Is Happiness the Best Measure of Well-Being?

Andrew E. Clark[1] (Paris School of Economics - CNRS)

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[1] PSE, 48 Boulevard Jourdan, 75014 Paris, France; Andrew.Clark@ens.fr. I am grateful to Richard Layard, Ewen McKinnon, Andrew Oswald and Bert Van Landeghem for help and advice. Thanks to seminar participants at ESRI (Tokyo), the 2012 ISFOL Conference on Recognizing the Multiple Dimensions of Poverty (Rome), and the OECD-NAS workshop (Paris) for thoughtful comments. The Norwegian Social Science Data Services (NSD) is the data archive and distributor of the ESS data. Data from the British Household Panel Survey (BHPS) were supplied by the ESRC Data Archive. Neither the original collectors of the data nor the Archive bear any responsibility for the analysis or interpretations presented here.

1. Introduction

The increase in interest in measures of subjective well-being over recent years in the social sciences has been remarkable. This interest has addressed a variety of different questions.

Perhaps most self-evidently, these measures have been used to describe who is doing well in their life (both at the individual level and, by a process of aggregation, at the city, region or country level as well). They have also been used to understand individual motivations for behaviour, under the working assumption that individuals behave as if to maximise their well-being: Why do people do what they do?

Last, they have been used to provide novel information that helps us to understand a number of economic magnitudes and puzzles, such as:

- Why aren't we all self-employed, if self-employment leads to higher levels of well-being than employment? (Blanchflower and Oswald, 1998).
- Why do wages differ so much across industries and occupations? (Clark, 2003*b*, and Pischke, 2010).
- How much inequality is acceptable in a society? (Clark and D'Ambrosio, 2014).
- What is the right treade-off in the misery index between unemployment and inflation? (Di Tella *et al*., 2001).
- How can we value public goods, such as pollution and aircraft noise? (Luechinger, 2009, and Van Praag and Baarsma, 2005).

All of the above has produced a fascinating and very fast-growing literature across most of the social sciences. Measures of subjective well-being have a number of advantages. For one, we do not have to try to make up lists of the elements of a good life (How do we know if we have covered everything?). And if we do, how do we weight the different elements: how much is education worth in terms of marital status? Are the weights the same for everyone? Asking individuals simple questions about their well-being arguably avoids all of these problems. Individuals will by definition include everything they find to be important when making their judgements, and will apply their own personal weights to the different domains of their life.

So it seems that we have arrived at a panacea. However, while many now agree that "Well-Being" is a useful or even central topic to analyse, one basic practical question remains: Which measure should be used? The reappearance of proxy measures of utility has

brought with it an embarrassment of riches: there are by now many dozens if not hundreds of potential measures of what makes a good life at the individual level.[2]

There are broadly-speaking three different types of subjective well-being measure.

The first is cognitive/evaluative, and asks the individual to make some statement about overall how well their life as a whole is going. Life satisfaction is one obvious candidate here.

The second are much more along the lines of photos of how I am feeling right this instant. This is why is called "affect" in the psychology literature. It is not uncommon to see arguments that measure of happiness are more akin to being affect than cognitive evaluations.

Last, there are non-hedonic measures of meaning, purpose and accomplishment, called eudaimonic measures.[3] This can be thought of as being consistent with Maslow's hierarchy of needs, as shown in Figure 1 (Maslow, 1943). Here the importance of belonging, self-esteem and self-actualisation is emphasised towards the top of this hierarchy, leading to the development of specific sets of survey questions designed to pick up these eudaimonic domains of individuals' lives.

Some version of all three of these appear in the four ONS questions; more detailed versions can be found in Wave 3 of the European Social Survey (http://www.europeansocialsurvey.org/).

The broad question addressed here is whether happiness, by definition, covers everything that is important to the individual, or whether we would need to add something else in addition to happiness to have a fuller idea of how well the individual is doing. One point of view is that happiness or life satisfaction scores included everything that is important: "*Economic things matter only in so far as they make people happier*" (Oswald, 1997, page 1815). Other authors question this assumption. Fleurbaey and Blanchet (2013) ask three questions regarding the "happiness" literature: "*First, what is happiness at the individual level? Second, what is it at the societal level? Third, why should it be the goal rather than something else, such as wisdom or control over one's life?*" (p.164).

The issue can be represented simply as an opposition between two specifications for well-being. Let W represent the individual's real well-being, LS their reported life satisfaction score, and $\underline{Z}$ any purported other measures of well-being, eudaimonia say. The aim is to distinguish between the following two equations.

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[2] A frightening variety are on show at http://www.deakin.edu.au/research/acqol/instruments/instrument.php.

[3] "*Eudaimonia refers to the idea of flourishing or developing human potential, as opposed to pleasure, and is designed to capture elements such as mastery, relations with others, self-acceptance and purpose*" (Clark *et al.*, 2008).

$$W = W(LS(.), \underline{Z}) \quad (1)$$

$$W = W(LS(\underline{Z}, .)) \quad (2)$$

In other words, do we need to add the $\underline{Z}$ vector to happiness in order to determine individual well-being, or is the information contained in the $\underline{Z}$ vector already reflected in the individual's life-satisfaction score, so that satisfaction is a sufficient statistic for overall well-being?

This would be a simple problem were we to observe *W*. But we don't. It is possible to address the question of which of equations (1) and (2) represents reality by seemingly endless rounds of moral suasion and introspection. It is unclear how much traction this approach has. In the current chapter I am instead going to try to let the data talk.

The following chapter sections will try to establish empirically ask how different the various subjective well-being measures are from each other. Section 2 will start in the simplest possible way by considering the correlation between them. Are individuals who are satisfied with their lives also happy, and do they report higher eudaimonia scores?

Section 3 then considers the correlates of the different measures of well-being. This is particularly important in the context of public policy. Policy can only affect well-being via these explanatory variables (income, labour-force status, housing, or whatever). If these variables have the same effect on all well-being measures, then one measure is arguably as good as another, in terms of what we can achieve via policy.

Section 4 is the most "economic", as it appeals to revealed preference theory.[4] We can infer what matters to individuals by observing their behaviour. Our assumption here is that individuals will act to leave situations with lower levels of well-being in order to go towards situations with higher well-being. As a simple example, individuals quit less satisfying jobs in order to take up positions with higher levels of job satisfaction (Clark, 2001, and Freeman, 1978).

