



International Journal of Happiness and Development

ISSN online: 2049-2804 - ISSN print: 2049-2790

<https://www.inderscience.com/ijhd>

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DOI: [10.1504/IJHD.2025.10075274](https://doi.org/10.1504/IJHD.2025.10075274)

Article History:

Received:	02 February 2024
Last revised:	03 May 2024
Accepted:	06 May 2024
Published online:	22 May 2026

Subjective wellbeing and behavioural preferences: evidence from global survey data

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Abstract: Previous work has shown that behavioural traits are key determinants of subjective wellbeing (SWB). We provide global evidence on the relationship between a set of behavioural preferences and SWB. Preferences measure behavioural traits based on both subjective and experimental data. We use the global preferences survey (GPS) and the Gallup World Poll (GWP) covering a globally representative population from 76 countries. Results indicate strong correlations between different measures of SWB and the set of preferences consisting of patience, risk taking, positive reciprocity, negative reciprocity, altruism and trust. The correlations tend to be positive suggesting that being more patient, risk taking, reciprocal, altruistic or trusting is beneficial for SWB. The coefficients are remarkably similar for the different regions of the world.

Keywords: SWB; subjective wellbeing; preferences; Gallup data; regression analysis; globally representative data; life satisfaction; happiness; worry; sadness; patience; risk taking.

Reference to this paper should be made as follows: Overdick, K. and De Neve, J-E. (2026) 'Subjective wellbeing and behavioural preferences: evidence from global survey data', *Int. J. Happiness and Development*, Vol. 10, No. 2, pp.140–171.

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This paper is a revised and expanded version of a paper entitled 'Subjective wellbeing and behavioural preferences: evidence from globally representative survey data' presented at the *2023 ISQOLS Conference*, Rotterdam 21–25 August 2023.

1 Introduction

Governments and researchers around the world are increasingly paying attention to the wellbeing of populations, recognising that it is an essential measure of worthwhile progress (Diener et al., 2018). Beyond being a worthy cause in itself, subjective wellbeing (SWB) is also an important causal factor of beneficial behaviours in various areas of life, including productivity at work (Bellet et al., 2023; De Neve et al., 2013; Lane, 2017). But what determines wellbeing and explains the differences in wellbeing across the globe? Whereas a thriving strand of the literature has attempted to determine the concrete causes of wellbeing in the form of income, personal characteristics and so forth, little research so far has attempted to look at behavioural attitudes as drivers of wellbeing.

Economists have developed preferences as key measures for describing behavioural patterns of a population. Preferences combine both subjective (stated) and experimental (revealed) data and range from patience to trust and risk taking (Falk et al., 2023). This represents a key difference to more common measures of behavioural attitudes that rely solely on subjective data. Preferences relate to a number of key outcomes in life (Falk et al., 2018; Sunde et al., 2022). For example, patience in a population correlates consistently with its comparative development (Sunde et al., 2022). Thus, differences in preferences could have potential long and short-term effects on wellbeing.

There is a big gap in the literature for global evidence on the correlation of SWB and preferences. One notable exception is a paper on the effect of patience on SWB using the same data that finds a positive effect (Giuliano and Sapienza, 2020). It analyses the relationship with a quadratic function and shows that patience is only beneficial for wellbeing up to a certain limit. In essence, we broaden this analysis to all available measures of preferences. With this, we seek to contribute to the literature examining the role behavioural attributes play in shaping SWB. The diverse group of preferences enables us to compare the effect of different preferences and to discover more insights about the role of preferences for SWB. We ask the following research question: To what extent and in what way does SWB correlate with preferences?

Our data come from the global preferences survey (GPS) combined with the Gallup World Poll (GWP) and were collected in 2012 in 76 countries around the world. The data spans different continents, cultures and countries in order to provide insights on a global scale. SWB measures are defined as the numerical answers to questions on subjective states of survey participants. They include evaluative measures such as life satisfaction and life satisfaction in five years and affective measures more to do with in-the-moment feelings, such as happiness, sadness, smile or laugh, enjoyment and worry (Gallup, 2012). The paper itself focuses on life satisfaction, happiness and worry. They were chosen based on their relevance and to represent all the different types of SWB variables. The preferences are patience, risk taking, positive and negative reciprocity, altruism and trust.¹ Preferences are defined as the standardised outcomes of experimental and survey evidence (Falk et al., 2018, 2023). Higher values for preferences mean being more patient, risk taking, positively and negatively reciprocal, altruistic and trusting. Similar to SWB measures, the survey part of a preference measure would directly ask respondents about their attitude toward a particular preference on a scale. The experimental part would be a suitable experiment as used in the economic literature.

The empirical approach of this paper is to estimate OLS regressions with the SWB variables as the dependent variables respectively.² The preference variables serve as the explanatory variables for each SWB variable. It is important to note that this analysis is purely correlational and unable to support causal claims. This is discussed in more detail in the discussion section together with the potential issue of reverse causality. The set of control variables includes age, gender and income among others.

Our results show that having stronger preferences – being more patient, risk taking, reciprocal, altruistic and trusting – is significantly and positively correlated with SWB in almost all cases.³ The size of the effects is large and broadly comparable to half of the sizeable gender gap in SWB (Blanchflower and Bryson, 2023). In accordance with this finding, preferences correlate positively with positive SWB variables (e.g., life satisfaction) and negatively with negative SWB variables (e.g., worry). The relationships sometimes have a significant quadratic component, and the results are remarkably homogenous across the different regions of the world.

The rest of this paper is structured as follows. Section 2 offers the literature review. Section 3 outlines the data. Section 4 contains methods and results. Section 5 discusses limitations, compares results and discusses them and Section 6 concludes.

2 Literature review

The study of wellbeing using SWB measures has received increasing interest in the last few decades (Diener et al., 2018). Previous research on the determinants of SWB shows that personal traits and behavioural attitudes are a relatively important group of variables for SWB (Ferrer-i-Carbonell and Frijters, 2004). Consequently, there are many studies that use concepts on behavioural attitudes that are similar but not directly related to preferences. An example of that kind is research on the attitude toward competition and how it does (not) influence SWB (Barrios, 2015). Moreover, the Big Five personality traits have received some research attention in the SWB context. The Big Five are a popular research tool and include five personality measures: openness to experience, conscientiousness, extraversion, agreeableness and neuroticism. For example, Boyce et al. (2013) find that the relative importance of the Big Five personality measures to life satisfaction is twice as high as all other variables including income combined. Research also shows that traits such as extraversion and neuroticism correlate strongly with SWB (González Gutiérrez et al., 2005). Other similar examples include concepts such as future orientation that are looked at in isolation in previous research (Azizli et al., 2015; de Meza and Dawson, 2020). Future orientation and self-efficacy (potentially similar to confidence) relate positively to life satisfaction (Azizli et al., 2015). Moreover, forms of trust – specifically beliefs on the likelihood of wallet return – are positively related to SWB (Helliwell et al., 2021). Trust as a measure related to social capital has also experienced significant research attention as a very beneficial factor for SWB (Yamamura et al., 2015). It is worth noting that there is some evidence that behavioural and psychological concepts such as the Big Five personality measures do not have significant overlap with preference measures (Becker et al., 2012).

Preferences link intricately to life decisions according to research (Falk et al., 2018). Therefore, preferences would shape lives and thus life outcomes and SWB (Falk et al., 2018; Sunde et al., 2022). If one assumes that preferences and life goals are related, evidence that the types of aims people set for themselves are related to SWB would also

offer an explanatory channel (Headey, 2008). An example of such a channel can be observed in the case of altruism. More altruistic individuals would be expected to engage in altruistic behaviour more frequently, e.g., in prosocial spending. Research has debated the impact of such behaviour on SWB but has pointed to positive effects (Falk and Graeber, 2020; Lok and Dunn, 2020). Falk and Graeber (2020) argue that the strength of the positive effects depends on whether research considered the opportunity cost of resources spent on altruism. If one assumes a positive effect of altruism on SWB, individuals with a higher preference for altruism would be happier on average.

Research by the authors of the GPS examines the relationship of preferences, other psychological measures and life satisfaction. It finds a positive correlation between preferences and life satisfaction based on data from the German Socio-Economic Panel Study (Becker et al., 2012). Giuliano and Sapienza (2020) focus on the relationship of patience and SWB in the first study based on the GPS data. It finds a positive but hump-shaped relationship and concludes that there is a cost to being too patient (Giuliano and Sapienza, 2020). Overall, the literature on preferences and related concepts and their relationship to SWB suggests that one can expect a positive and significant correlation for most preferences with SWB. In other words, more patient, risk taking, reciprocal, altruistic and trusting individuals would also be expected to have higher SWB.

3 Data

3.1 Data sources

The analyses in this paper are based on the GPS combined with the GWP. The GPS was run in 2012 and surveyed 80,000 people in 76 countries. The preference indices are measured as a combination of questions and experimental setups as described in the Preference Survey Module (Falk et al., 2023). They are weighted z-scores for the survey and experiment items of each preference (Falk et al., 2018). The precise weighting between subjective and experimental components differs from variable to variable. For example, whereas patience consists of an experiment and a survey question, trust is based on a survey question alone. Weights and questions were the result of an experimental validation procedure and arose endogenously from the validation findings (Falk et al., 2018). The variables we consider are patience, risk taking, positive and negative reciprocity, altruism and trust. Patience measures willingness to wait or trade current and future consumption. Risk taking is similar to tolerance for uncertainty of a reward and attitude toward risks. Positive reciprocity is the likelihood and size of the return of a favour or good deed. Negative reciprocity is the likelihood and magnitude of retaliation for a negative action towards oneself or others. Altruism is the willingness to divest personal resources to good causes without expecting a direct return. Trust is the extent to which participants believe others have good intentions.

The SWB variables stem from the GWP and include the Cantril ladder for life satisfaction now and in five years, happiness, worry and several broader indices. The indices combine evaluative and affective measures of SWB respectively (Gallup, 2012). The SWB variables enjoyment, sadness and smiling are also available. The measures are all exclusively question-based and consist of the numerical answers on the respective SWB measure. All measures and their components are explained further in the section below and in the appendix (Appendix A).

