C denotes consumption or the material component instrumental to relational goods. We assume that h^e is measured by attachment security. In the model, the expectations of the human contribution h^e are influenced by the relational ability of the individual's parent when the individual was young, as suggested by the attachment theory.

According to the model, economic growth can have a positive net effect on the whole group's SWB if an increase in income leads to an increase in the consumption of the material component C of the relational goods R^e. However, if the expected human contribution to the relational goods h^e is of sufficiently poor quality, all consumption will consist of positional goods c with no net positive effect of economic growth on the population's well-being.

The hypothesis that we test in our empirical study is therefore whether economic growth using GDP per capita is associated with larger improvements in SWB in countries where the population has, on average, a more secure attachment style indicating a higher quality human contribution to relational goods.

3 Data and Method

We use the same happiness and life satisfaction (the Eurobarometer Survey and the World Values Survey, WVS) and GDP data and Stata codes as Stevenson and Wolfers (2008) that are provided on a website (http://users.nber.org/~jwolfers/data.php). The Eurobarometer data cover the European Community (EC) and the later European Union (EU) countries from the expansion in 2004. Countries have been added to the original nine countries as the EC and the EU have expanded. The data cover the period 1970–2007 and they include questions about life satisfaction at least annually, but questions about happiness have been less frequent. The WVS data that Stevenson and Wolfers (2008) used cover four waves (1981–1984, 1989–1993, 1994–1999, 1999–2004), which included a varying number of countries (10–62) and participants (12,021–60,627) in each wave. We kept the original four waves in order to replicate the results by Stevenson and Wolfers (2008), but we also added the fifth wave (2005–2009) of the WVS data to our analysis. To these data we linked the country averages of attachment security, as reported in Schmitt et al. (2004). The attachment data were collected as part of the International Sexuality Description Project, and they include 17,804 participants from 56 countries. Most samples are comprised of college students. The attachment security data is cross-sectional from the early 2000s. Schmitt et al. (2004) report some cross-country comparisons that are according to theoretical predictions; for example, the countries with lower levels of human development tend to have higher levels of various types of insecure attachment styles. Therefore, it has validity as a measure for cross-country analyses.[4]

[4] A problem in using psychological survey measures in cross-country analyses is that people tend to evaluate themselves in comparison to the averages of the country they live in (Heine et al. 2008). This makes it more difficult to find statistically significant relationships across countries.

Attachment security was measured by means of the Relationship Questionnaire (Bartholomew and Horowitz 1991). The item concerning secure attachment was this: "It is easy for me to become emotionally close to others. I am comfortable depending on others and having others depend on me. I don't worry about being alone or having others not accept me." The participants indicated on a 7-point Likert scale how well the item described them (1 = 'doesn't describe me', 7 = 'very accurately describes me'). Z-scores of the country-level averages were used in all analyses.

Happiness is measured in the WVS by means of the question: "Taking all things together, would you say you are: 'very happy,' 'quite happy,' 'not very happy,' [or] 'not at all happy?'" Happiness in the Eurobarometer survey is measured by means of the question: "Taking all things together would you say you are: 'very happy,' 'quite happy,' 'not very happy,' [or] 'not at all happy?'".

Life satisfaction is measured in the WVS by means of the question: "All things considered, how satisfied are you with your life as a whole these days?" Life satisfaction is measured on a scale from 1 to 10 with a higher value meaning that a person is more satisfied with his/her life. In the Eurobarometer Survey, the life satisfaction question is formulated as, "On the whole, are you very satisfied, fairly satisfied, not very satisfied or not at all satisfied with the life you lead?"

GDP The Stevenson and Wolfers (2008, 2013) data that we use is the real GDP per capita measured at purchasing power parity. The data are mostly taken from the World Bank's World Development Indicators database. Where there are missing observations in the World Bank's database, GDP data is added from the Penn World Tables (version 6.2) or the CIA Factbook. The natural logarithm of average income is used in all analyses.

We apply two approaches to test our hypothesis. First, we added a log GDP × Attachment security interaction term to the Stevenson and Wolfers' (2008) OLS models, where the logarithm of GDP per capita is used to explain SWB. A positive and significant coefficient for this interaction term implies that the association between GDP and SWB depends on a country's average attachment security, according to the theoretical model by Pugno (2009). Second, we divided countries into three groups according to their average attachment security: countries in the lowest quartile, countries in the middle two quartiles, and countries in the highest quartile. Support for our hypothesis would be shown as a non-significant or negative association between GDP and SWB in the lowest quartile and statistically significant and positive associations in the middle and highest quartile.

4 Results

To give a first glimpse of the association that we are examining, we plotted the estimated logarithmic GDP per capita–life satisfaction gradients against the average level of attachment security in Fig. 1. The figure is based on the Eurobarometer data in the original 1973 sample of nine countries analyzed by Easterlin (1995) and Stevenson and Wolfers (2008), seven for which we have data on attachment security (Belgium, Greece, France, Italy, the Netherlands, the United Kingdom, and Germany). We find that countries with a higher average of attachment security have higher GDP–life satisfaction gradients. The observation in the bottom left of the figure is Belgium, the country for which Stevenson and Wolfers (2008) found a negative GDP–SWB gradient. Belgium has the second lowest average attachment security in the sample containing all countries. It is a possible explanation for the exceptional gradient.