The last substantive Section, number 5, introduces the thorny notion of time. What is important for the measurement of well-being: your cognitive evaluation now of your life, or rather the average level of momentary feelings that you enjoyed over each moment of your life? It might be imagined that these two will give the same answer, but empirically they do

[4] Although Maslow (1943) refers to the hierarchies as being behind theories of human motivation.

not always match. The well-being that you report now is not the average of the experiences that you have lived through.

2. The simple correlation between well-being measures

How do we know whether two variables move in the same direction? We calculate the correlation coefficient between them. In empirical analysis we almost always do this in a regression context, where we see if the dependent variable (say life satisfaction) is correlated with some independent variable (say age or labour-force status). We will here adopt the same strategy, but this time looking at the correlation between series of two subjective well-being measures.

Evidence from the ESS

The first dataset we consider is the ESS. This is a multi-country survey which covered 30 different countries at various points over its first three rounds. Wave 3 of the ESS, collected in 2006/2007, covers 25 different countries and contains a special 50-question module on a variety of different aspects of individual well-being (see Huppert et al., 2009, and Clark and Senik, 2010, for example). We here drop four countries, in which the income variables were not readily usable because they were measured and coded differently, and restrict the sample to those of working age (16-65). This leaves us with an analysis sample size of just over 32 000 individuals.

The first two well-being measures that we consider are both hedonic. The first is a happiness question: respondents are asked "*Taking all things together, how happy would you say you are?*", with answers on a 0 to 10 scale, where 0 corresponds to "*Extremely Unhappy*" and 10 to "*Extremely Happy*". None of the other responses are labelled. Analogously, life satisfaction, which is *a priori* a more cognitive notion of well-being, is measured via the answer to the question "*All things considered, how satisfied are you with your life as a whole nowadays?*", with answers on a 0 to 10 scale, where 0 means extremely dissatisfied and 10 means extremely satisfied.[5]

[5] The distribution of these two hedonic variables is very standard (as shown in Table 1 of Clark and Senik, 2011). Both variables are right-skewed. Mean happiness and life satisfaction scores are both 7, and median scores are 8 and 7 respectively.

Where Wave 3 of the ESS is unusual is in its inclusion of a number of questions that can be thought of as arguably non-hedonic aspects of the good life. These are grouped together under the label of eudaimonia to reflect this notion of functioning, where eudaimonia refers to the idea of flourishing or developing human potential (see the arguments in Deci and Ryan, 2008, and Diener and Seligman, 2004). In practical terms, the eudaimonic well-being to which we refer is measured by survey questions on autonomy, determination, interest and engagement, aspirations and motivation, and a sense of meaning, direction or purpose in life. The argument with which we wish to engage here is that eudaimonia may well be picking up something that is different from standard measures of happiness or life satisfaction.

One difficulty in taking this debate forwards empirically has been identifying datasets that include both hedonic and eudaimonic measures of well-being. Wave 3 of the ESS does contains both types of well-being measures, addressed to the same individuals. In addition, the survey covers over 20 different countries. This helps to address the worry that what works in one country will not work in another (as the understanding of what is meant by the various questions likely differs across countries).

We will consider a number of different measures of eudaimonic well-being here. The first is that of flourishing, as described in Huppert and So (2009). This was originally based on the answers to seven different well-being questions, the first of which was a happiness question. As we here want to rather potentially oppose hedonic and eudaimonic measures of well-being, we do not want the same question to appear in both, as this will mechanically lead to correlation. As such, we drop the happiness aspect of flourishing. Our modified version of Huppert and So's index is defined by the answers to the six different questions below.

Engagement, interest	I love learning new things.
Meaning, purpose	I generally feel that what I do in my life is valuable and worthwhile.
Self-esteem	In general, I feel very positive about myself.
Optimism	I'm always optimistic about my future.
Resilience	When things go wrong in my life it generally takes me a long time to get back to normal. (reverse coding)
Positive relationships	There are people in my life who really care about me.

The first two of these are considered by Huppert and So to be "core features", in that they are necessary for flourishing. The measure they propose of flourishing is thus agreement

with the first two questions, plus agreement with at least three of the next four questions. By this definition, fifty six percent of the ESS sample is flourishing.

The second measure we appeal to is that developed by the New Economics Foundation (2008). Appendix 3 of this document includes details of the construction of a variety of well-being scores. Amongst these, three are of particular interest in the context of eudaimonic well-being: Vitality; Resilience and Self-Esteem; and Positive Functioning, Supportive Relationships, Trust and Belonging. Each of these three is constructed as the unweighted sum of the answers to a number of z-score transformed questions (such that each of the questions has a mean of zero and a variance of one).

The first index, vitality, comes from the answers to questions on how much of the time during the past week the individual felt tired, felt that everything they did was an effort, could not get going, had restless sleep, had a lot of energy, and felt rested when they woke up in the morning, plus the respondent's general health and whether their life involves a lot of physical activity. All of these are recoded so that higher values reflect greater vitality.

Similarly, resilience and self-esteem is given the sum of the answers to the four following z-score transformed questions: "*In general I feel very positive about myself*", "*At times I feel as if I am a failure*", "*I'm always optimistic about my future*", and "*When things go wrong in my life, it generally takes me a long time to get back to normal*". Again, all of these are recoded so that higher numbers reflect greater resilience.

Last, positive functioning is determined by the answers to the following questions: "*In my daily life I get very little chance to show how capable I am*", "*Most days I feel a sense of accomplishment from what I do*", "*In my daily life, I seldom have time to do the things I really enjoy*", "*I feel I am free to decide how to live my life*", "*How much of the time during the past week have you felt bored?*", "*How much of the time during the past week have you been absorbed in what you were doing*", "*To what extent do you get a chance to learn new things?*", "*To what extent do you feel that you get the recognition you deserve for what you do?*", and "*I generally feel that what I do in my life is valuable and worthwhile*".[6]

The two hedonic measures, self-declared Happiness and Life Satisfaction, described above are both answered on 0 to 10 ordinal scales. The flourishing measure from Huppert and So is a binary variable, while the three New Economics Foundation measures are summed z-scores. Even so, we can calculate simple bivariate correlation coefficients between these six variables. These are what Table 1 shows. All of the correlation coefficients are significant at

[6] The Cronbach's alpha scores for the sets of questions that are used to make up vitality, resilience and positive functioning are 0.70, 0.61 and 0.65 respectively.

better than the 0.01% level. In terms of size, happiness and life satisfaction are correlated at 0.7.[7] The correlation coefficients between the hedonic and eudaimonic measures (given by the bottom four lines in the first two rows of Table 1) are between 0.3 and 0.4. Last, the correlations between the eudaimonic measures themselves range between 0.33 (flourishing and vitality) and 0.56 (flourishing and resilience).