3.2 Summary statistics

Both the preference and the SWB data were collected as part of the GWP. The data come from countries that were selected to be globally representative and provide relatively few missing values. The poll contains 76 countries from regions all around the world that include the USA, China and many others. Table 1 show that the sample is approximately gender-balanced and has an average age of around 42. The overall sample provides around 80,000 respondents in the year 2012 in which responses were collected, or roughly 1000 respondents per country sampled. Average life satisfaction in the sample is 5.694, average future life satisfaction is 6.741 and the positive affective variables happiness, smile or laugh and enjoyment all have a mean of around 0.7, meaning 70% of people answered yes to the respective question. The mean for worry is 0.367 and for sadness 0.237. Since the preference variables are provided in z-scores, the standard deviation is always equal to one and the mean equal to zero. However, the ranges differ for the variables and lie between -4 and 3 meaning observations are no more than four negative or three positive standard deviations away from the respective mean.

Table 1 Summary statistics

Variables	(1)	(2)	(3)
	<i>N</i>	<i>Mean</i>	<i>SD</i>
Life Today (0,10)	79,626	5.694	2.297
Life in Five Years (0,10)	73,779	6.741	2.417
Smile or Laugh (yes-no)	76,748	0.724	0.447
Enjoyment (yes-no)	77,137	0.710	0.454
Happiness (yes-no)	76,279	0.716	0.451
Worry (yes-no)	77,676	0.367	0.482
Sadness (yes-no)	77,594	0.237	0.425
Income (log)	79,337	9.205	1.515
Subj. math skills (0,10)	79,211	5.176	2.825
Gender (1 if female)	80,337	0.547	0.498
Age (divided by 10)	80,061	4.182	1.749
Life Evaluation Index (1,3)	73,656	2.176	0.622
Positive Experience Index (0,100)	78,264	68.86	28.46

This table shows the descriptive statistics of the overall dataset merged from Gallup data and preferences data. Variables are explained in more detail in Appendix A.

4 Regression analysis

4.1 Methodology

A basic correlation table shows that the correlations are positive between preferences and SWB (Appendix B, Table B1). In order to study the link between the different SWB variables and preferences more closely, we rely on country fixed effect OLS regressions following conventions in the literature (Falk et al., 2018; Ferrer-i-Carbonell and Frijters,

2004). Previous research has investigated a quadratic component of the relationship of preferences and SWB, which makes it imperative for us to examine this possibility by including squared terms (Giuliano and Sapienza, 2020). The regressions take the following form:

$$SWBVariable_{ic} = \beta_0 + \beta_1 Preference_{ic} + \beta_2 Preference_{ic}^2 + \eta' X_{ic} + \delta_c + \varepsilon_{ic} \quad (2.1)$$

In this equation, β_0 is the constant and β_1 and β_2 are the coefficients of interest. The $SWBVariable_{ic}$ variables used in the different regressions are life satisfaction, happiness and worry for individual i in country c .⁴ $Preference_{ic}$ is the placeholder for the different preferences patience, risk taking, positive reciprocity, negative reciprocity, altruism and trust. $Preference_{ic}^2$ squares the preferences, which is crucial to include given past research (Giuliano and Sapienza, 2020). Controls X_{ic} included here and throughout the paper are subjective math skills, age, age squared, education, gender, income, marital status and employment. Subjective math skill serves as an estimate of cognitive ability, which is highly relevant for preferences (Dohmen et al., 2010). δ_c is a vector of country fixed effects. Standard errors are clustered on the country level. Modifications include sub-sample regressions for split samples along gender and income and dummy variables for every single answer category on life satisfaction questions.

4.2 Overall results

Tables 2–4 show the regression results of OLS regressions for life satisfaction, happiness and worry following equation (2.1). Each column represents the SWB measure being regressed on one preference at a time. The alternative all-inclusive regressions can be found in Appendix F and show slightly smaller coefficients.

The individual preferences tend to show a positive correlation with SWB. The results that stand out are patience, risk taking, altruism and trust, which are all highly positively correlated with SWB. Positive and negative reciprocity show a somewhat weaker correlation. Out of the 18 regression coefficients for all three SWB variables, 14 are significant at the $p < 0.01$ level and only one is not significant at all. Life satisfaction correlations are always significant, and happiness shows the only insignificant correlation among the three variables, which is its correlation with negative reciprocity.

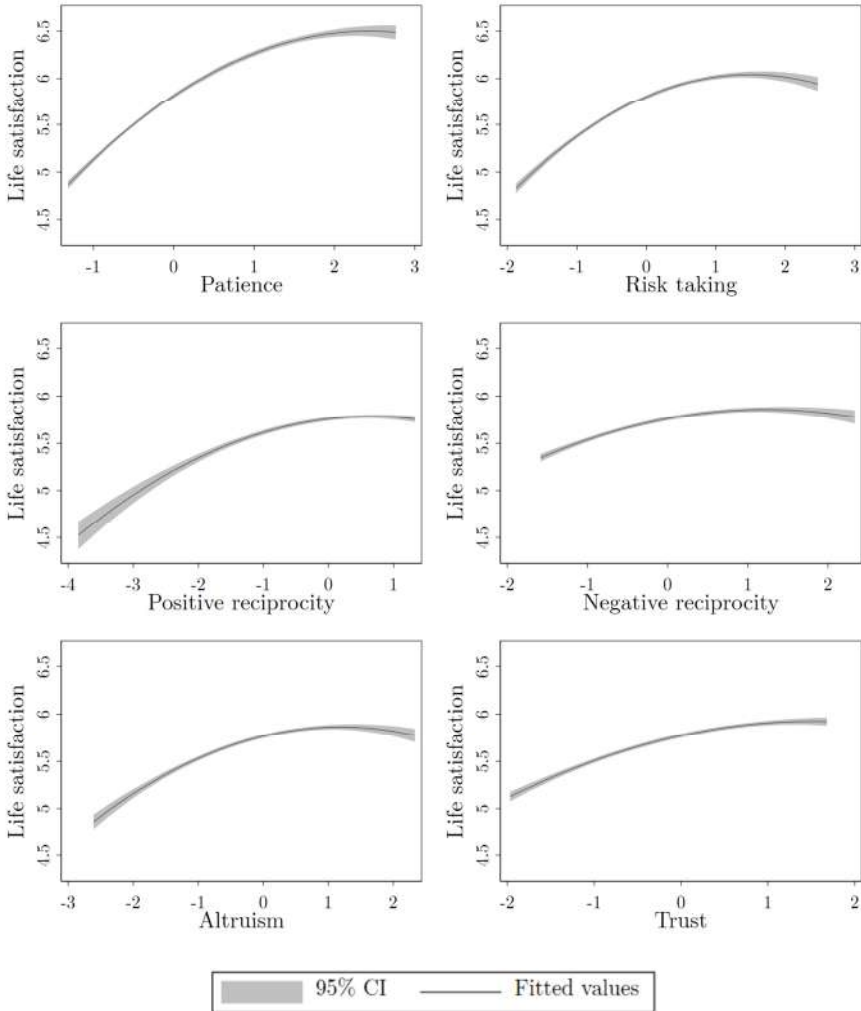
The quantitative interpretation of SWB results must consider the 10-point scale for the life satisfaction questions and the binary scale for affect questions. With this in mind, coefficients of evaluative and affective SWB tend to be similar in magnitude for all preferences with some minor differences. In some cases, the affective variables happiness and worry show a tendency of slightly lower correlations. Out of all three SWB variables, worry has the smallest coefficients of roughly half the size of happiness.

The control variables are significant as expected. Especially subjective math skills used as a proxy for cognitive ability are significantly and positively correlated with SWB but also with the preferences as reported in the original GPS paper (Falk et al., 2018). Gender is also highly significant. Comparing the size of effects, gender shows the strongest and most consistent effect, followed by subjective math skills. Interestingly, SWB correlations are somewhat comparable to and roughly half the size of the coefficients of gender and subjective math. The other control variables come out as expected with negative coefficients for unemployment and positive coefficients for education.

4.3 Life satisfaction

For an initial impression of the trends for preferences and SWB we provide quadratic fit plots. Figure 1 shows the quadratic fits of all the different preferences to life satisfaction. All of the graphs have a tendency to slope upwards with a slight hump shape. The quadratic fit of life satisfaction and negative reciprocity shows a somewhat flatter slope than the other variables.

Figure 1 Quadratic fit for all preferences and life satisfaction



This figure shows quadratic fit for life satisfaction and preferences. Dummy tests are included in Appendix G. The difference in scales on the x-axes derives from differences in values of the preference variable z-scores.

The regression results for life satisfaction can be found in Table 2. They confirm the positive coefficients of the quadratic fit figures but clarify that with the exception of patience and altruism, the quadratic variables are not significant once control variables are included. Life satisfaction is significantly correlated with patience. Risk taking is also significantly correlated with life satisfaction with a similar coefficient as patience. Positive and negative reciprocity have somewhat similar coefficients at 0.086 and 0.070. The results for positive and negative reciprocity imply that higher willingness to both reward good behaviour and punish unfair behaviour is associated with higher life satisfaction. In other words, being more willing to respond to actions from others, whether fair or unfair, correlates with higher life satisfaction. Altruism and trust are also significantly correlated with life satisfaction.