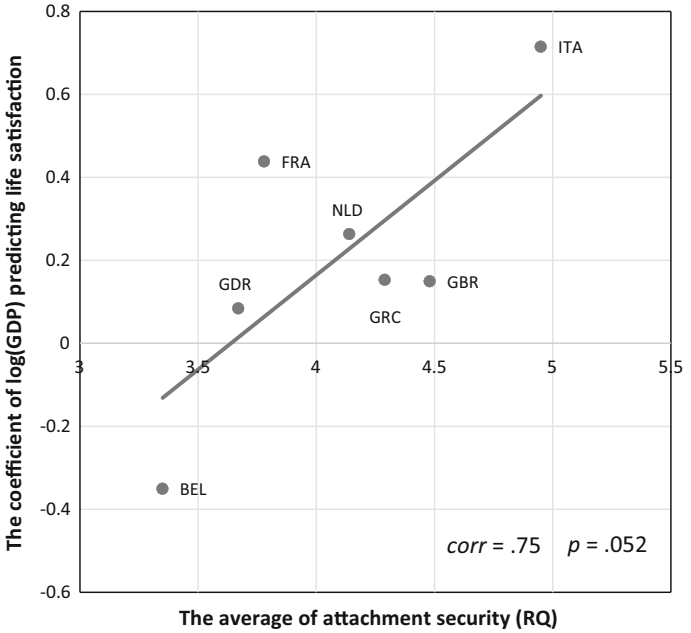

Fig. 1 GDP–life satisfaction gradients using the Eurobarometer survey and the country averages of secure attachment (Schmitt et al. 2004)

Next we turn to the formal econometric analyses of the role of attachment security in determining how SWB is linked to GDP. To set the stage, we present the estimates from specifications similar to Stevenson and Wolfers (2008) in the leftmost and centre columns of Tables 1 and 2, essentially replicating their estimates. The estimated equation in levels is

$$SWB_{it} = \alpha_0 + \alpha_1 \ln GDP_{it} + \varepsilon_{it} \tag{3}$$

where SWB_{it} is the aggregate SWB, and GDP_{it} is the real gross domestic product per capita for country i and survey wave t. Well-being is aggregated by running an individual-level ordered probit regression of SWB measure on country-wave interaction dummies. The estimated coefficients on the dummies are the ordered probit index values for the country-time pairs. Following Stevenson and Wolfers (2008) the ordered probit index variable is used because SWB measures in the data set are ordinal.

In addition to estimating the pooled model, in which both cross-country and time variation is included, we also add the country and wave fixed effects in the subsequent specifications. The country fixed effects account for unobserved differences between countries that are stable over time. The wave fixed effects are included to capture both aggregate shocks facing all countries simultaneously and differences between waves in the surveys. To see how shorter- and longer-run changes in GDP are associated with changes in well-being, the model is also estimated in short first differences and long first differ-

Table 1 Regressions of SWB on the Logarithm of GDP per Capita and (normalized) Attachment Security: Eurobarometer Survey

Dependent variable and specification	n[a]	lnGDP[b]	n[c] cty wav	lnGDP[d]	lnGDP[e]	Attach[f]	Attach × lnGDP[g]	ΔR^{2h}
Life satisfaction, 1973–2007								
Levels	776	0.768***	488	0.782**	0.767**	−0.048	0.084	.01
		(0.177)	21	(0.192)	(0.199)	(0.066)	(0.148)	
			5–55					
Levels with country fixed effects	776	0.193**	488	0.232′	0.229*		0.222**	.01
		(0.059)	21	(0.127)	(0.082)		(0.068)	
			5–55					
Levels with country and wave fixed effects	776	0.193*	488	0.768*	0.494		0.207**	.01
		(0.094)	21	(0.330)	(0.347)		(0.072)	
			5–55					
Short first differences[i]	77	0.580**	47	1.387***	1.314***		0.155	.02
		(0.181)	10	(0.321)	(0.325)		(0.147)	
			1–7					
Long first differences[j]	37	0.336	23	1.456*	1.162*		0.248′	.12
		(0.231)	10	(0.549)	(0.535)		(0.126)	
			1–3					
Happiness, 1975–1986								
Levels	139	0.444	83	1.705*	1.376′	−0.071	−0.014	.10
		(0.489)	8	(0.662)	(0.690)	(0.128)	(0.010)	
			3–14					
Levels with country fixed effects	139	0.624′	83	0.640	0.564*		0.827**	.02
		(0.345)	8	(0.630)	(0.234)		(0.188)	
			3–14					
Levels with country and wave fixed effects	139	1.264	83	0.826	−0.729		0.937**	.02
		(0.903)	8	(1.697)	(0.910)		(0.236)	
			3–14					

Table 1 continued

Dependent variable and specification	n[a]	lnGDP[b]	n[c] cty wav	lnGDP[d]	lnGDP[e]	Attach[f]	Attach × lnGDP[g]	ΔR^{2}[h]
Short first differences[i]	19	0.108 (0.839)	11 6 1–2	−0.391 (1.331)	−1.231 (0.897)		0.944** (0.260)	.62
Long first differences[j]	9	2.108 (1.676)	5 5 1	1.491 (2.495)	0.314 (1.299)		0.917′ (0.292)	.74