These well-being measures therefore certainly do co-move, although they are far from being perfectly correlated.

Evidence from the BHPS

We now consider the same type of correlations in one of the best-known and widely-used panel datasets: the British Household Panel Survey (BHPS: https://www.iser.essex.ac.uk/bhps/). This is a general panel survey initially covering a random sample of approximately 10 000 individuals in 5 500 British households, with this figures later rising to around 15 000 individuals in 9 000 households. The BHPS includes a wide range of information about individual and household demographics, employment, income and health.

The two main subjective well-being measures in the BHPS are the General Health Questionnaire (GHQ), which appears in all waves of the BHPS, and overall life satisfaction, which appears in Waves 6-10, and then 12-18. The GHQ-12 (see Goldberg, 1972) reflects overall mental well-being. It is constructed from the responses to twelve questions (administered via a self completion questionnaire) covering feelings of strain, depression, inability to cope, anxiety based insomnia, and lack of confidence, amongst others (see Appendix A). Responses are made on a four point scale of frequency of a feeling in relation to a person's usual state: "*Not at all*", "*No more than usual*", "*Rather more than usual*", and "*Much more than usual*". The GHQ is widely used in medical, psychological and sociological research, and is considered to be a robust indicator of the individual's psychological state. The between-item validity of the GHQ-12 is high in this sample of the BHPS, with a Cronbach's alpha score of 0.90.

We here use the Caseness GHQ score, which counts the number of questions for which the response is in one of the two "low well-being" categories. This count is then reversed so

[7] The correlation between happiness and life satisfaction in Eurobarometer data from 1975 to 1986 is somewhat lower at 0.56 (Di Tella *et al.*, 2003). This is perhaps due to both life satisfaction and happiness being measured on shorter (but different) scales: 1-4 and 1-3 respectively in this dataset. The same correlation in Wave 3 (1995) of the World Values Survey data is 0.81 (see Inglehart and Klingemann, 2000).

that higher scores indicate higher levels of well being, running from 0 (all twelve responses indicating poor psychological health) to 12 (no responses indicating poor psychological health).

The second measure is satisfaction with life, which is similar to that asked in the ESS above. Respondents are asked "*How dissatisfied or satisfied are you with your life overall*", with responses measured on a scale of one (not satisfied at all) to seven (completely satisfied).

Last, the BHPS has also asked a number of questions that appear more eudaimonic in nature. Waves 11 and 16 of the BHPS (2001 and 2006) include the CASP-19 (Hyde *et al*., 2003). This is a set of well-being questions originally designed for older adults. In particular, amongst these 19, we find questions regarding energy (I feel full of energy these days), looking forward to each day (verbatim), the measure of control (I can do the things that I want to do), autonomy (I feel that I can please myself what I do), feeling that my life has meaning (verbatim), and doing new things (I choose to do things that I have never done before). In terms of the NEF categorisation above, the first of these questions relate to vitality, the second to resilience, and the others to positive functioning.

All of the CASP-19 questions are answered on a four-point scale from 1 to 4, corresponding to "Often", "Sometimes", "Not often" and "Never". So that more positive numbers refer to higher well-being, the six questions above are all reverse coded. As the eudaimonic questions only appear in Waves 11 and 16, in the first of which the standard life satisfaction question did not appear, we here retain Wave 16 only.

The bivariate correlations between the different well-being measures in this wave of the BHPS appear in Table 2. As in Table 1, all of these correlation coefficients are significant at better than the 0.01% level. Life satisfaction and the Caseness measure of the GHQ are correlated at 0.52, which is still quite a large correlation, although less than the correlation coefficient of 0.7 between life satisfaction and happiness in the ESS data in Table 1. In terms of the relationship between the hedonic and eudaimonic measures, GHQ is correlated with the three measures of the latter at about 0.4, while the analogous figures for life satisfaction are slightly higher at about 0.45. The correlations between the eudaimonic measures themselves range between 0.4 and 0.5. At the broad level, the correlations in Table 2 are actually quite similar in nature to those in the ESS data in Table 1. The only major difference refers to the correlation between the two hedonic measures. Happiness and life satisfaction are correlated at 0.7 in the ESS, whereas life satisfaction and GHQ are correlated at 0.52 in the GHQ. This is perhaps to be expected, given the nature of the GHQ scale, which is more designed to

evaluate the level of psychological functioning, as the specific questions in Appendix A suggest.

Evidence from the ONS

As part of the National Well-Being Programme (see http://www.ons.gov.uk/ons/guide-method/user-guidance/well-being/index.html), the UK Office for National Statistics decided in 2011 to add the following subjective well-being questions to its annual Integrated Household Survey. The four questions are:

- Overall, how satisfied are you with your life nowadays?
- Overall, how happy did you feel yesterday?
- Overall, how anxious did you feel yesterday?
- Overall, to what extent do you feel the things you do in your life are worthwhile?

In terms of the distinctions that we have made so far, the first of these is an evaluative hedonic question, as we have already seen in the ESS and the BHPS. The second and third are measuring positive and negative affect, while the last is eudaimonic.

Table 3 shows the correlations between these four measures (these come directly from Office for National Statistics, 2011). Here the correlation between life satisfaction and positive affect (happiness yesterday) is 0.55, while that with negative affect (anxiety yesterday) is smaller in absolute size at -0.26. With respect to the eudaimonia question (life being worthwhile), the correlation with life satisfaction is high at 0.66, that with positive affect is somewhat lower at 0.51, and that with negative affect is the smallest at -0.22. Again, the correlations between the hedonic measures are quite large, as are those between the hedonic and eudaimonic measures. The exception here is anxiety yesterday, which exhibits a looser relationship with the other subjective well-being measures.

This simple correlation analysis is instructive, but does not inform us about well-being policy. Which variables can policy realistically affect which might impact on subjective well-being? And are these impacts similar across the different measures? If they are then any policy that affected life satisfaction will also affect eudaimonia (say), so that in a policy sense

it does not matter what measure of well-being we use. This is what we analyse in the next section.

3. The correlates of well-being

To see whether policy may affect different measures of well-being in the same way, we here turn to multivariate regression analysis, and calculate Pearson correlation coefficients between the vectors of estimated coefficients.[8]

Evidence from the ESS

We first consider regression results from Wave 3 of the ESS using "standard" socio-demographic variables as controls. These are similar to those that are reported in Clark and Senik (2011), except that here we are going to estimate every equation using linear estimation. The set of right-hand side variables in these regressions is male, age and age-squared, three education dummies, four marital status dummies, log income, nine labour-force status dummies, and 20 country dummies.[9] Taking out omitted categories in the sets of dummies, each regression has 17 estimated coefficients on socio-demographic variables, and 19 estimated country dummy coefficients.