Table 2 Regressions of life satisfaction on preferences

<i>Variables</i>	<i>Life today (0–10)</i>
Patience	0.228*** (0.019)
Patience squared	−0.074*** (0.012)
Risk taking	0.225*** (0.016)
Risk taking squared	−0.018 (0.018)
Positive reciprocity	0.086*** (0.019)
Positive reciprocity squared	−0.013 (0.010)
Negative reciprocity	0.070*** (0.016)
Negative reciprocity squared	−0.016 (0.015)
Altruism	0.178*** (0.021)
Altruism squared	−0.016* (0.009)
Trust	0.131*** (0.015)
Trust squared	−0.009 (0.013)

Table 2 Regressions of life satisfaction on preferences (continued)

<i>Variables</i>	<i>Life today (0–10)</i>					
Constant	2.356*** (0.295)	2.260*** (0.296)	2.275*** (0.297)	2.247*** (0.302)	2.303*** (0.295)	2.220*** (0.305)
Observations	74,312	74,265	74,635	73,402	74,423	73,680
R-squared	0.271	0.275	0.268	0.268	0.272	0.270
No. of countries	73	73	73	73	73	73

Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

This table shows regression results related to investigating the correlation between life satisfaction and preferences. The regressions include all controls. These are gender, age, age squared, income, marital status, employment status and educational attainment. The regressions equation (2.1) and include country fixed effects.

4.4 Happiness

The quadratic fits for happiness all have the same tendency of sloping slightly upwards (Appendix D, Figure D1). Positive and negative reciprocity stand out in that their slope is slightly less clear. The lines tend to be straight with most curvature for patience and risk taking.

The regression results for happiness can be found in Table 3. They confirm the visual tendency of the quadratic fit graphs that patience and risk taking show the only significant quadratic components. With the exception of negative reciprocity that shows the only insignificant correlation among all the combinations of SWB and preference variables, all correlations are significant at the $p < 0.01$ level. The significant correlation coefficients are roughly similar in size ranging from 0.014 (patience) to 0.028 (altruism).

Table 3 Regressions of happiness on preferences

<i>Variables</i>	<i>Happiness (yes-no)</i>	
Patience	0.014*** (0.003)	
Patience squared	-0.005** (0.002)	
Risk taking	0.018*** (0.004)	
Risk taking squared	-0.004* (0.002)	
Positive reciprocity		0.018*** (0.004)
Positive reciprocity squared		-0.000 (0.002)
Negative reciprocity		-0.003 (0.003)

Table 3 Regressions of happiness on preferences (continued)

<i>Variables</i>	<i>Happiness (yes-no)</i>						
Negative reciprocity squared	0.000 (0.002)						
Altruism	0.028*** (0.003)						
Altruism squared	-0.001 (0.002)						
Trust	0.020*** (0.003)						
Trust squared	-0.003 (0.002)						
Constant	0.717*** (0.025)	0.716*** (0.024)	0.715*** (0.024)	0.713*** (0.026)	0.719*** (0.025)	0.710*** (0.025)	
Observations	72,145	72,101	72,464	71,281	72,269	71,538	
R-squared	0.112	0.113	0.113	0.111	0.115	0.113	
No. of countries	72	72	72	72	72	72	

Robust standard errors in parentheses,

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

This table shows regression results related to investigating the correlation between happiness and preferences. The regressions include all controls. These are gender, age, age squared, income, marital status, employment status and educational attainment. The regressions follow equation (2.1) and include country fixed effects.

4.5 Worry

The quadratic fits for worry all have the same tendency of sloping slightly downwards (Appendix D, Figure D2). The regression results for worry can be found in Table 4. Worry is correlated significantly (at least $p < 0.1$) with all the preference variables. With the notable exception of negative reciprocity, all correlations are negative. The coefficients range from -0.010 (risk taking and trust) to 0.006 (negative reciprocity).

Risk taking squared and trust squared are significant quadratic variables with minimums. Note that as explained above this risk-taking measure differs to taking personal health risks. Instead, it measures willingness to make risky decisions, such as decisions where higher risk means higher expected payoff but also higher uncertainty. Risk taking is thus also related to willingness to accept uncertainty, which would mean that greater acceptance of uncertainty correlates with higher SWB. Trust is also negatively related to worry and has a significant quadratic component. This implies that higher levels of trust are associated with higher levels of worry eventually, but only after a minimum point. Lastly, the quadratic variable for negative reciprocity is significant ($p < 0.1$) and has a positive sign meaning worry increases exponentially with negative reciprocity.

Table 4 Regressions of worry on preferences

<i>Variables</i>	<i>Worry (yes-no)</i>					
Patience	-0.008** (0.004)					
Patience squared	0.001 (0.002)					
Risk taking	-0.010*** (0.003)					
Risk taking squared	0.004** (0.002)					
Positive reciprocity	-0.007* (0.004)					
Positive reciprocity squared	-0.002 (0.002)					
Negative reciprocity	0.006** (0.003)					
Negative reciprocity squared	0.004* (0.002)					
Altruism	-0.008*** (0.002)					
Altruism squared	0.000 (0.002)					
Trust	-0.010*** (0.003)					
Trust squared	0.004** (0.002)					
Constant	0.378*** (0.032)	0.373*** (0.032)	0.385*** (0.031)	0.367*** (0.033)	0.380*** (0.032)	0.374*** (0.032)
Observations	73,378	73,328	73,716	72,458	73,501	72,721
R-squared	0.079	0.079	0.079	0.079	0.079	0.079
No. of countries	72	72	72	72	72	72

Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

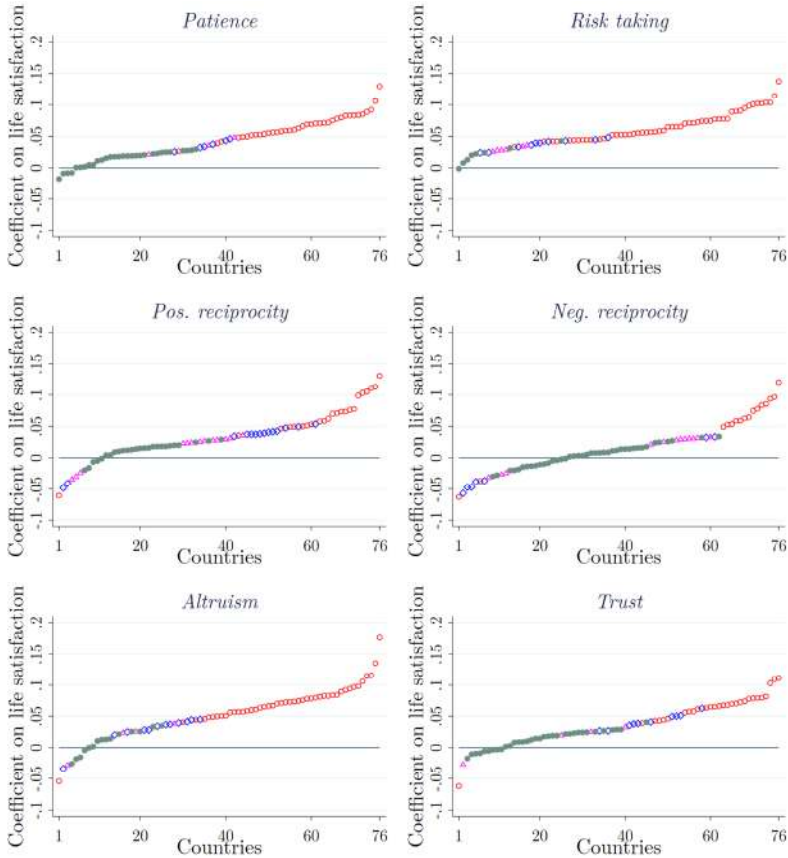
This table shows regression results related to investigating the correlation between worry and preferences. The regressions include all controls. These are gender, age, age squared, income, marital status, employment status and educational attainment. The regressions follow equation (2.1) and include country fixed effects.

4.6 Results from regional comparisons

The extent to which these correlations differ across regions of the world is a very interesting topic to pursue to scan for any regional differences in these overwhelmingly positive correlations. To that end, we plot two types of figures with a geographical component. One type shows regression coefficients by country sorted from lowest to highest coefficient. The other type plots the quadratic coefficients for the different preferences for each of seven regions of the world.

Figure 2 shows the results of regressions run by country to provide an overall impression of heterogeneity in correlation across countries. It demonstrates that the countries almost always have positive coefficients in common. This holds most strongly for patience and risk taking and less so for trust and altruism. The correlations for positive and negative reciprocity are most significantly negative out of all the preference variables. Nevertheless, one can conclude from the graphs that the phenomenon of positive correlation between preferences and SWB is spread rather equally throughout the world. The equivalent graphs for happiness and worry can be found in Appendix E and show similar tendencies.

Figure 2 Coefficients on life satisfaction compared across countries (see online version for colours)

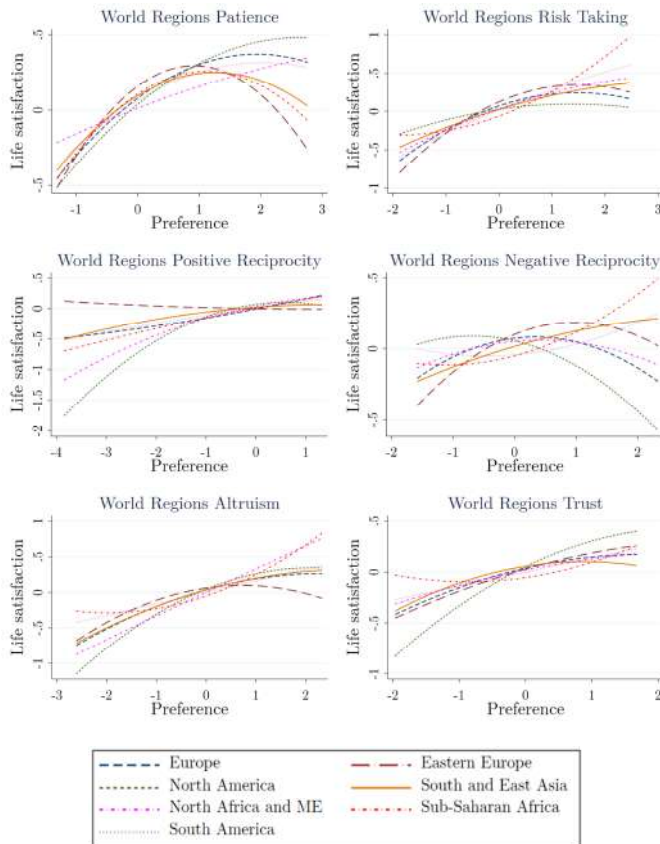


This figure shows regression results for life satisfaction and preferences by countries. The controls include the full controls set and the regressions are OLS regressions following equation (2.1). The shapes indicate significance as follows: solid grey circles are not significant, pink triangles are significant at the 10% level, blue diamonds are significant at the 5% level and empty red circles are significant at the 1% level.