Robust standard errors clustered by country in parentheses. Average of attachment security included as a control variable in levels-models

[a] Sample sizes in the Eurobarometer data used by Stevenson and Wolfers (2008): number of country waves in levels and number of differences

[b] Estimates of the coefficient for the logarithm of real GDP per capita predicting SWB (see Eq. 3)

[c] Sample sizes in the Eurobarometer data for countries with attachment data: n = number of observations; cty = number of countries; wav = number of measurement waves for SWB

[d] Estimates of the coefficient for the logarithm of GDP per capita predicting SWB for the sample of countries with attachment data (see Eq. 3)

[e] Estimates of the coefficient for the logarithm of GDP per capita predicting SWB in models with interactions (see Eq. 4)

[f] Estimates of the coefficient for the attachment security predicting SWB in models with interactions (see Eq. 4)

[g] Estimates for the interaction term for logarithm of real GDP per capita and average attachment security predicting SWB (see Eq. 4)

[h] Change in R^2 when the interaction term *Attachment* × *lnGDP* is added to the Eq. (3)

[i] As in Stevenson and Wolfers (2008), data were averaged by country in five-year periods, and first differences of SWB were regressed against first differences in the logarithm of average real GDP per capita

[j] As in Stevenson and Wolfers (2008), data from different decades were averaged separately, and first differences of SWB were regressed against first differences in the logarithm of average real GDP per capita

′ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

Table 2 Regressions of SWB on the Logarithm of GDP per Capita and Attachment Security: World Values Survey

Dependent variable and specification	n[a]	lnGDP[b]	n[c] cty wav	lnGDP[d]	lnGDP[e]	Attach[f]	Attach × lnGDP[g]	ΔR^{2}[h]
Life satisfaction								
Levels	165	0.413***	137	0.748***	0.752***	0.058	−0.044	.00
		(0.042)	48	(0.095)	(0.482)	(0.094)	(0.093)	
			1–5					
Levels with country fixed effects	165	0.301**	137	0.810**	0.807**		0.101	.00
		(0.090)	48	(0.235)	(0.231)		(0.204)	
			1–5					
Levels with country and wave fixed effects	165	0.552***	137	1.335***	1.339***		0.101	.00
		(0.118)	48	(0.314)	(0.302)		(0.178)	
			1–5					
Short first differences[i]	87	0.596***	89	1.666***	1.705***		0.264	.01
		(0.082)	39	(0.310)	(0.315)		(0.248)	
			2–5					
Long first differences[j]	49	0.314***	39	0.898***	0.898***		0.111	.00
		(0.072)	39	(0.222)	(0.225)		(0.145)	
			2					
Happiness								
Levels	164	0.228**	137	0.100**	0.100**	−0.000	−0.020	.00
		(0.065)	48	(0.034)	(0.035)	(0.027)	(0.029)	
			1–5					
Levels with country fixed effects	164	0.363**	137	0.261**	0.258**		0.028	.00
		(0.130)	48	(0.071)	(0.072)		(0.079)	
			1–5					
Levels with country and wave fixed effects	164	0.216	137	0.090	0.088		0.018	.00
		(0.186)	48	(0.127)	(0.124)		(0.067)	
			1–5					

Table 2 continued

Dependent variable and specification	n[a]	lnGDP[b]	n[c] cty wav	lnGDP[d]	lnGDP[e]	Attach[f]	Attach × lnGDP[g]	ΔR^{2}[h]
Short first differences[h]	86	0.215 (0.136)	89 39 2–5	0.110 (0.139)	0.117 (0.132)		0.074 (0.087)	.01
Long first differences[i]	49	0.114 (0.102)	39 39 2	0.01 (0.077)	0.003 (0.076)		0.038 (0.048)	.01

Robust standard errors clustered by country in parentheses. Average of attachment security included as a control variable in levels-models

[a] Sample sizes in the World Values Survey data, 1981–2004 (as used by Stevenson and Wolfers, 2008): number of country waves in levels and number of differences

[b] Estimates of the coefficient for the logarithm of real GDP per capita predicting SWB in the World Values Survey data, 1981–2004 (see Eq. 3)

[c] Sample sizes in the World Value Survey data, 1981–2009, for countries with attachment data: n = number of observations; cty = number of countries; wav = number of measurement waves for SWB

[d] Estimates of the coefficient for the logarithm of GDP per capita predicting SWB in the World Values Survey data, 1981–2009, for the sample of countries with attachment data (see Eq. 3)

[e] Estimates of the coefficient for the logarithm of GDP per capita predicting SWB in the World Values Survey data, 1981–2009, in models with interactions (see Eq. 4)

[f] Estimates of the coefficient for the attachment security predicting SWB in models with interactions (see Eq. 4)

[g] Estimates for the interaction term for logarithm of real GDP per capita and average attachment security predicting SWB in the World Values Survey data, 1981–2009 (see Eq. 4)

[h] Change in R^2 when the interaction term *Attachment* × *lnGDP* is added to the Eq. 3

[i] As in Stevenson and Wolfers (2008), the short differences are of consecutive country-wave observations

[j] As in Stevenson and Wolfers (2008), the long differences are from the first and the last observation for each country

′ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

ences.[5] For the Eurobarometer data, short first differences are differences of five-year averages and long first differences are differences of decadal averages. For the WVS data, short differences are differences between consecutive waves, and long differences are differences between the last and first waves. We consider the difference specifications and specifications including a full set of country and wave fixed effects to be the most compelling and strictest tests of our hypotheses. This is because both types of specifications account for the common time effects. The estimates are therefore based on the differential within-variation between countries so that we do not need to worry about spurious time-series correlation between the averages of the two variables.