The next step then is to see how similar these estimated coefficients are between the different subjective well-being measures. This is what Table 4 shows. There are two levels at which this comparison can be effected: first, using all 36 of the estimated coefficients, including the 19 estimated country fixed effects; and only considering the 17 individual-level socio-demographic (age, sex, education etc.) variables. These correspond to the top and bottom panels of Table 4.

The first striking conclusion from the top panel of Table 4 is that the pattern of the determinants of happiness and life satisfaction in the ESS are almost identical: the set of 36

[8] This remains a relatively unusual approach in the subjective well-being literature. Clark and Senik appealed to this method for various well-being scores in the ESS. An earlier contribution is Peasgood (2007), who considers fifteen different subjective well-being measures that appear across waves 9, 11 and 14 of the BHPS. She shows that some variables have a very consistent correlation with all well-being measures (log household income and divorce). However, the correlation of others is far more varied in terms of sign (education and male). She does not calculate the correlations between the whole vector of estimated coefficients, as we do here. Blanchflower and Oswald (2004) show that the determinants of life satisfaction and happiness are very similar in Eurobarometer data from Great Britain (see their Appendix B). Last, the variables that are correlated with happiness, life satisfaction, self-esteem, mastery and depression are shown to be quite similar in Wave 2 of the Americans' Changing Lives survey (see Thoits and Hewitt, 2001).

[9] Education is missing in Cyprus, so there only 20 countries in the regression, as opposed to 21 in the descriptive analysis of subjective well-being in Section 2.

estimated coefficients are correlated at 0.95 between the two measures. That this correlation was lower at 0.7 in the raw data in Table 1 suggests that the differences in the distribution of happiness and life satisfaction are due to variables that do not measure here, or could even simply be due to measurement error. In terms of increasing subjective well-being, any policy that affects happiness will affect life satisfaction in almost exactly the same way.

Perhaps more to the point, this correlation coefficient suggest that the trade-offs in the life satisfaction and happiness regressions are extremely similar. For example, the estimated regression coefficients suggest that being unemployed has about the same effect on life satisfaction as about 2.2 log income points; this figure is 1.7 in the happiness equation. Along the same lines, disability is equivalent to a loss of 2.4 log income points in the life satisfaction regression; in the happiness regression this figure is 2.5.

This similarity in the determinants of happiness and life satisfaction does not wholly translate into eudaimonia. Here the correlations with life satisfaction are about 0.5, falling to 0.1 in the case of resilience. The analogous figures for happiness are about 0.6, and 0.14 for the correlation with the determinants of resilience.

Perhaps the most interesting feature of Table 4 is what happens when we look at the correlation only for the estimated coefficients on the individual-level variables. Now the correlation between the determinants of eudaimonia and life satisfaction jumps up to 0.7 to 0.8, and that with happiness to 0.8 to 0.9. What this means in words is that the low correlations in some cells of the top panel of Table 4 were entirely due to country-level differences in the hedonic and eudaimonic measures of well-being. The same is actually true for the correlation between the determinants of the different measures of eudaimonic well-being in the ESS. As policy cannot consist in making the Germans French, any policy that affects the individual-level variables that we have included in these regressions (education, marital status, income etc.) will have broadly the same effect on all of the measures of well-being that we have analysed above. To that extent, it arguably does not matter which measure we retain.

Evidence from the BHPS

We retain the same five measures of well-being as in Table 2 above. As for the ESS data above, we will regress these in turn on a standard list of individual-level variables (there is of course no need for country dummies here, as the BHPS is a single-country survey). This is the same list as used above for the ESS. It here comprises 18 variables (as there are ten labour-force status variables in the BHPS, as opposed to nine in the ESS).

In Table 5, the correlation between the estimated coefficients in the GHQ and life satisfaction equation is 0.81.[10] That between the eudaimonic variables, on the one hand, and GHQ or life satisfaction on the other varies between 0.66 and 0.92. Last, the correlation of the determinants of the different eudaimonia variables between themselves ranges between 0.65 and 0.90. These are all fairly high correlation coefficients. It is instructive to compare them with their bivariate counterparts in Table 2. They are all far higher: as was the case in the ESS data discussed above, there is far lower correlation in the unobservable determinants of subjective well-being than there is in the observable determinants.

Evidence from the ONS

We last consider well-being regressions in the ONS data. These are taken directly from Office of National Statistics (2011), Table XX. In a way these regressions are the polar opposite of those which were run above on ESS and BHPS data. These latter were pretty stripped-down, with under 20 right-hand side variables. Those reported in the ONS publication include 106 right-hand side variables.

It is not clear that there is any mechanical relationship between the number of regressors and the way in which their estimated coefficients correlate across different dependent variables. As it turns out, the paucity or plenitude of variables on the right-hand side does not seem to materially affect our qualitative conclusions regarding the size of any correlation. The correlation coefficients reported in Table 6 for the four subjective well-being measures in the ONS data are all around 0.8 in absolute terms or higher.

It is perhaps worthwhile emphasising the figure in the bottom left corner of Table 6: the correlation coefficient of 0.96 between the correlates of life satisfaction and the correlates of feeling that the things you do in your life are worthwhile are pretty much identical. Whatever we change on the right-hand side of this equation to try to improve the life satisfaction of Britons will have the same impact on the their feeling that their lives are worthwhile.

However, in a sense the analysis carried out in this and the previous Section is of only partial use. Knowing that life satisfaction and some other putative well-being measure are correlated at 0.6, say, is an interesting fact to know: it certainly shows that they are not reflecting exactly the same construct. But it does not answer the question of which of the two is actually the "right" measure. This is why we now turn in the next section to the prediction

[10] Along somewhat the same lines, the time profiles of movements in subjective well-being with after the onset of a life event (marriage, divorce, widowhood, birth of a child and unemployment) were remarkably similar for GHQ and life satisfaction: see Clark and Georgellis (2013).

of actual behaviour, where this behaviour is argued to be driven by what really matters to the individual in terms of their well-being.