Figure 3 shows the result of quadratic fits based on the residuals from a quadratic regression of life satisfaction on the respective preferences in seven regions of the world. The main result from those graphs is that the results are again quite homogenous and

usually positive across all of the world’s regions. There are a few regions and a few preference variables for which this holds somewhat less or differently. The regions that break out at times are North America and Sub-Saharan Africa. With the exception of risk-taking, the preference variables show stronger correlations in North America. For example, patience is more strongly correlated with life satisfaction in North America. Sub-Saharan Africa on the other hand often shows a weaker correlation and less curvature. The preferences that behave differently are negative and positive reciprocity where the differences are much larger between regions. The equivalent graphs for happiness and worry can be found in Appendix E.

Figure 3 Coefficients on life satisfaction compared across regions (see online version for colours)



This figure shows regression results for life satisfaction and preferences by regions. The controls include only subjective math skills, age, age squared and gender and the regressions are OLS regressions. Note also that the y-axis scales are different given that the emphasis is on within-graph and not between-graph comparison. North America is short for North America and Australia and includes the USA, Canada and Australia.

4.7 Further results

Further results can be found in the Appendix. Among others, the appendix shows results for some of the other SWB variables, demonstrating that although the main finding of

positive coefficients is quite stable, the preferences specific SWB variables relate to also differ between the variables. For example, enjoyment correlates with risk taking, altruism and trust, whereas smile or laugh also correlates with positive reciprocity. Between the SWB measures, future life satisfaction shows a tendency to be even more correlated with preferences than life satisfaction. In particular, the forward-looking correlations are higher for risk taking, positive reciprocity and altruism but not for patience, negative reciprocity and trust where the coefficients are roughly the same. Smile or laugh stands out as the variable that seems to be least correlated to the preferences among all SWB variables although it is still significantly correlated with risk taking, positive reciprocity, altruism and trust.

Splitting regressions by demographic subgroups uncovers some interesting variation in the correlations between SWB and preferences.⁵ For life satisfaction, the genders differ strongly in the correlation with patience, where the coefficient for the male subgroup is twice as large. The younger age group shows a larger coefficient for altruism. The below-median income group has a lower coefficient for trust. The non-married subgroup has higher correlations for patience, risk-taking and trust, but a lower coefficient for positive reciprocity. The employed subgroup shows lower coefficients for patience, risk taking and positive reciprocity. The no-college subgroup shows a lower coefficient for trust. The other correlations not mentioned here are largely similar.

5 Discussion

5.1 Literature comparison

The results in this paper are generally coherent with the literature. The results are similar to Giuliano and Sapienza (2020) where patience is positively related to SWB as well. Similarly, we find that there is a significant curvature in the correlation for patience and some other preferences (Giuliano and Sapienza, 2020). Work done by the authors of the GPS who run analyses on German Socio-Economic Panel (SOEP) data with life satisfaction and the preferences receive broadly the same positive correlations (Becker et al., 2012). Generally, the correlation between SWB and objective economic outcomes also tends to be positive, which supports our results (Lane, 2017).

Lastly, our results show that future life satisfaction is (almost) equally or more correlated to preferences than present life satisfaction (Appendix C). This is not an entirely new phenomenon in the literature. For example, Ward (2020) finds a difference in the correlation of voting and SWB where future life satisfaction is an even stronger correlate of voting patterns than present life satisfaction.

An interesting question is also whether the country-based coefficients align with any findings from the literature on inter-country differences in preference levels or other traits. Relevant research on this topic includes global results on civic honesty but also the findings on differences in preferences in the initial research with the GPS (Cohn et al., 2019; Falk et al., 2018). However, we did not find much overlap. Our coefficients also seem comparatively homogenous across countries. For example, the wallet return rates in the civic honesty experiments appear to differ much more than our coefficients, although the differing scales make exact comparisons difficult (Cohn et al., 2019).

5.2 *Interpretation*

Interestingly, one can see a clear trend in the relationship between preferences and SWB. The correlations indicate that all positive SWB variables correlate positively with preferences. In contrast, negative SWB variables show the opposite correlation. Therefore, the results show a strong and consistent dichotomy in the correlation with preferences between desirable and undesirable SWB variables. The negative SWB variables would be the group of undesirable affective states including sadness and worry. The positive SWB variables would be all other variables including life satisfaction, happiness and enjoyment.

All findings derived from our research have to be put into perspective by highlighting that the paper's empirical setup is purely correlational. By making policy recommendations and thinking about causal paths we make theoretical statements that are not necessarily supported by the results in our research. If we do assume a causal effect of preferences on SWB, we can argue that having stronger preferences is mostly beneficial. This would require that there are channels through which the preferences can affect SWB and that the positive channels outweigh the negative channels. More patient, risk taking, reciprocal, altruistic and trusting people would then tend to show higher SWB.

5.3 *Correlation vs. causation*

While we cannot rely on our results to argue about the causal direction of the effect, we can rely on theory and evidence from the literature. There are arguments and evidence in favour of both avenues. One notable difference is that the (causal) literature on the causal role of SWB is much bigger than that for preferences. This could be due to the nature of the two concepts and difficulties with the manipulation of preferences while inducing (affective) SWB is commonplace. The link between preferences and SWB on the other hand is mostly supported by correlational work on channels that might indicate such an effect rather than causal experiments or research. The channels that are at work likely differ between the different preference and SWB variable pairs. Meanwhile, the significant extent of geographical homogeneity in the results indicates that there are some similarities in the relationships of preferences and SWB across different regions.

On the one hand, there is some research pointing to preferences as the causal factor. Examples of such research include findings on how preferences strongly correlate with economic outcomes, which holds not just over a lifetime but also across generations (Sunde et al., 2022). Better economic outcomes could in turn raise SWB (Diener et al., 2018). Another famous example is the marshmallow experiment that suggested that patience in kindergarten or the act of foregoing immediate consumption of a marshmallow correlated with success later in life (Shoda et al., 1990).⁶ Furthermore, research on (the act of) altruism argues around the good and the bad implications of altruism for SWB and points to a positive relationship (Falk and Graeber, 2020; Lok and Dunn, 2020).

On the other hand, experiments have also shown a causal link between SWB variables and preferences. For example, happiness increased patience in a field experiment (Ifcher and Zarghamee, 2011). Positive reciprocity increased with better mood (Kirchsteiger et al., 2006). Moreover, negative emotions increased negative reciprocity in a lab experiment (Bosman and van Winden, 2002). Affective SWB also

changes risk attitudes and patience in a study with a causal identification mechanism based on panel data (Meier, 2022). However, there are also papers that find weak or ambiguous effects when trying to examine the causal link between SWB and preferences. One example of such a paper looks at the effect of sadness on risk taking (Treffers et al., 2016). One wonders whether the preferences as measured in these experiments are similar to the preferences in our paper. However, this seems highly likely given that they are both measured in similar ways and by relying on the same type of experiments. This suggests that SWB does play a role in determining preferences.

5.4 Contribution

In attempting to answer the research question in what way preferences and SWB are correlated, the main contribution of this paper is as follows. To our knowledge, this is the only paper providing an in-depth examination of the correlation of preferences on SWB by combining the GPS and the GWP. Thus, we are among the first to use the biggest and most exhaustive dataset on preferences that is currently available (Falk et al., 2018). The only other paper to do so focused on patience alone (Giuliano and Sapienza, 2020).

Moreover, our findings add to the literature on determinants of SWB. A lot of research examines the important question of what determines SWB (Diener et al., 2018). The literature has so far focused on other behavioural concepts such as personality measures. Using these behavioural variables is of great importance because a lot of a person's SWB is explained by fixed traits, part of which could be measurable with preferences (Ferrer-i-Carbonell and Frijters, 2004). However, there is a gap in the literature around the relationship of preferences with SWB. Preferences promise insights on the role of concrete behavioural attitudes for SWB. Although there are papers that have previously related similar concepts to SWB, preferences are unique in being experimentally validated and offering information distinct from other behavioural variables (Becker et al., 2012; Falk et al., 2023). The only previous papers we are aware of that examined these exact preference measures and SWB did so for life satisfaction or patience only (Becker et al., 2012; Giuliano and Sapienza, 2020).

In this new space, we use regressions on previously unused global data. Our main finding is that greater SWB is usually associated with stronger preferences. This principle holds remarkably stable across the preferences. Negative SWB variables such as worry tend to correlate negatively with preferences showing opposite behaviour to the positive SWB variables. Our findings are also significant in providing insights on a global scale relying on the breadth of variables as provided by the GWP combined with the GPS.

6 Limitations and extensions

There are a few standard limitations to think about for a quantitative study based on secondary data such as this one. Fortunately, the GWP has few missing values and a thorough polling strategy, thus avoiding some of the potential shortcomings of comparable data (Gallup, 2012).

However, the combination of two sets of subjective or semi-subjective variables raises questions. Many research settings usually involve one subjective side at most. Both concepts in this study are tried and tested (Falk et al., 2018; Giuliano and Sapienza, 2020). Nevertheless, some concerns regarding scale use remain: it could be the case that

certain groups of people simply answer more generously on subjective scales. The fact that preferences also contain an experimental component (to differing degrees) weakens this concern substantially. The preferences are thus not only subjective but also measure actual behaviour in observed and controlled scenarios.