In the next columns, we interact the logarithm of real GDP per capita variable with the average attachment security level, and use it as an additional explanatory variable. Thus, the equation to be estimated is

$$SWB_{it} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 ATT_i \times \ln GDP_{it} + \mu_{it} \quad (4)$$

where the coefficient of the log of real GDP is now allowed to vary between countries according to the level of average attachment security. More specifically, the coefficient is assumed to be a linear function of our attachment security variable ATT_i, resulting in the specification in Eq. (4). Variable ATT_i is included as a control variable in the level models without the country fixed effects to account for a possible main effect of attachment security.[6]

In Table 1, in which the Eurobarometer data is used, the coefficient for the interaction variable is positive except in regressions consisting only of the levels of log GDP. The coefficient is statistically significantly different from zero ($p < .05$) in five and almost significant ($p < .10$) in two out of ten specifications. When the WVS data is used (Table 2), the coefficient is positive in all except one specification, but it is not statistically significant in any of them. The pattern in Tables 1 and 2 suggests that log GDP is a more important predictor of SWB in countries with a higher average secure attachment. This association is statistically significant most often when log GDP alone is not a significant predictor of SWB, i.e. in the Eurobarometer data, specifically with the happiness variable. In the Eurobarometer data, we find statistically significant or almost significant estimates in our preferred specifications (difference, or level models with the country and wave fixed effects), which also show improved coefficient of determination R^2 compared to equations that only include log GDP. Including the attachment–GDP interaction term does not improve the coefficient of determination in the WVS data.[7]

Above, we assumed that the gradient depended linearly on attachment. Relaxing this assumption, we divided our sample of countries into three groups: countries in the lowest quartile, countries in the middle two quartiles, and countries in the highest quartile of average attachment security. In Tables 3 and 4 we report the estimates of the coefficients of the logarithm of GDP per capita on SWB in the three groups. That is, we estimate model

[5] See Hovi and Laamanen (2015) for a more elaborate discussion on different types of models of GDP and SWB and their interpretations.

[6] The inclusion of the attachment main effect in the regression equations leads to very high multicollinearity. Mean centering of the variables has been proposed as a way of alleviating multicollinearity (Aiken and West 1991). We tried this as a robustness check, and the results remained qualitatively intact.

[7] We checked the robustness of the estimates by excluding Belgium from the sample. In the Eurobarometer data, the prediction of life satisfaction by the interaction of attachment and log GDP was no longer statistically significant, whereas the prediction of happiness by the interaction became, in general, more statistically significant. The estimates of the interaction term were not affected by the exclusion of Belgium in the WVS data.

Table 3 Regressions of SWB on the Logarithm of GDP per Capita According to the Level of Attachment Security: Eurobarometer Survey

Dependent variable and specification	n^a cty wav	Attachment security < 25 %[b]	n^c cty wav	25 % ≤ Attachment security < 75 %[b]	n^d cty wav	75 % ≤ Attachment security[b]
Life satisfaction						
Levels	141	0.369	224	1.106*	123	0.554*
	5	(0.238)	10	(0.352)	6	(0.162)
	7–55		3–55		1–55	
Levels with country fixed effects	141	0.017	224	0.147*	123	0.635**
	5	(0.304)	10	(0.056)	6	(0.098)
	7–55		3–55		1–55	
Levels with country and wave fixed effects	141	0.084	224	0.802*	123	0.975*
	5	(0.660)	10	(0.282)	6	(0.308)
	7–55		3–55		1–55	
Short first differences[e]	14	1.664	21	1.115**	12	1.733*
	3	(1.185)	4	(0.342)	3	(0.632)
	3–7		5–7		3–7	
Long first differences[f]	7	−0.294	10	1.418*	6	1.898′
	3	(2.370)	4	(0.468)	3	(0.724)
	2–4		3–4		2–4	
Happiness						
Levels	28	−0.518	38	2.184*	17	1.717**
	2	(1.062)	4	(0.603)	2	(0.011)
	14		3–14		3, 14	
Levels with country fixed effects	28	−0.518	38	0.910***	17	1.717**
	2	(1.062)	4	(0.053)	2	(0.011)
	14		3–14		3, 14	
Levels with country and wave fixed effects	28	6.250***	38	−1.491	17	88.326***
	2	(0.000)	4	(1.853)	2	(0.0005)
	14		3–14		3, 14	

Table 3 continued

Dependent variable and specification	n^a cty wav	Attachment security < 25 %[b]	n^c cty wav	25 % ≤ Attachment security < 75 %[b]	n^d cty wav	75 % ≤ Attachment security[b]
Short first differences[e]	4	4.959	5	−1.778	2	–
	2	(9.780)	3	(1.776)	1	
	3		2–3		3	
Long first differences[f]	2	–	2	–	1	–
	2		2		1	
	2		2		2	

Robust standard errors clustered by country in parentheses. Average of attachment security included as a control variable in levels-models