4. Behavioural beauty contests: Which measure predicts best?

Showing that subjective variables predict future observable outcomes has become something of a cottage industry associated with the interpersonal validation of subjective well-being reports. After all, if these numbers are just noise, then we can't expect them to predict individuals' future behaviour. And even if they are not noise, but we cannot compare my six to your five because we use the scale differently, then we again cannot predict what I will do in the future relative to what you will do, as we do not know whether I was happier or less happy than you to start with. This is known as the problem of the interpersonal comparability of well-being scores. Finding that people who say that they are less happy now are more likely to undertake some action in the future (typically associated with leaving that unhappy state) has provided strong evidence that there is information in what people say.

Some of the earlier contributions in this area used panel data (with repeated observations on the same individual over time) to show that individuals who said that they were less satisfied with their jobs when interviewed were more likely to have quit that job when re-interviewed in the future. Again, were we simply not able to compare my six to your five then we could not have predicted this behaviour. Perhaps the first is Freeman (1978), who uses panel data from three surveys (NLS Older Men; the Michigan PSID; and NLS Younger Men) to show that current job satisfaction scores are typically at least as strong a predictor of future quits as are current wages (see also Akerlof *et al*., 1988, for further evidence data from the NLS Older Men survey, and Clark *et al*., 1998, for results in the first ten years of the German Socio-Economic Panel (SOEP)). All of these papers analyse job quitting in a multivariate regression framework, which means in words that we are asking whether subjective evaluations add information over and above the typically measured objective characteristics of the worker and her job (age, sex, education, industry, occupation, wages, hours of work, and so on).

Research in this respect on the labour market has not only been restricted to seeing how long employees stay in their jobs. Analogously, Georgellis *et al.* (2007) use self-reported job satisfaction scores of the self-employed in Waves 1 to 8 (1991–1998) of the BHP to predict how much longer they will remain in self-employment: the least satisfied are the fastest to

leave. Clark (2003*a*) also uses BHPS data to show that the size of the drop in GHQ upon entering unemployment predicts how much the individual searches for a new job, and how fast they leave unemployment: those who suffered the largest well-being drop search more and leave the fastest. This result has been replicated using data on life satisfaction in SOEP data by Clark *et al*. (2010).

There has also been work on predicting future marital separation using current reported subjective well-being scores. Here there are two people involved in a couple, so that we have two well-being scores. Guven *et al*. (2012) appeal to long-run panel data from three separate countries (BHPS, SOEP and Australian HILDA data) to show that happier marriages (measured by the average life satisfaction score of the husband and wife) will last longer in the future.[11]

Most of this validation work has only used one single well-being measure to predict future behaviour. It is fairly rare to compare the predictive power of different measures in order to establish which one "matters" the most, and therefore which is more closely correlated with the individual's true level of well-being.

One example of such a well-being beauty contest is Clark (2001), where different measures of satisfaction with job domains are used to predict future quits in the first seven waves of BHPS data: that which predicts the best (which turns out here to be satisfaction with job security) is argued to be the most important aspect of the job for the individual.[12] Another is Green (2010), who uses multiple well-being measures to see which of them predicts future behaviour the best. The context is again the labour market, with panel data from the UK Skills Survey being used to predict future quitting from the job. The well-being measures in the dataset include an overall measure of job satisfaction, and multiple-iitem Warr scales reflecting job-related well-being along the Depression–Enthusiasm and the Anxiety–Comfort axes. It is first shown (in his Table 2) that both depression-enthusiasm and anxiety-comfort independently predict future quitting. However, when we add job satisfaction to the model, it attracts a strongly negative estimated coefficient (individuals who report higher job satisfaction scores are less likely to quit in the future), while both depression-enthusiasm and anxiety-comfort play no further role in predicting future quits.

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[11] Guven *et al*. (2012) also show that it is not only average life satisfaction that matters, but also its distribution. In particular, at a given total sum of husband's and wife's life satisfaction, couples where the husband is more satisfied than the wife are more likely to split up than couples where the wife is more satisfied than the husband.

[12] The greatest predictive power is revealed by comparing a statistical measure of the fit of the different models. When using a probit or a hazard model to predict future quits, the best fit corresponds to the least negative log-likelihood (this is the regression with the greatest explanatory power).

Turning away from the labour market to health, well-being measures can be used to predict longevity. A well-known piece of work by Danner *et al*. (2001) analysed the short life sketches written by 180 nuns in Milwaukee when they joined the order in the 1930s, at around age 22. These sketches were scored for emotional content and related to survival during ages 75 to 95. The results show a strong link between positive emotion in early life and longevity six decades later.

This kind of analysis can be put on a more formal footing, with in addition a comparison of different well-being measures, using data from the English Longitudinal Study of Aging (ELSA: http://www.ifs.org.uk/ELSA), which covers individuals aged 50 or over. The first wave of ELSA took place in 2002/03, and individuals are re-interviewed every two years. Each wave of ELSA data included a number of well-being measures. In Steptoe *et al*. (2012) these are related first to illness and then to mortality, both measured in March 2012. In particular, two subjective well-being measures are compared: affective well-being, as given by answers to a question about enjoyment of life (this question is part of the CASP-19); and life satisfaction. The former was asked in the first wave of ELSA, but the second did not appear until the second 2004/05 wave.

The analysis of mortality relates enjoyment in 2002/03 to mortality in March 2012; this covers 9025 individuals, of whom 1785 died. Enjoyment with life in 2002/03 is split into tertiles. Controlling only for age and sex, hazard rate analysis (where the hazard here is dying) shows that those in the highest enjoyment tertile in the first wave had a 57% lower probability of dying by March 2012 than those in the lowest tertile. Including successive blocks of covariates reduces this differential. But even the full model, which conditions on depression, health, negative affect, smoking and drinking, amongst other variables, only drives this figure down to 30%.

The parallel analysis using life satisfaction as the explanatory variable (which does not appear until Wave 2 of ELSA, making for a shorter analysis period) reveals similar findings. However, the effect size is much smaller. Controlling for only age and sex, those in the highest satisfaction tertile in the second wave had a 31% lower probability of dying by March 2012 than those in the lowest tertile. Including successive blocks of covariates reduces this differential, and in the full model (as for enjoyment above) the differential is only 9% and, more to the point, insignificant.

It would be of great interest to carry out this kind of analysis systematically for all of the well-being variables available in earlier waves of ELSA. As it stands, the results in Steptoe *et*

al. (2012) do seem to suggest that (one aspect of) positive affect is far more salient in predicting mortality outcomes than is a general evaluative measure of life satisfaction.