Multicollinearity affects the regressions that include all the preferences at once, since the preferences are correlated among each other (Falk et al., 2018). Nevertheless, the results are broadly stable and tend to be weaker in the all-inclusive table than when included on their own without other preferences. The results shown in those all-inclusive tables are more credible for it (Appendix C).

The data are cross-sectional since participants only took part once in the year 2012. One can therefore only make inter-personal comparisons at one point in time rather than observing within-person change over some period as would be the case with panel data.

Lastly, this study is purely correlational in everything it reports. That implies among other things that one does not know which way the direction of causality runs between SWB and a preference. Although this varies between preferences, the literature usually provides evidence for both directions of causality in each preference – SWB relationship (Lane, 2017). Naturally, reverse causality is also an issue when looking at one direction of the correlation as done in this paper. If the causal effects for both directions are positive as can be assumed based on the literature, the estimates we provide are likely inflated. Nevertheless, even reverse causality inflating the effect by as much as 50% would still imply serious effects.

These limitations logically also point to sensible extensions of this research. Causality needs further addressing. This requires identification strategies with more granular data.

7 Conclusion

We use a global sample to test the correlation between SWB and a set of experimentally validated preference measures. SWB measures include evaluative measures (life satisfaction, life satisfaction in five years) and affective measures (happiness, sadness, enjoyment, smile or laugh and worry). Preferences include patience, risk taking, positive and negative reciprocity, altruism and trust. We contribute to the literature by providing results on this large group of preferences based on global data. The main result is that regressions indicate that the relationship between SWB and preferences tends to be positive. Correspondingly, negative SWB variables like worry tend to show negative correlation with the preferences. This finding is remarkably stable across the world.

A potential lesson for stakeholders such as businesses and governments could be to promote initiatives that build stronger preferences in order to increase wellbeing. Initiatives that make people more patient, risk taking, reciprocal, altruistic and trusting could all bear the promise of also increasing wellbeing.

Acknowledgements

We are grateful to Gallup for use of the World Poll data. We thank seminar participants at the STATEC Well-being 2022 conference for helpful comments and discussions. This work was supported by the Economic and Social Research Council grant number ES/P000649/1.

Author's contribution

K.O. and J-E.D.N. designed the research. K.O. analysed the data. K.O. wrote the manuscript and K.O. and J-E.D.N. reviewed it.

Data and materials availability

The data for the Global Preferences Survey can be downloaded at <https://gps.econ.uni-bonn.de/downloads>. The GWP data belong to the Gallup Organization. The data are made available by the Gallup Organization for a fee. For more information, see <https://www.gallup.com/analytics/318875/global-research.aspx>.

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Notes

- ¹Note that risk taking means accepting uncertainty about future rewards rather than personal health risks in this context.
- ²We follow conventions in the literature with this approach (Becker et al., 2012; Ferrer-i-Carbonell and Frijters, 2004).
- ³Or negatively in the case of negative SWB (worry) as the opposite case.
- ⁴Life satisfaction in five years, sadness, smile and enjoyment are also available and included in Appendix. In addition, the appendix also shows results for three relevant indices: the life experience index for the two life satisfaction questions and the positive and negative experience indices for the other variables.
- ⁵These results were withheld from paper and appendix for brevity purposes but are available on request.
- ⁶The result sizes in this paper are smaller in replications (Watts et al., 2018).

Appendix A: Data and survey questions

The Global Preferences Survey data were run as part of the Gallup World Poll 2012 (Falk et al., 2018). The questions are based on the preference module, an experimentally validated set of questions to elicit economic preferences (Falk et al., 2023). Each question consists of different inputs that are weighed specifically, and the weights are given at the beginning of each line for each of the items.

Any willingness to act item had the following introduction:

"We now ask for your willingness to act in a certain way in four different areas. Please again indicate your answer on a scale from 0 to 10, where 0 means "completely unwilling to do so" and a 10 means you are "very willing to do so". You can also use any numbers between 0 and 10 to indicate where you fall on the scale, like 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10." (Falk et al., 2018)

Any self-assessment item was preceded by the following introduction:

"How well do the following statements describe you as a person? A 0 means "does not describe me at all" and a 10 means "describes me perfectly". Please indicate your answer on a scale from 0 to 10. You can also use any numbers between 0 and 10 to indicate where you fall on the scale, like 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10." (Falk et al., 2018)

Table A1 Variable descriptions for preference variables

<i>Variable</i>	<i>Description</i>	<i>Weight</i>
Patience	Experiment: Intertemporal choice sequence using staircase method (Falk et al., 2018)	0.712
	“(Willingness to act:) How willing are you to give up something that is beneficial for you today in order to benefit more from that in the future?” (Falk et al., 2018)	0.288
Risk taking	Experiment: Lottery choice sequence using staircase method (Falk et al., 2018)	0.473
	“Please tell me, in general, how willing or unwilling you are to take risks. Please use a scale from 0 to 10, where 0 means “completely unwilling to take risks” and a 10 means you are “very willing to take risks”. You can also use any numbers between 0 and 10 to indicate where you fall on the scale, like 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.” (Falk et al., 2018)	0.527
Positive reciprocity	Hypothetical situation: Gift in exchange for help (Falk et al., 2018)	0.515
	“(Self-assessment:) When someone does me a favour I am willing to return it” (Falk et al., 2018)	0.485
Negative reciprocity	“(Self-assessment:) If I am treated very unjustly, I will take revenge at the first occasion, even if there is a cost to do so.” (Falk et al., 2018)	0.374
	“(Willingness to act:) How willing are you to punish someone who treats you unfairly, even if there may be costs for you? (Falk et al., 2018)	0.313
	“(Willingness to act:) How willing are you to punish someone who treats others unfairly, even if there may be costs for you?” (Falk et al., 2018)	0.313
Altruism	“(Hypothetical situation:) Imagine the following situation: Today you unexpectedly received 1000 Euro. How much of this amount would you donate to a good cause? (Values between 0 and 1000 are allowed.)” (Falk et al., 2018)	0.635
	“(Willingness to act:) How willing are you to give to good causes without expecting anything in return?” (Falk et al., 2018)	0.365
Trust	“(Self-assessment:) I assume that people have only the best intentions” (Falk et al., 2018)	1

Subjective Math Skills. “How well do the following statements describe you as a person? Please indicate your answer on a scale from 0 to 10. A 0 means “does not describe me at all” and a 10 means “describes me perfectly”. I am good at math.” (Falk et al., 2023).

The Gallup questions follow the standard Gallup scheme and get matched to the Global Preferences Survey data based on their common identification number.

Life Today (Life Satisfaction). “Please imagine a ladder with steps numbered from zero at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?” (Gallup, 2012).

Life in five years (Life satisfaction). “Please imagine a ladder with steps numbered from zero at the bottom to 10 at the top. The top of the ladder represents the best possible life

for you and the bottom of the ladder represents the worst possible life for you. On which step do you think you will stand about five years from now?" (Gallup, 2012).

Happiness. "Did you experience the following feelings during a lot of the day yesterday? How about happiness?" 0-No, 1-Yes (Gallup, 2012).

Sadness. "Did you experience the following feelings during a lot of the day yesterday? How about sadness? 0-No, 1-Yes" (Gallup, 2012).

Smile. "Did you smile or laugh a lot yesterday? 0-No, 1-Yes" (Gallup, 2012).

Enjoyment. "Did you experience the following feelings during a lot of the day yesterday? How about enjoyment? 0-No, 1-Yes" (Gallup, 2012).

Worry. "Did you experience the following feelings during a lot of the day yesterday? How about worry? 0-No, 1-Yes" (Gallup, 2012).

Education. "What is your highest completed level of education? 0-Less than high school diploma, 1-High school degree or diploma, 2-Technical/Vocational school, 3-Some college, 4-College graduate, 5-Post graduate work or degree" (Gallup, 2012).

Gender. "What is your gender? 0-female, 1-male" (Gallup, 2012).

Married. "What is your current marital status? 0-Single/Never been married, 1-Married, 0-Separate, 0-Divorced, 0-Widowed, 1-Domestic partner" (Gallup, 2012).

Employment. "Employment. 1-Full time, 1-Full time self, 1-Part time do not want full time, 0-Unemployed, 0-Part time want full time, 0-Not in work force" (Gallup, 2019).

Income. Current household income in international dollars (Gallup, 2012)..

Life evaluation index. Based on Gallup's Thriving measure sectioning Life Today and Life In Five Years into Thriving = 1 (7,8,9,10/8,9,10), Struggling = 2 (5,6/5,6,7) and Suffering = 3 (0,1,2,3,4). (Gallup, 2012).

Positive experience index. Index based on positive affect variables from 0–100. These variables include enjoyment, laughing or smiling, feeling well-rested, being treated with respect and learning or doing something interesting. (Gallup, 2012).

Well rested. "Did you feel well-rested yesterday?" (Gallup, 2012).

Respect. "Were you treated with respect all day yesterday?" (Gallup, 2012).

Learning something interesting. "Did you learn or do something interesting yesterday?" (Gallup, 2012).

Negative experience index. Index based on negative affect variables from 0–100. These variables include physical pain, sadness, worry, stress and anger. (Gallup, 2012).

Physical pain. "Did you experience the following feelings during a lot of the day yesterday? How about physical pain?" (Gallup, 2012).

Stress. "Did you experience the following feelings during a lot of the day yesterday? How about stress?" (Gallup, 2012).

Anger. "Did you experience the following feelings during a lot of the day yesterday? How about anger?" (Gallup, 2012).