[a] Sample sizes among countries with an average attachment security among the lowest 25 %: n = number of observations; cty = number of countries; wav = number of measurement waves for SWB

[b] Estimates of the coefficient for the logarithm of real GDP per capita predicting SWB (see Eq. 3)

[c] Sample sizes among countries with an average attachment security equal to or more than 25 % and below 75 % of the distribution: n = number of observations; cty = number of countries; wav = number of measurement waves for SWB

[d] Sample sizes among countries with an average attachment security among the highest 25 %: n = number of observations; cty = number of countries; wav = number of measurement waves for SWB

[e] As in Stevenson and Wolfers (2008), data were averaged by country in five-year periods, and first differences of SWB were regressed against first differences in the logarithm of average real GDP per capita

[f] As in Stevenson and Wolfers (2008), data from different decades were averaged separately, and first differences of SWB were regressed against first differences in the logarithm of average real GDP per capita

′ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

Table 4 Panel Regressions of SWB on the Logarithm of GDP per Capita According to the Level of Attachment Security: World Values Survey, 1981-2009, Excluding Countries with Only One Wave

Dependent variable and specification	n^a cty wav	Attachment security < 25 %[b]	n^c cty wav	25 % ≤ attachment security < 75 %[b]	n^d cty wav	75 % ≤ attachment security[b]
Life satisfaction						
Levels	30	0.696	66	0.749***	36	0.954*
	9	(0.411)	21	(0.119)	10	(0.395)
	2–5		2–5		2–5	
Levels with country fixed effects	30	0.845′	66	0.645*	36	1.298*
	9	(0.407)	21	(0.265)	10	(0.521)
	2–5		2–5		2–5	
Levels with country and wave fixed effects	30	1.371**	66	1.346**	36	1.869**
	9	(0.360)	21	(0.450)	10	(0.437)
	2–5		2–5		2–5	
Short first differences[e]	21	1.544*	45	1.546**	26	2.443***
	9	(0.650)	21	(0.379)	10	(0.679)
	2–5		2–5		2–5	
Long first differences[f]	9	0.730′	21	0.818**	10	1.502′
	9	(0.371)	21	(0.279)	10	(0.801)
	2		2		2	
Happiness						
Levels	30	0.261*	66	0.135**	36	0.125
	9	(0.095)	21	(0.037)	10	(0.126)
	2–5		2–5		2–5	
Levels with country fixed effects	30	0.231	66	0.214*	36	0.362*
	9	(0.184)	21	(0.081)	10	(0.140)
	2–5		2–5		2–5	
Levels with country and wave fixed effects	30	−0.151	66	0.017	36	0.388
	9	(0.180)	21	(0.139)	10	(0.228)
	2–5		2–5		2–5	

Table 4 continued

Dependent variable and specification	n^a cty wav	Attachment security < 25 %[b]	n^c cty wav	25 % ≤ attachment security < 75 %[b]	n^d cty wav	75 % ≤ attachment security[b]
Short first differences[e]	21	−0.221*	45	0.134	26	0.551**
	9	(0.081)	21	(0.189)	10	(0.163)
	2–5		2–5		2–5	
Long first differences[f]	9	0.051	21	–0.120	10	0.306
	9	(0.073)	21	(0.098)	10	(0.192)
	2		2		2	

Robust standard errors clustered by country in parentheses. Average of attachment security included as a control variable in levels-models

[a] Sample sizes among countries with an average attachment security among the lowest 25 %: n = number of observations; cty = number of countries; wav = number of measurement waves for SWB

[b] Estimates of the coefficient for the logarithm of real GDP per capita predicting SWB (see Eq. 3)

[c] Sample sizes among countries with an average attachment security equal to or more than 25 % and below 75 % of the distribution: n = number of observations; cty = number of countries; wav = number of measurement waves for SWB

[d] Sample sizes among countries with an average attachment security among the highest 25 %: n = number of observations; cty = number of countries; wav = number of measurement waves for SWB

[e] As in Stevenson and Wolfers (2008), the short differences are of consecutive country-wave observations

[f] As in Stevenson and Wolfers (2008), the long differences are from the first and the last observation for each country

′ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

(3) separately for the three groups. Overall, we tend to find that the stronger the attachment, the higher is also the association of log GDP with SWB. Furthermore, the statistical significance of the coefficient estimates tends to improve when the models are estimated for a set of countries in which attachment is more secure. In Table 3, the model in levels with the country and wave fixed effects produces estimates that are implausible (i.e. standard errors which are practically zero) and are probably the result of the fact that only a few countries are in the sample.[8]

Although we did not find statistically significant estimates for the interaction term in the WVS data in Table 2, we did find some results supporting the hypothesis in the WVS data in Table 4. The estimates for the association of log GDP with SWB are strongest among the group of countries with the highest average attachment security, especially in our preferred specifications (difference, or level models with the country and wave fixed effects). For short first differences of happiness, we find a significant negative effect in the lowest quartile and a significant positive effect in the highest quartile.