It is also possible to carry out these kinds of beauty contests among subjective well-being measures using the BHPS. Here we can carry out a simple test, seeing which of life satisfaction or GHQ measured at year *t* is best able to predict some future observable event. Here I will concentrate on future marital break-up, and consider the possibility that those who were married at year *t* were separated or divorced when they were re-interviewed one year later (at year *t+1*). Both of these well-being variables do indeed predict future marital break-up: individuals decide to leave situations that are associated with lower well-being. However, when we introduce both of them together, it turns out that life satisfaction is a stronger predictor of break-up than is the GHQ (the coefficient on z-score transformed GHQ is about three times that on life satisfaction). If we therefore had to choose between life satisfaction and GHQ in terms of "what matters to individuals", this would suggest that we should choose the former.

We can also look at Waves 11 and 16 of the BHPS, which included the nineteen questions making up the CASP-19 (see Appendix B). These can be used sequentially to see which predicted the most strongly divorce or separation by Wave 12 or 17. The sample here is smaller, as it consists of only individuals who were married in Wave 11 or 16 of the BHPS (and who provided CASP-19 information at Wave 11 and 16, and who were re-interviewed in Wave 12 or 17). Even so, some potentially useful information results from this exercise. These regressions control for labour-force status, sex, education, number of children, age and age-squared, the log of household income, self-assessed health, and region and wave dummies. They are estimated on the sample of individuals aged between 16 and 60.

We find that ten out of the 19 questions individually significantly predict future marital break-up in this smaller sample. The two strongest correlations are with the questions on satisfaction with the way life has turned out, and looking back on life with happiness. These two are most definitely hedonic questions. The next two are feeling left out of things, and looking forward to each day. The other six questions with significant coefficients attract far smaller estimates.[13]

[13] These are shortage of money stops me from doing the things I want to do, family responsibilities are inhibiting, enjoying the activities that the respondent participates in, not being in control of life, life has meaning, and the future looks good. The coefficients on all of these six are about one-third the size of the largest estimated coefficient (that on being satisfied with way life has turned out).

Finally, some recent work has used hypothetical and actual choices to evaluate whether individuals make decisions based only on happiness or rather on happiness and something else as well.

Benjamin *et al*. (2012) consider a sequence of hypothetical pairwise-choice scenarios. In the example they highlight (page 2087), individuals are asked to decide between two new jobs. The jobs are identical except with respect to work hours and pay, as follows.

Option 1: A job paying $80,000 per year. The hours for this job are reasonable, and you would be able to get about 7.5 hours of sleep on the average work night.

Option 2: A job paying $140,000 per year. However, this job requires you to go to work at unusual hours, and you would only be able to sleep around 6 hours on the average work night.

Individuals are first asked "*Between these two options, taking all things together, which do you think would give you a happier life as a whole?*" They were then asked "*If you were limited to these two options, which do you think you would choose?*" It is shown that individuals do not always choose the option in the second question that they said would make them happier in the first question (see their Table 2), although the percentage not doing so is only around ten per cent.

Following on this analysis of a general sample, a sample of students are asked the hypothetical choice and overall happiness questions, as well as the effect of the choice on eleven non-SWB aspects of life:

- Family happiness
- Health
- Life's level of romance
- Social life
- Control over your life
- Life's level of spirituality
- Life's level of fun
- Social status
- Life's non-boringness
- Physical comfort
- Sense of purpose

They then run a series of choice regressions using the answers to the above questions. As shown by the R^2-statistic in the first column of their Table 3, 0.38 of the variation in choice is explained by SWB (own happiness) alone. When choice is then regressed on both own happiness and the eleven non-SWB aspects of life, the R^2-statistic does rise, but arguably not very much (to 0.41). One conclusion is then that non-happiness aspects of life matter for choice, but not very much.

Benjamin *et al*. (2012) do add a rider to this conclusion though, suggesting that for more likely decisions that their student sample take, the role of the non-happiness questions was larger: "*the four scenarios we designed to be representative of typical important decisions facing our college-age Cornell sample…socialize versus sleep, family versus money, education versus social life, and interest versus career… are among the scenarios with the lowest univariate R^2 and, correspondingly, the highest incremental R^2*" (page 2104). Consequently, non-happiness variables may matter much more in certain real-life situations.

A follow-up paper Benjamin *et al*. (2014) takes something of the same tack, but this time looks at actual critical decisions that are taken by young medical students – their choice of residency, as submitted for clearing – to survey evidence on their expectations regarding various outcomes in life domains in their top four residency choices. The key result here is that, as in their previous work, subjective well-being variables often do a good job of ranking actual choices, but do not necessarily get the marginal rates of substitution right. The authors conclude that we should then be wary of using the results from the empirical analysis of happiness or life satisfaction questions to inform us about the trade-offs that matter in individuals' lives.

There is thus starting to be a useful accretion of work which takes a variety of well-being measures, and rather than relate them between themselves, relates them to some observable individual choice. While this work is for the most part very new, it does seem to be a promising way of confronting the current variety of measures available.

5. Life as you live it or life as you remember it?

The last question that this chapter will address concerns the temporality of measurement. We might imagine that at some fundamental level, this should not matter. Were happiness to be measured every hour, then happiness in a given day should be the average of the hourly scores. Were it to be measured every day, then the yearly figure would be the average of the

daily scores. And life satisfaction should be some average of that over the different years. The events that drive daily or hourly measures of well-being should then appear in the same way (on average) in measures covering a longer time period.

We have a number of research findings that suggest that this is actually not the case. A first well-known piece is Redelmeier and Kahneman (1996), who demonstrate (from data on patients undergoing invasive procedures) that the overall evaluation of the pain of the procedure was not a simple sum of the pain that the patients recorded minute-to-minute while the intervention was taking place. This finding underlined a number of key points. The first was duration neglect, in that longer periods of pain were not necessarily considered to be worse than shorter periods of pain. The second was that some periods were weighted more heavily than others in the overall evaluation (indeed, some periods seem to be discounted altogether). Redelmeier and Kahneman proposed a model of peak-end evaluation to describe their data: individuals' overall evaluations of the medical procedure were given by the average of the most intense period (the peak of pain) and the last period (the end).

This seems to be a critical point. The well-being that we experience moment to moment cannot be just summed up to provide our overall evaluation of the experience. In this context, Kahneman *et al.* (1997) distinguish between experienced utility (what we feel from moment to moment) and remembered utility, which is the cognitive/evaluative appraisal of the entire experience. It is the latter that will drive behaviour: our decisions about what to do will be driven by our memories of similar experiences in the past.