Appendix B: correlation matrix

Table B1 Correlation matrix for the main variables

	<i>Patience</i>	<i>Risk tak</i>	<i>Pos reci</i>	<i>Neg reci</i>	<i>Altruism</i>	<i>Trust</i>	<i>Life T-y</i>	<i>Fut Life</i>	<i>Happ-s</i>	<i>Sadness</i>	<i>Life E-n</i>	<i>Positi-e</i>	<i>Negati-e</i>
<i>Patience</i>	1.0000												
<i>Risk taking</i>	0.1932*	1.0000											
<i>Pos recip</i>	0.0737*	0.0340*	1.0000										
<i>Neg recip</i>	0.1189*	0.2138*	0.0013	1.0000									
<i>Altruism</i>	0.0780*	0.0921*	0.3825*	0.0558*	1.0000								
<i>Trust</i>	0.0607*	0.0389*	0.1386*	0.0912*	0.1647*	1.0000							
<i>Life Today</i>	0.1825*	0.1262*	0.0607*	0.0621*	0.0731*	0.0856*	1.0000						
<i>Fut Life</i>	0.1424*	0.1991*	0.0695*	0.0515*	0.1087*	0.0444*	0.6736*	1.0000					
<i>Happiness</i>	0.0676*	0.0683*	0.0565*	-0.0035*	0.0816*	0.0548*	0.2208*	0.2392*	1.0000				
<i>Sadness</i>	-0.0615*	-0.0558*	-0.0181*	0.0074*	-0.0172*	-0.0125*	-0.1811*	-0.1851*	-0.3044*	1.0000			
<i>Life Evalu-n</i>	0.1722*	0.1549*	0.0691*	0.0540*	0.0931*	0.0727*	0.8026*	0.7886*	0.2252*	-0.1803*	1.0000		
<i>Positive e-e</i>	0.0820*	0.1060*	0.0503*	0.0035*	0.0848*	0.0695*	0.2738*	0.2949*	0.5384*	-0.3157*	0.2764*	1.0000	
<i>Negative e-e</i>	-0.0671*	-0.0520*	-0.0050*	0.0312*	-0.0152*	-0.0208*	-0.2063*	-0.2088*	-0.3528*	0.7182*	-0.2006*	-0.4038*	1.0000

This table shows a correlation matrix for correlations between the main variables to investigate their basic correlation. The variables are explained in Appendix A. * indicates significance at the 0.05 level.

Appendix C: overview regression**Table C1** Subjective wellbeing variables regressed on preferences

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Variables</i>	<i>Life Today</i> (0–10)	<i>Life in</i> <i>Five Years</i> (0)	<i>Happiness</i> (yes-no)	<i>Sadness</i> (yes-no)	<i>Smile or</i> <i>Laugh</i> (yes-no)	<i>Enjoyment</i> (yes-no)	<i>Worry</i> (yes-no)
Patience	0.101*** (0.012)	0.090*** (0.014)	0.004** (0.002)	-0.006*** (0.002)	-0.000 (0.003)	0.006*** (0.002)	-0.006** (0.003)
Risk taking	0.183*** (0.016)	0.243*** (0.015)	0.015*** (0.004)	-0.005* (0.003)	0.017*** (0.004)	0.018*** (0.003)	-0.009*** (0.003)
Positive rec	0.031* (0.016)	0.085*** (0.018)	0.007* (0.004)	-0.009** (0.004)	0.008* (0.004)	0.001 (0.003)	-0.001 (0.004)
Negative rec	0.012 (0.016)	0.009 (0.017)	-0.009*** (0.003)	0.014*** (0.002)	-0.005 (0.004)	-0.007** (0.003)	0.010*** (0.003)
Altruism	0.132*** (0.019)	0.160*** (0.017)	0.022*** (0.003)	-0.004 (0.002)	0.018*** (0.004)	0.021*** (0.003)	-0.005** (0.002)
Trust	0.097*** (0.013)	0.079*** (0.015)	0.016*** (0.003)	-0.007*** (0.002)	0.015*** (0.003)	0.017*** (0.003)	-0.009*** (0.003)
Constant	2.340*** (0.296)	4.142*** (0.279)	0.726*** (0.024)	0.276*** (0.027)	0.537*** (0.028)	0.636*** (0.030)	0.359*** (0.032)
Observations	71,996	67,223	69,927	70,953	70,272	70,580	71,005
R-squared	0.283	0.266	0.116	0.079	0.097	0.092	0.080
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of countries	73	73	72	72	72	72	72

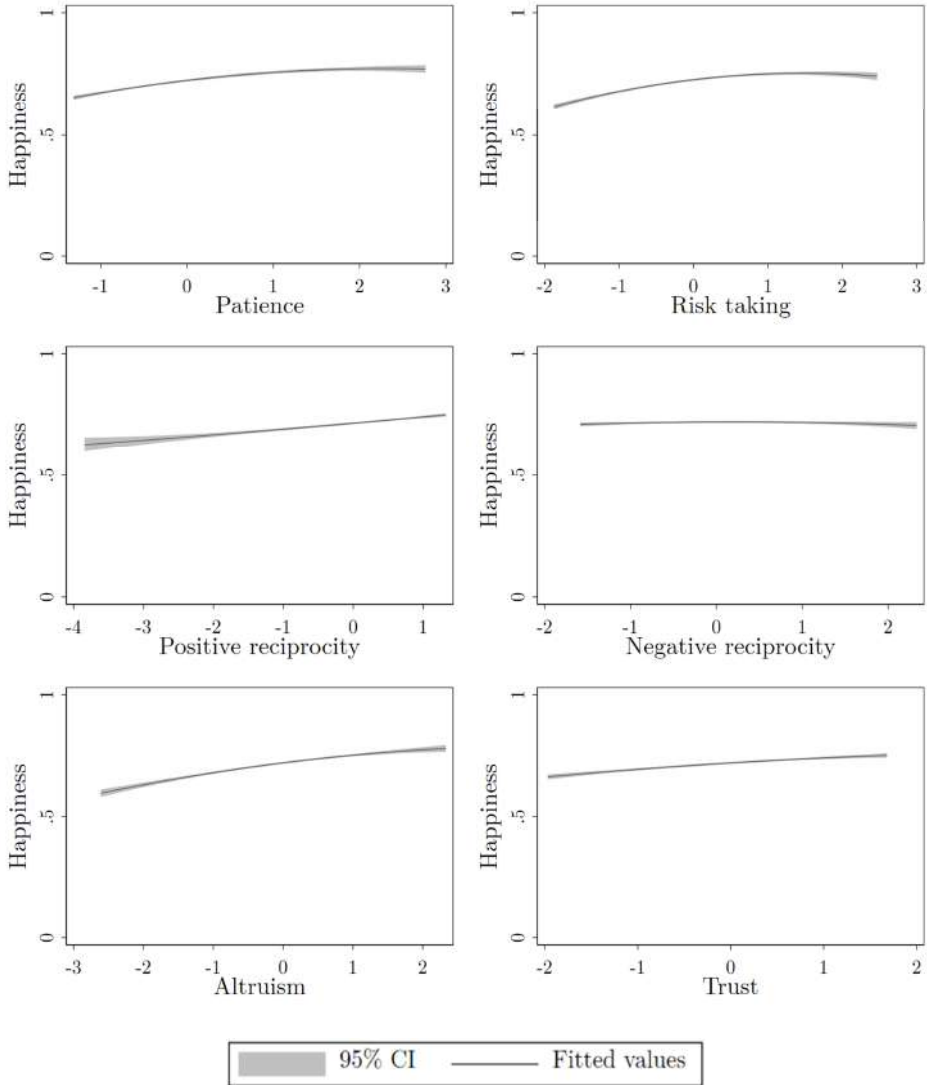
Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Note: This table shows regression results related to investigating the correlation between subjective wellbeing variables and preferences. The regressions include all controls. These are gender, age, age squared, income, marital status, employment status and educational attainment. The regressions follow equation (2.1).

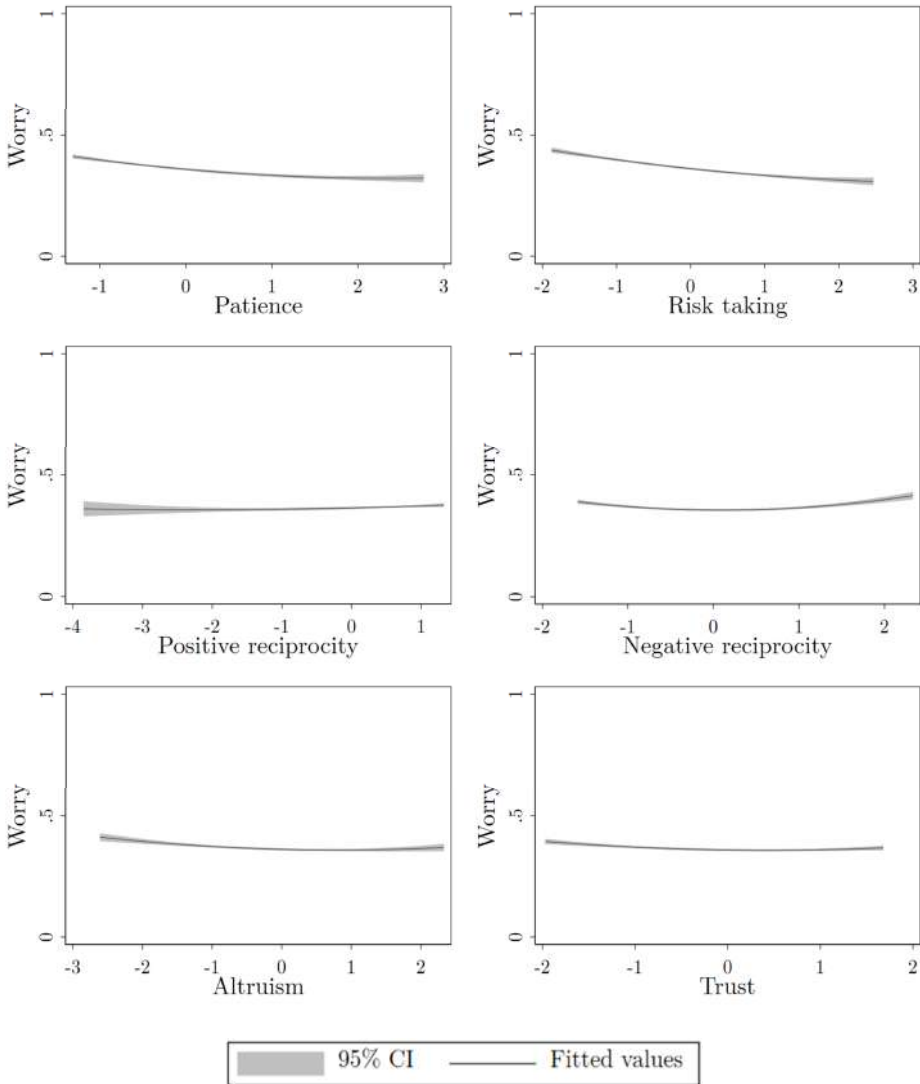
Appendix D: Quadratic fit graphs

Figure D1 Quadratic fit for all preferences and happiness



This figure shows quadratic fit for worry and preferences. The difference in scales on the x-axes derives from differences in values of the preference variable z-scores.