Because the GDP–SWB gradient appeared to depend on attachment security non-linearly in some specifications, we added a squared attachment interaction term in the regression equations ($ATT^2 \times lnGDP$). We found two almost significant squared interaction coefficients: in predicting happiness in the Eurobarometer data in a regression with country fixed effects (beta = −0.28, $SE = 0.13$, 95 % CI [−0.58, 0.02]); the first degree interaction term (beta = 0.80, $SE = 0.09$, 95 % CI [0.59, 1.00]) and in predicting life satisfaction in WVS in a regression with short first differences (beta = 0.36, $SE = 0.21$, 95 % CI [−0.07, 0.79]); the first degree interaction term (beta = 0.39, $SE = 0.24$, 95 % CI [−0.10, 0.88]). We observed a significant and positive squared coefficient of attachment security in predicting life satisfaction in WVS with the country and time fixed effects (beta = 0.32, $SE = 0.12$, 95 % CI [0.08, 0.56]); the first degree interaction term (beta = 0.14, $SE = 0.14$, 95 % CI [−0.15, 0.43]).

It is interesting to note that the estimated main effect of attachment security is not statistically significant in any of the models. It also appears that attachment security is often negatively correlated with SWB in our data sets. As we consider attachment security as a control variable and a moderator in this paper, further research could investigate more closely the association between secure attachment and SWB at the country level.

5 Discussion

The relationship between subjective well-being (SWB) and economic growth has been under debate. Empirical studies that find a positive average effect also reveal substantial heterogeneity across countries in the magnitude and even the sign of the effect. Integrating approaches across social sciences may be helpful in order to understand this heterogeneity better. In particular, models of individual and country differences in relative income concerns may provide useful hypotheses about differences in how economic growth is transformed into SWB.

In this paper, we tested the concept of relational ability as modelled by Pugno (2009) as a potential confounder in the association between GDP growth and SWB. To assess the

[8] Excluding Belgium from the sample led the estimates of log GDP to be statistically significant in the lowest quartile when predicting life satisfaction in the Eurobarometer data in levels with and without the country fixed effects. In the WVS data, the exclusion of Belgium decreased the statistical significance of differences in log GDP predicting life satisfaction in the lowest quartile. The estimate of log GDP predicting happiness in long first differences became almost statistically significant ($p < .10$).

relevance of this confounder in the economic growth–SWB nexus, we used the country averages of attachment security as the indicators of average relational ability. The model implies that countries with a more secure average attachment style should have a more positive association between GDP growth and SWB. The reason for this is that securely attached individuals derive their SWB more from mutually beneficial relationships or relational goods rather than from comparison income that does not enhance the average level of SWB.

We presented evidence that differences between countries in the GDP–SWB gradient can be explained by differences in the averages of attachment security, at least to some degree. In particular, using the same data sets and similar empirical strategies, we were able to partly explain the differences of the GDP–SWB gradient between countries documented in Stevenson and Wolfers (2008). We provided evidence consistent with the hypothesis that economic growth improves SWB more in countries with higher average attachment security than in countries with lower average attachment security. This finding is in accordance with the theoretical ideas of Pugno (2009). Our results are particularly helpful in explaining anomalies that were documented in Stevenson and Wolfers (2008). First, the support for our hypotheses was the strongest in the data where log GDP alone was least able to predict SWB, i.e. happiness in the Eurobarometer survey. This is also consistent with the idea that comparison income effects are larger for happiness than for life satisfaction (Deaton and Stone 2013). Second, we found that Belgium, which has the puzzling negative GDP–SWB gradient, also has one of the lowest estimates of the average of attachment security in the sample of all countries.

Using the WVS data we were unable to find statistically significant estimates for the interaction term of attachment security and GDP. However, dividing the countries by their level of average attachment security produced some results confirming our hypothesis. The lack of significant results might be partially explained by the fact that WVS includes more countries with lower levels of GDP and where college students might be more unrepresentative of the total population. The lack of significance seemed not to be completely driven by the sample of countries, because using only European countries in the WVS produced the same non-significant results.[9] One possible explanation could be that the WVS data includes fewer data points (measurement waves varied from one to five) than the Eurobarometer (measurement waves varied from 5 to 55) and the tests therefore did not have enough power to identify the effects in the WVS data. Another possible interpretation is that the significant results are spurious. Whichever the case is, the hypotheses need to be tested using other datasets.

In none of the models, that included the main effect of attachment security was its coefficient found to be statistically significantly different from zero. One reason for the absence of an association could be that the link between attachment security and SWB is complex. Indeed, in a recent study, Karreman and Vingerhoets (2012) document that, in addition to the secure attachment style, one of the insecure attachment styles (dismissive) is also indirectly positively associated with reported subjective well-being.

There are important limitations in our analysis. The data on the population average attachment security originates from a cross-section. In future research it would be useful to estimate similar models using panel data on attachment styles.[10] To the best of our knowledge, there are no panel data available on attachment security covering a reasonable

[9] The results are available from the authors.

[10] There are earlier empirical studies that have examined various measures of SWB in panel data settings (e.g. Böckerman and Ilmakunnas 2009).

number of countries. Also, most respondents in the data that we use on attachment security are college students. This implies that our measure of attachment styles contains a substantial amount of measurement error when applied to the population level. Measurement error causes attenuation bias in the estimates and having (classical) measurement error in an explanatory variable typically leads to a bias toward zero. This implies that our estimates are conservative and that better measures on attachment security could provide stronger results.