In this light, we may not expect measures of subjective well-being which refer to a particular day to pick up the same phenomena as those in which individuals are asked to evaluate their life as a whole. Kahneman and Deaton (2010) use data on 450 000 Americans in the Gallup-Healthways Well-Being Index. This latter includes measures that describe feelings in one particular day, and an overall evaluation of life. The former refers to the emotions experienced of yesterday (including enjoyment, happiness, anger, sadness, stress and worry). The overall evaluative question in the Gallup data comes from Cantril's ladder, where individuals are asked to rate their current life on a ladder scale running from 0, "*the worst possible life for you*", to 10, "*the best possible life for you*".

Kahneman and Deaton (2010) show that the variables which are correlated with yesterday's emotions are not necessarily the same as those which are correlated with Cantril's ladder. They concentrate in particular on the relationship with monthly household income. Their Figure 1 reveals a satiation effect of annual household income with respect to the emotional variables, with income losing its protective role against stress and negative affect,

and failing to provide much more positive affect, at an annual level of around 75 000 US dollars (the survey data come from 2008 and 2009); on the contrary, there is little evidence of satiation in the effect of income on the Cantril ladder. As such, after a certain point higher income leads individuals to rate their life overall as better, although it does not affect the levels of daily positive and negative affect they experience.

Research has then suggested that there is not necessarily any stable mapping from experienced to remembered utility. The implications are major. Individuals may well continually make decisions (based on remembered utility) which do not lead to the greatest level of experienced utility. Our transformation of experienced utility is akin to a cognitive bias that may prevent us from having happier lives. The contrast of experienced and remembered utility also raises a major point about what having a good life actually means. Does it mean experiencing more moment to moment happiness, or does it rather mean remembering a happy experience? Does life as you live it take primacy over life as you remember it? It is not easy to think of any way in which data can contribute to this debate.

6. Conclusion

The remarkable rise of subjective well-being across the social sciences has turned the spotlight onto its measurement. I have here asked the question of whether what are sometimes called cognitive/evaluative measures of how well and individual is doing provide sufficient statistics for overall quality of life: Should we measure life satisfaction only, or do we need to add together life satisfaction and something else? And in particular, do we need to add eudaimonic measures of meaning and purpose?

I have not relied on argument or persuasion, but have tried to bring data to the questions. First of all, many measures of subjective well-being are correlated between themselves. These correlations are of course not perfect, as there will always be some noise in their measurement. Second, the individual-level variables that are correlated with well-being are pretty similar across different subjective well-being measures. As shown across three different datasets (the ESS, BHPS and ONS, in Tables 4 through 6 respectively), policy that affected the baseline variables causing well-being (education, marital status, log income and labour-force status) would have pretty much the same effect on all of the various measures of well-being under consideration.

Perhaps the most promising approach to the question is to see which measure of well-being best predicts future behaviour: after all, even though we cannot observe individuals' "real" levels of well-being we can certainly hypothesise that they will act in order to increase it if they can. The evidence here remains quite scanty, and there is very likely more useful research to be done in this domain. While work on ELSA has suggested that enjoyment with life is a better predictor of mortality than life satisfaction (although both are arguably hedonic questions), satisfaction questions are better predictors of marital break-up in the BHPS than both the GHQ and the various eudaimonic variables appearing in the CASP-19.

It is hard to imagine that the issue addressed here will go away in the near future. The contrast of observed outcome and self-reported well-being will remain a fruitful area for research. This could progress via further examination of the correlates of different kinds of well-being, or it could be from (I believe) much-needed work on observed behaviours using panel data. Alternatively, it could appeal to genetic variation (Oswald and Proto, 2013), or even brain activity (a good example is Urry *et al*., 2004). It may well be a long hard ride to reach any form of consensus, but it is difficult to overestimate the importance of such an undertaking.

Appendix A. The GHQ.

The twelve questions used to create the GHQ-12 measure appear in the BHPS questionnaire as follows:

1. Here are some questions regarding the way you have been feeling over the last few weeks. For each question please ring the number next to the answer that best suits the way you have felt.

Have you recently....

a) been able to concentrate on whatever you're doing?

Better than usual 1
Same as usual 2
Less than usual 3
Much less than usual 4

then

b) lost much sleep over worry?
e) felt constantly under strain?
f) felt you couldn't overcome your difficulties?
i) been feeling unhappy or depressed?
j) been losing confidence in yourself?
k) been thinking of yourself as a worthless person?

with the responses:

Not at all 1
No more than usual 2
Rather more than usual 3
Much more than usual 4

then

c) felt that you were playing a useful part in things?
d) felt capable of making decisions about things?
g) been able to enjoy your normal day-to-day activities?
h) been able to face up to problems?
l) been feeling reasonably happy, all things considered?

with the responses:

More so than usual 1
About same as usual 2
Less so than usual 3
Much less than usual 4

Appendix B. The CASP-19

The nineteen questions used to create the CASP-19 measure are as follows. They can be split up into four broad groups. All CASP-19 questions are answered on a four-point scale from 1 to 4, corresponding to "*Often*", "*Sometimes*", "*Not often*" and "*Never*". The questions marked with an asterisk are reverse coded, so that higher numbers refer to more positive evaluations. The BHPS variable name is in parentheses. The coefficient at the end of each group refers to Cronbach's alpha as calculated in Waves 11 and 16 of the BHPS, where these questions appear.

CONTROL

- *(QLFA) My age prevents me from doing the things I would like to do*
- *(QLFB) I feel that what happens to me is out of my control*
- *(QLFC) I feel free to plan for the future**
- *(QLFD) I feel left out of things*

(Alpha = 0.59)

AUTONOMY

- *(QLFE) I can do the things I want to do**
- *(QLFF) Family responsibilities prevent me from doing what I want to do*
- *(QLFG) I feel that I can please myself what I do**
- *(QLFH) My health stops me from doing the things I want to do*
- *(QLFI) Shortage of money stops me from doing the things I want to do*

(Alpha = 0.51)

SELF-REALISATION

- *(QLFJ) I feel full of energy these days**
- *(QLFK) I choose to do things that I have never done before**
- *(QLFL) I feel satisfied with the way my life has turned out**
- *(QLFM) I feel that life is full of opportunities**
- *(QLFN) I feel that the future looks good for me**

(Alpha = 0.80)

PLEASURE

- *(QLFO) I look forward to each day**
- *(QLFP) I feel that my life has meaning**
- *(QLFQ) I enjoy the things that I do**
- *(QLFR) I enjoy being in the company of others**
- *(QLFS) On balance, I look back on my life with a sense of happiness**

(Alpha = 0.82)