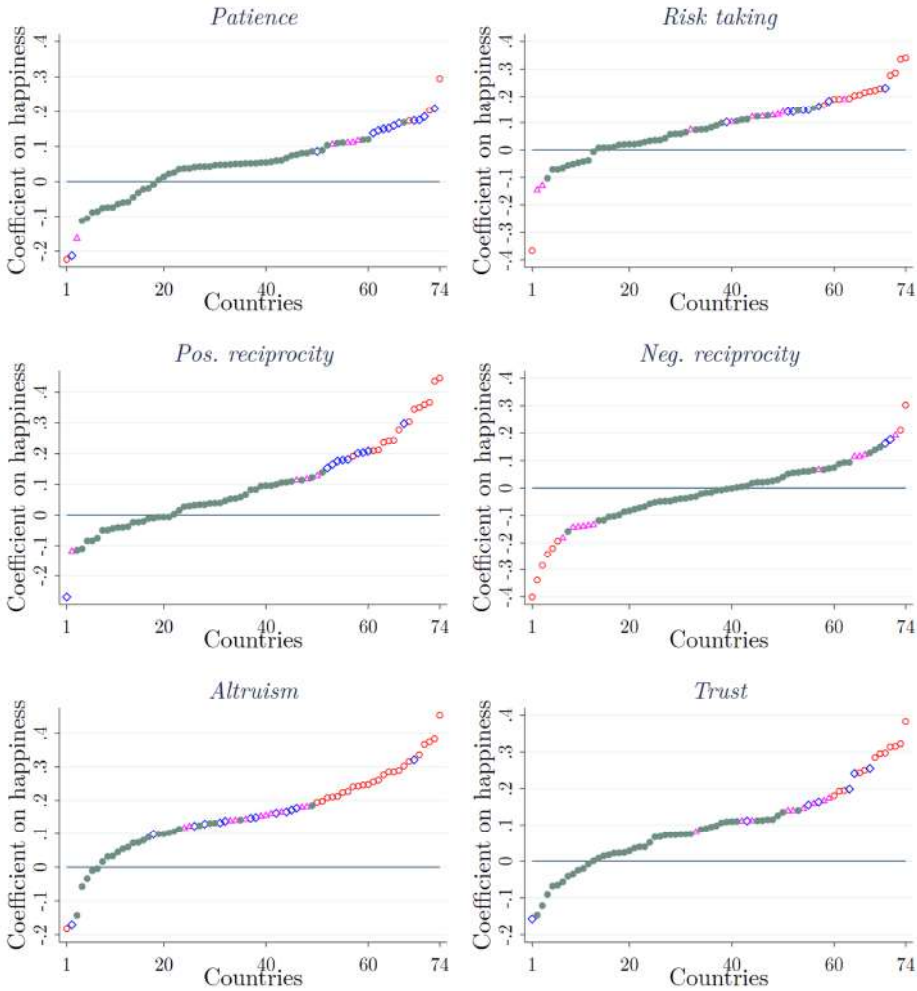
Figure D2 Quadratic fit for all preferences and worry



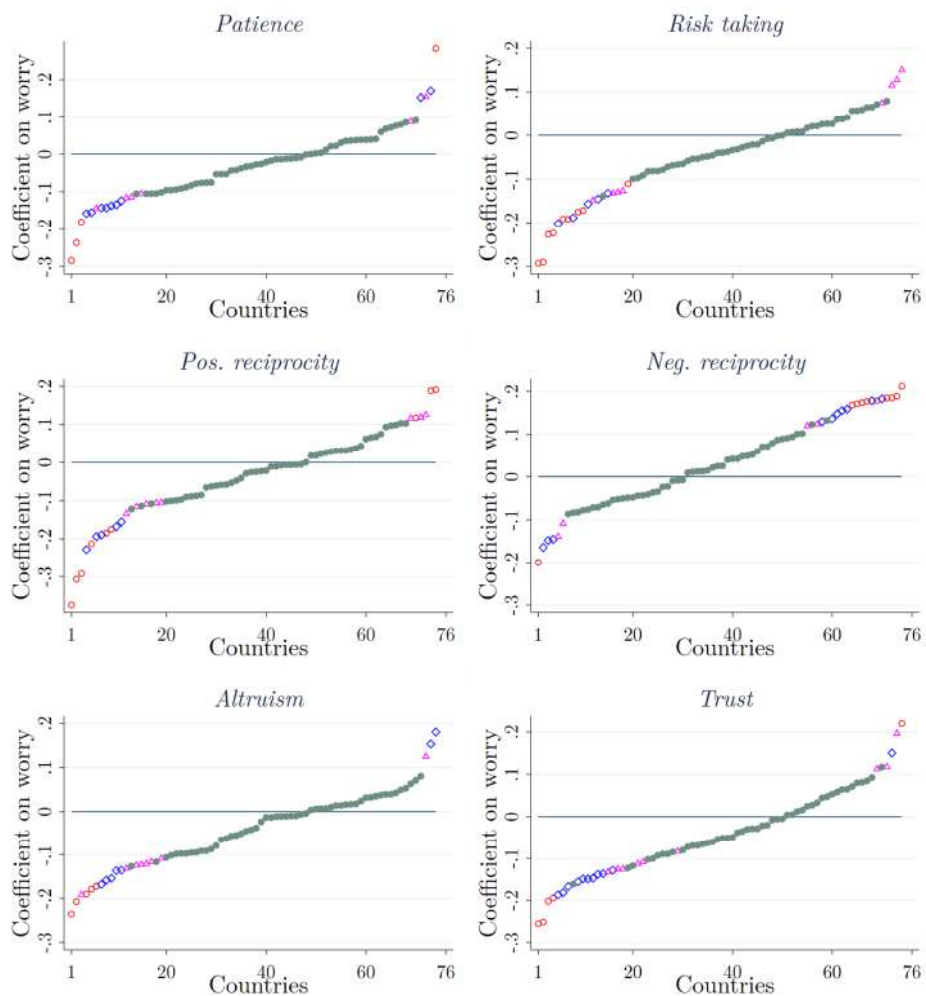
This figure shows quadratic fit for worry and preferences. The difference in scales on the x-axes derives from differences in values of the preference variable z-scores.

Appendix E: additional figures

Figure E1 Coefficients on happiness compared across countries (see online version for colours)

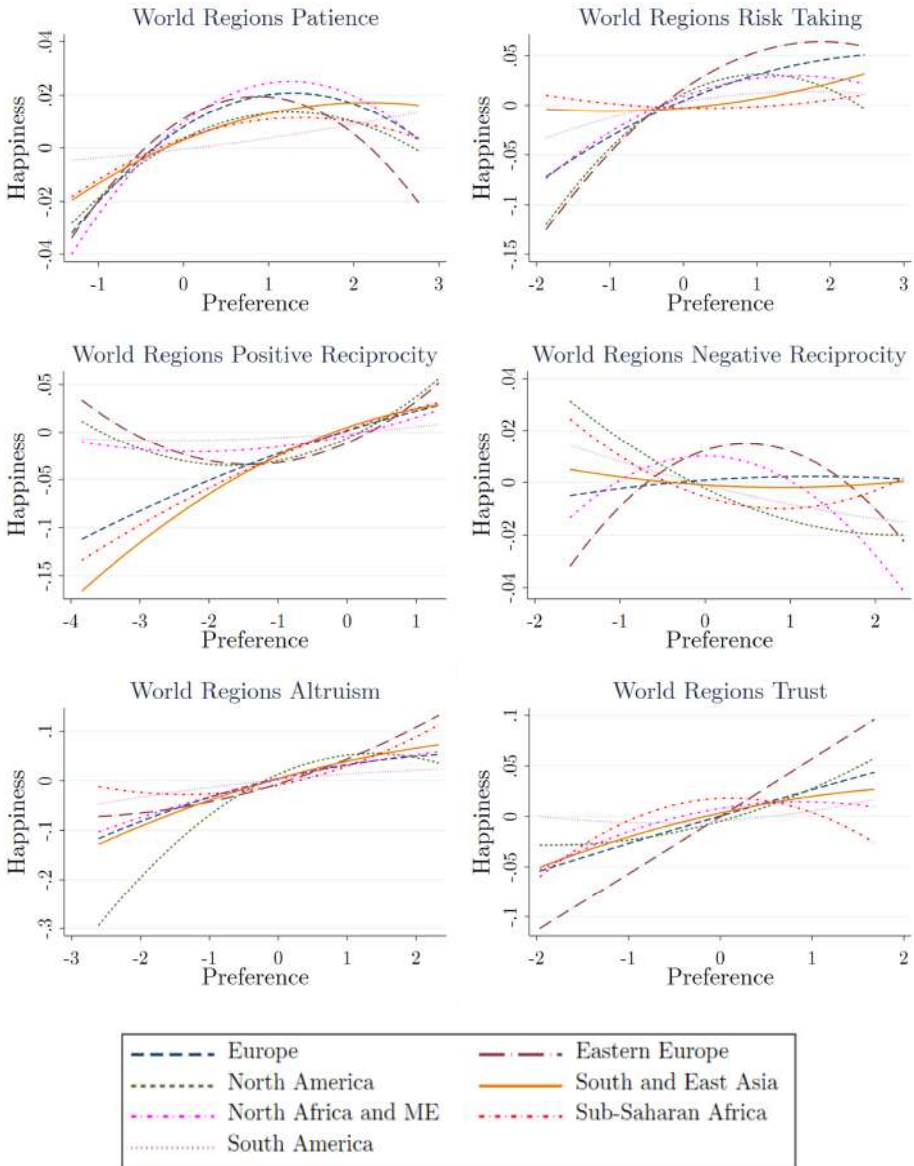


This figure shows regression results for happiness and preferences by countries. The controls include the full controls set and the regressions are OLS regressions following equation (2.1). The shapes indicate significance as follows: solid grey circles are not significant, pink triangles are significant at the 10% level, blue diamonds are significant at the 5% level and empty red circles are significant at the 1% level.