6 Conclusions

Our findings suggest that the quality of social ties can have an important role to play in the way that economic growth transforms into SWB. The results are somewhat fragile. We would have more confidence in them if there were more direct evidence about the hypothesized mechanism of influence, i.e. that attachment security influences relative income concerns which moderate the effects of economic growth on SWB. This could be tested by analyzing whether country differences in attachment security predict relative income concerns and whether adding an interaction term of relative income concerns and GDP to the regression equation decreases the coefficient of the interaction term of attachments security and GDP. In other words, country differences in attachment would be associated with differences in relative income concerns and this association could explain the association between attachment security and GDP–SWB gradients. Country differences in relative income concerns can be measured by using survey data that gather information about relative income concerns directly (Corazzini et al. 2012) or by country differences in the strength of the estimated association between one's own SWB and the reference group's income (Caporale et al. 2009).

If attachment security does moderate the effects of GDP, it could become a policy target. There are already proven ways to improve attachment security at least at the individual level (e.g. Bakermans-Kranenburg et al. 2003). Attachment security or relational ability is only one potential confounder that may be useful in understanding the heterogeneity in the estimates of the association between economic growth and SWB. Prior research has identified confounders related to culture (Borrero et al. 2013), economic and social policy (Corazzini et al. 2012), and personality (Proto and Rustichini 2013) as potentially relevant factors. Future research should clarify their significance and associations to one another in order to broaden our understanding of the welfare implications of economic growth and to inform better economic and social policies.

Acknowledgments This research was supported by the Academy of Finland (Project No. 252369). We are grateful for helpful discussions and comments from Markus Haavio, Juha Itkonen, Jukka Pirttilä, Maurizio Pugno and participants at the Annual Congress of the International Institute of Public Finance (Lugano) as well as from two anonymous reviewers.

References

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.

Akay, A., Martinsson, P., & Medhin, H. (2012). Does positional concern matter in poor societies? Evidence from a survey experiment in rural Ethiopia. *World Development, 40*, 428–435.

Alpizar, F., Carlsson, F., & Johansson-Stenman, O. (2005). How much do we care about absolute versus relative income and consumption? *Journal of Economic Behavior & Organization, 56*, 405–421.
Alvarez-Cuadrado, F., & Long, N. V. (2011). The relative income hypothesis. *Journal of Economic Dynamics and Control, 35*, 1489–1501.
Bakermans-Kranenburg, M. J., van IJzendoorn, M. H., & Juffer, F. (2003). Less is more: Meta-analyses of sensitivity and attachment interventions in early childhood. *Psychological Bulletin, 129*, 195–215.
Bartholomew, K., & Horowitz, L. M. (1991). Attachment styles in young adults: A test of a four-category model. *Journal of Personality and Social Psychology, 62*, 226–244.
Bartolini, S., Bilancini, E., & Sarracino, F. (2009). Sociability predicts happiness: World-wide evidence from time series. Department of Economics University of Siena No. 579. Department of Economics, University of Siena. Retrieved from http://ideas.repec.org/p/usi/wpaper/579.html.
Böckerman, P., & Ilmakunnas, P. (2009). Unemployment and self-assessed health: Evidence from panel data. *Health Economics, 18*, 161–179.
Borrero, S., Escobar, A. B., Cortés, A. M., & Maya, L. C. (2013). Poor and distressed, but happy: Situational and cultural moderators of the relationship between wealth and happiness. *Estudios Gerenciales, 29*, 2–11.
Boyce, C. J., Brown, G. D. A., & Moore, S. C. (2010). Money and happiness: Rank of income, not income, affects life satisfaction. *Psychological Science, 21*, 471–475.
Bruni, L., & Stanca, L. (2008). Watching alone: Relational goods, television and happiness. *Journal of Economic Behavior & Organization, 65*, 506–528.
Caporale, G. M., Georgellis, Y., Tsitsianis, N., & Yin, Y. P. (2009). Income and happiness across Europe: Do reference values matter? *Journal of Economic Psychology, 30*, 42–51.
Clark, A. E., Frijters, P., & Shields, M. A. (2008). Relative income, happiness, and utility: An explanation for the Easterlin paradox and other puzzles. *Journal of Economic Literature, 46*, 95–144.
Corazzini, L., Esposito, L., & Majorano, F. (2012). Reign in hell or serve in heaven? A cross-country journey into the relative vs absolute perceptions of well-being. *Journal of Economic Behavior & Organization, 81*, 715–730.
Deaton, A. (2008). Income, health and well-being around the world: Evidence from the Gallup World Poll. *Journal of Economic Perspectives, 22*, 53–72.
Deaton, A., & Stone, A. A. (2013). Two happiness puzzles. *American Economic Review, 103*, 591–597.
del Salinas-Jiménez, M., Artés, J., & Salinas-Jiménez, J. (2010). Income, motivation, and satisfaction with life: An empirical analysis. *Journal of Happiness Studies, 11*, 779–793.
Diener, E., Oishi, S., & Lucas, R. E. (2003). Personality, culture, and subjective well-being: Emotional and cognitive evaluations of life. *Annual Review of Psychology, 54*, 403–425.
DiTommaso, E., Brannen-McNulty, C., Ross, L., & Burgess, M. (2003). Attachment styles, social skills and loneliness in young adults. *Personality and Individual Differences, 35*, 303–312.
Easterlin, R. A. (1974). Does economic growth improve the human lot? Some empirical evidence. In P. A. David & W. R. Melvin (Eds.), *Nations and households in economic growth* (pp. 89–125). New York: Academic Press.
Easterlin, R. A. (1995). Will raising the incomes of all increase the happiness of all? *Journal of Economic Behavior & Organization, 27*, 35–47.
Easterlin, R. A., McVey, L. A., Switek, M., Sawangfa, O., & Zweig, J. S. (2010). The happiness–income paradox revisited. *Proceedings of the National Academy of Sciences, 107*, 22463–22468.
Ferrer-i-Carbonell, A. (2005). Income and well-being: An empirical analysis of the comparison income effect. *Journal of Public Economics, 89*, 997–1019.
Fraley, R. C., & Shaver, P. R. (2000). Adult romantic attachment: Theoretical developments, emerging controversies, and unanswered questions. *Review of General Psychology, 4*, 132–154.
Georgellis, Y., Tsitsianis, N., & Yin, Y. P. (2009). Personal values as mitigating factors in the link between income and life satisfaction: Evidence from the European Social Survey. *Social Indicators Research, 91*, 329–344.
Graham, C., Chattopadhyay, S., & Picon, M. (2010). The Easterlin and other paradoxes: Why both sides of the debate may be correct. In E. Diener, D. Kahneman, & J. Helliwell (Eds.), *International differences in well-being* (pp. 247–290). Oxford: Oxford University Press.
Gui, B. (1996). On "relational goods": Strategic implications of investment in relationships. *International Journal of Social Economics, 23*, 260–278.
Hazan, C., & Shaver, P. R. (1994). Attachment as an organizational framework for research on close relationships. *Psychological Inquiry, 5*, 1–22.
Heine, S. J., Buchtel, E. E., & Norenzayan, A. (2008). What do cross-national comparisons of personality traits tell us? The case of conscientiousness. *Psychological Science, 19*, 309–313.
Hilburn-Cobb, C. (2004). Adolescent psychopathology in terms of multiple behavioral systems: The role of attachment and controlling strategies and frankly disorganized behavior. In L. Atkinson & S. Goldberg