Figure 1. Maslow's Hierarchy of Needs

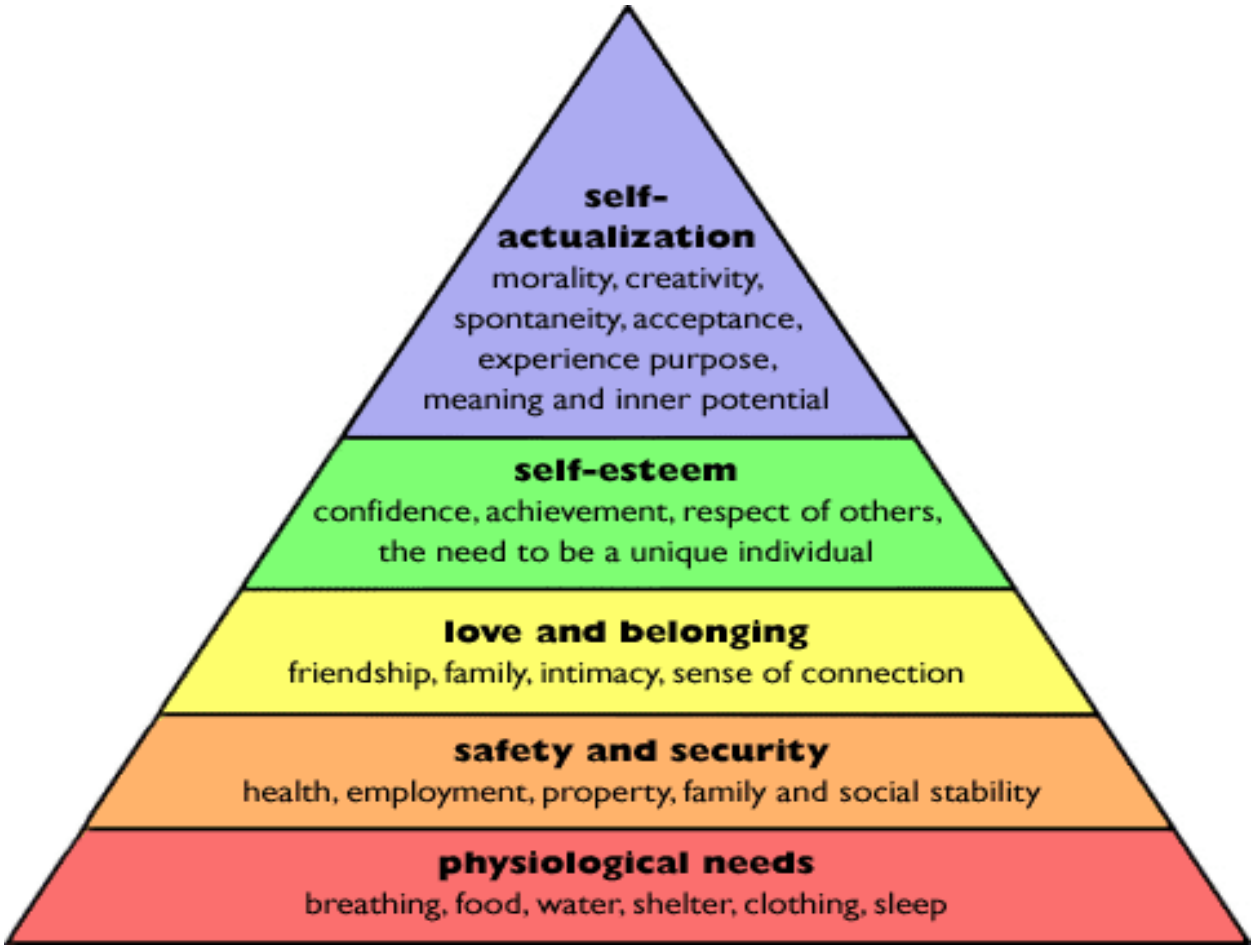

Table 1. The correlation between subjective well-being measures in the ESS, 2006/2007

	Happiness	Life Satisfaction	Flourishing	Vitality	Resilience	Functioning
Happiness	1					
Life Satisfaction	0.706	1				
Flourishing	0.307	0.294	1			
Vitality	0.387	0.380	0.333	1		
Resilience	0.403	0.379	0.560	0.488	1	
Functioning	0.406	0.415	0.371	0.453	0.464	1

Table 2. The correlation between subjective well-being measures in the BHPS, 2006

	GHQ	Life Satisfaction	Vitality	Resilience	Functioning
GHQ	1				
Life Satisfaction	0.519	1			
Vitality	0.437	0.452	1		
Resilience	0.385	0.470	0.415	1	
Functioning	0.384	0.460	0.511	0.506	1

Table 3. The correlation between subjective well-being measures in the ONS, 2011

	Life Satisfaction	Happy	Anxious	Worthwhile
Life Satisfaction	1			
Happy	0.550	1		
Anxious	-0.260	-0.390	1	
Worthwhile	0.660	0.510	-0.220	1

Table source: Office for National Statistics

Table 4. The correlation between the determinants of subjective well-being in the ESS, 2006/2007

All 36 coefficients, including 19 country dummies

	Happiness	Life Satisfaction	Flourishing	Vitality	Resilience	Functioning
Happiness	1					
Life Satisfaction	0.952	1				
Flourishing	0.578	0.533	1			
Vitality	0.548	0.482	0.562	1		
Resilience	0.136	0.098	0.467	0.555	1	
Functioning	0.604	0.498	0.593	0.677	0.496	1

17 individual-level coefficients, excluding country dummies

	Happiness	Life Satisfaction	Flourishing	Vitality	Resilience	Functioning
Happiness	1					
Life Satisfaction	0.949	1				
Flourishing	0.748	0.651	1			
Vitality	0.742	0.689	0.759	1		
Resilience	0.885	0.830	0.809	0.911	1	
Functioning	0.902	0.788	0.903	0.809	0.900	1

Table 5. The correlation between the determinants of subjective well-being in the BHPS, 2006

	GHQ	Life Satisfaction	Vitality	Resilience	Functioning
GHQ	1				
Life Satisfaction	0.812	1			
Vitality	0.919	0.690	1		
Resilience	0.661	0.857	0.652	1	
Functioning	0.844	0.663	0.902	0.668	1

Table 6. The correlation between the determinants of subjective well-being in the ONS, 2011

	Life Satisfaction	Happy	Anxious	Worthwhile
Life Satisfaction	1			
Happy	0.911	1		
Anxious	-0.804	-0.822	1	
Worthwhile	0.964	0.910	-0.790	1

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