Figure E2 Coefficients on worry compared across countries (see online version for colours)

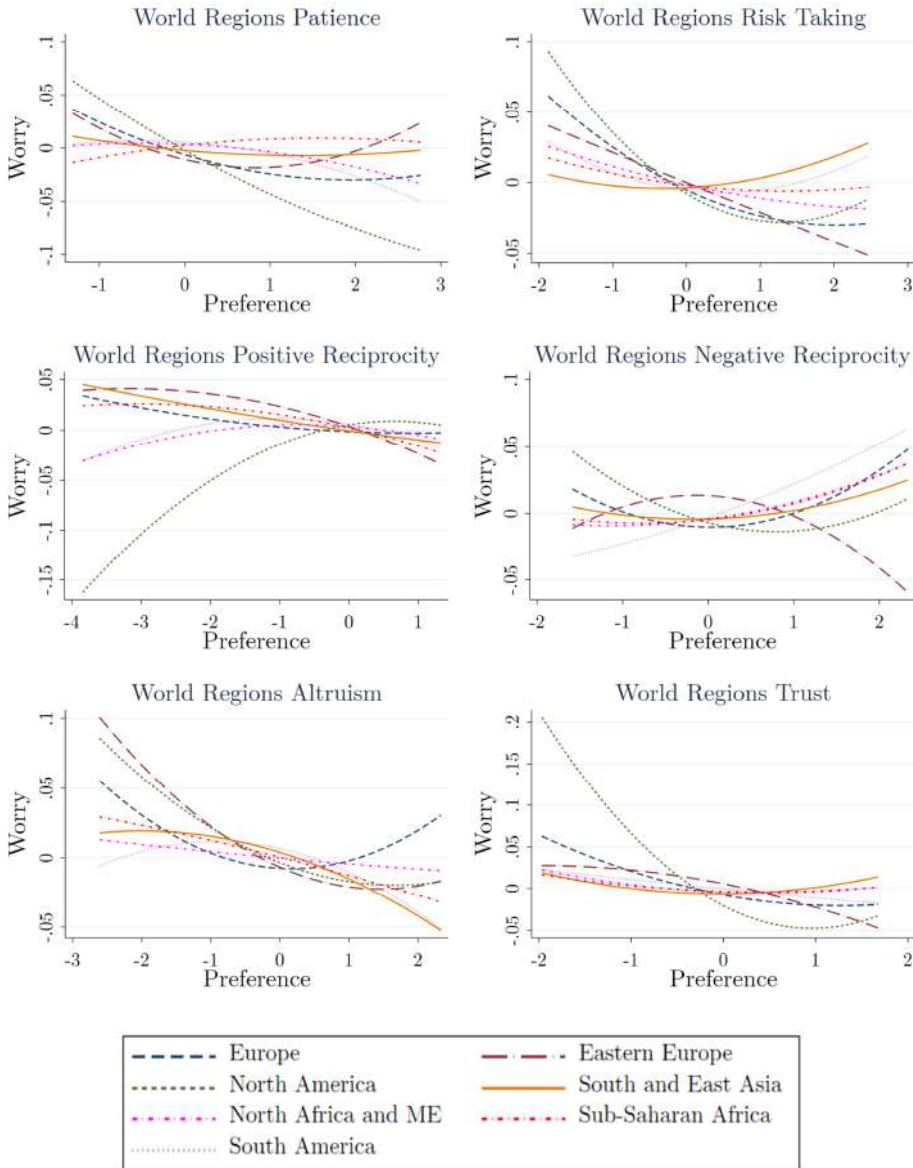
This figure shows regression results for worry and preferences by countries. The controls include the full controls set and the regressions are OLS following equation (2.1). The shapes indicate significance as follows: solid grey circles are not significant, pink triangles are significant at the 10% level, blue diamonds are significant at the 5% level and empty red circles are significant at the 1% level.

Figure E3 Coefficients on happiness compared across regions (see online version for colours)



This figure shows regression results for happiness and preferences by regions. The controls include only subjective math skills, age, age squared and gender and the regressions are OLS regressions. Note also that the y-axis scales are different given that the emphasis is on within-graph and not between-graph comparison. North America is short for North America and Australia and includes the USA, Canada and Australia.

Figure E4 Coefficients on worry compared across regions (see online version for colours)



This figure shows regression results for worry and preferences by regions. The controls include only subjective math skills, age, age squared and gender and the regressions are OLS regressions. Note also that the y-axis scales are different given that the emphasis is on within-graph and not between-graph comparison. North America is short for North America and Australia and includes the USA, Canada and Australia.

Appendix F: further overview regressions

Table F1 Regression of subjective wellbeing (SWB) variables on preferences

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Variables	Life Today (0-10)	Life in Five Years (0-10)	Life Evaluation Index (1-3)	Happiness (yes-no)	Sadness (yes-no)	Smile or Laugh (yes-no)	Enjoyment (yes-no)	Worry (yes-no)	Positive Experience Index (0-100)	Negative Experience Index (0-100)
Patience	0.101*** (0.012)	0.090*** (0.014)	0.027*** (0.003)	0.004** (0.002)	-0.006*** (0.002)	-0.000 (0.003)	0.006*** (0.002)	-0.006** (0.003)	0.586*** (0.150)	-0.449** (0.181)
Risk taking	0.183*** (0.016)	0.243*** (0.015)	0.057*** (0.004)	0.015*** (0.004)	-0.005* (0.003)	0.017*** (0.004)	0.018*** (0.003)	-0.009*** (0.003)	1.535*** (0.242)	-0.443* (0.242)
Positive rec.	0.031* (0.016)	0.085*** (0.018)	0.014*** (0.004)	0.007* (0.004)	-0.009** (0.004)	0.008* (0.004)	0.001 (0.003)	-0.001 (0.004)	0.416* (0.248)	-0.478 (0.352)
Negative rec.	0.012 (0.016)	0.009 (0.017)	-0.002 (0.004)	-0.009*** (0.003)	0.014*** (0.002)	-0.005 (0.004)	-0.007** (0.003)	0.010*** (0.003)	-0.491** (0.230)	1.621*** (0.209)
Altruism	0.132*** (0.019)	0.160*** (0.017)	0.038*** (0.005)	0.022*** (0.003)	-0.004 (0.002)	0.018*** (0.004)	0.021*** (0.003)	-0.005** (0.002)	1.519*** (0.201)	-0.371** (0.180)
Trust	0.097*** (0.013)	0.079*** (0.015)	0.024*** (0.003)	0.016*** (0.003)	-0.007*** (0.002)	0.015*** (0.003)	0.017*** (0.003)	-0.009*** (0.003)	1.404*** (0.175)	-0.967*** (0.209)
Constant	2.340*** (0.296)	4.142*** (0.279)	1.425*** (0.070)	0.726*** (0.024)	0.276*** (0.027)	0.537*** (0.028)	0.636*** (0.030)	0.359*** (0.032)	55.250*** (2.005)	28.701*** (2.243)
Observations	71,996	67,223	67,131	69,927	70,953	70,272	70,580	71,005	71,476	71,476
R-squared	0.283	0.266	0.252	0.116	0.079	0.097	0.092	0.080	0.143	0.107
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of countries	73	73	73	72	72	72	72	72	72	72

Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

This table shows regression results related to investigating the correlation between subjective wellbeing variables and preferences. The regressions include all controls. These are gender, age, age squared, income, marital status, employment status and educational attainment. The regressions follow equation (2.1).

Appendix G: Dummy regressions

Table G1 Regressions for life satisfaction with dummy variables for the preference variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Life Today</i> (0–10)	<i>Life Today</i> (0–10)	<i>Life Today</i> (0–10)	<i>Life Today</i> (0–10)	<i>Life Today</i> (0–10)	<i>Life Today</i> (0–10)
Patience = 1	0.309*** (0.026)					
Patience = 2	0.373*** (0.030)					
Risk taking = 1		0.345*** (0.032)				
Risk taking = 2		0.460*** (0.033)				
Pos. reciprocity = 1			0.193*** (0.037)			
Pos. reciprocity = 2			0.203*** (0.037)			
Neg. reciprocity = 1				0.080** (0.032)		
Neg. reciprocity = 2				0.180*** (0.038)		
Altruism = 1					0.267*** (0.034)	
Altruism = 2					0.396*** (0.050)	
Trust = 1						0.162*** (0.027)
Trust = 2						0.328*** (0.030)
Constant	2.015*** (0.298)	1.961*** (0.293)	2.127*** (0.299)	2.140*** (0.303)	2.056*** (0.301)	2.061*** (0.303)
Observations	74,312	74,265	74,635	73,402	74,423	73,680
R-squared	0.271	0.274	0.268	0.268	0.271	0.270
No. of countries	73	73	73	73	73	73

Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

This table shows regression results related to investigating the correlation between subjective wellbeing variables and preferences. The regressions include all controls. These are gender, age, age squared, income, marital status, employment status and educational attainment. The regressions follow equation (2.1). They modify the form of equation (2.1) by transforming the preference variables into dummies with three groups respectively. These dummies are included in the regression as explanatory variables with group 0 omitted as the baseline.