(Eds.), *Attachment issues in psychopathology and intervention* (pp. 99–135). Mahwah, NJ: Lawrence Erlbaum.

Hovi, M., & Laamanen, J.-P. (2015). It's complicated. The relationship between GDP and subjective well-being. Tampere Economic Working Papers 97. University of Tampere.

Irons, C., & Gilbert, P. (2005). Evolved mechanisms in adolescent anxiety and depression symptoms: The role of the attachment and social rank systems. *Journal of Adolescence, 28*, 325–341.

Karreman, A., & Vingerhoets, A. J. (2012). Attachment and well-being: The mediating role of emotion regulation and resilience. *Personality and Individual Differences, 53*, 821–826.

Krueger, A. (2008). Comments on economic growth and subjective well-being: Reassessing the Easterlin Paradox. *Brookings Papers on Economic Activity, 39*, 95–100.

Layard, R., Mayraz, G., & Nickell, S. (2010). Does relative income matter? Are the critics right? In E. Diener, D. Kahneman, & J. Helliwell (Eds.), *International differences in well-being* (pp. 139–165). Oxford: Oxford University Press.

Noftle, E. E., & Shaver, P. R. (2006). Attachment dimensions and the big five personality traits: Associations and comparative ability to predict relationship quality. *Journal of Research in Personality, 40*, 179–208.

Proto, E., & Rustichini, A. (2013). A reassessment of the relationship between GDP and life satisfaction. *PLoS One, 8*(11), e79358.

Pugno, M. (2009). The Easterlin paradox and the decline of social capital: An integrated explanation. *Journal of Socio-Economics, 38*, 590–600.

Rojas, M. (2007). Heterogeneity in the relationship between income and happiness: A conceptual-referent-theory explanation. *Journal of Economic Psychology, 28*, 1–14.

Sacks, D., & Wolfers, J. (2010). Debunking the Easterlin paradox, again. *The Brookings Institution*. Retrieved April 14, 2014, from http://www.brookings.edu/research/opinions/2010/12/13-debunking-easterlin-wolfers.

Schmitt, D. P., Alcalay, L., Allensworth, M., Allik, J., Ault, L., Austers, I., et al. (2004). Patterns and universals of adult romantic attachment across 62 cultural regions are models of self and of other pancultural constructs? *Journal of Cross-Cultural Psychology, 35*, 367–402.

Stevenson, B., & Wolfers, J. (2008). Economic growth and subjective well-being: Reassessing the Easterlin Paradox. *Brookings Papers on Economic Activity, 39*, 1–102.

Stevenson, B., & Wolfers, J. (2013). Subjective well-being and income: Is there any evidence of satiation? *The American Economic Review, 103*, 598–604.

Towler, A. J., & Stuhlmacher, A. F. (2013). Attachment styles, relationship satisfaction, and well-being in working women. *Journal of Social Psychology, 153*, 279–298.

Uhlaner, C. J. (1989). "Relational goods" and participation: Incorporating sociability into a theory of rational action. *Public Choice, 62*, 253–285.

Van Lange, P. A., De Bruin, E. M. N., Otten, W., & Joireman, J. A. (1997). Development of prosocial, individualistic, and competitive orientations: Theory and preliminary evidence. *Journal of Personality and Social Psychology, 73*, 733–746.