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DIMENSIONS OF SUBJECTIVE WELL-BEING

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Abstract

Using the American Life Panel, we conduct an experiment to investigate the relations between various evaluative and experienced well-being measures based on the English Longitudinal Study of Aging, the Gallup Wellbeing Index, and a 12-item Hedonic Well-Being module. We find that all evaluative measures load on the same factor, but the positive and negative experienced affect measures load on different factors. We find evidence of an effect of response scales on both the estimated number of underlying factors and their relations with demographics. We conclude that finer scales allowing more nuanced answers offer more reliability.

Keywords: Subjective Well-Being, Response Scales, Life Satisfaction

Introduction

Recent years have shown a proliferation of studies using various measures of happiness and life satisfaction, making it perhaps one of the most stimulating new developments in the social sciences (Frey & Stutzer, 2005; D. Kahneman, A. B. Krueger, D. Schkade, N. Schwarz, & A. Stone, 2004a). Recent government initiatives in countries such as France, through the Commission on the Measurement of Economic Performance and Social Progress (Stiglitz, Sen, & Fitoussi, 2009), the United Kingdom, through the Office of National Statistics (Dolan, Layard, & Metcalfe, 2011), or the United States, with Federal Reserve Chairman Ben Bernanke declaring his interest in finding better measurements of American's well-being (Rugaber, 2012), have further spurred a debate in the scientific community.

The majority of findings on subjective well-being are based on evidence from global life satisfaction measures used in large scale surveys. Throughout the literature however, these findings have raised methodological concerns, as minor events and moods may greatly influence responses to those questions (Schwarz & Strack, 1991; Stiglitz, Sen & Fitoussi, 2009). Global life satisfaction scales have produced widely conflicting findings. A prominent example is the so-called Easterlin paradox, where some authors found that happiness levels across countries show no relationship with the level of economic development of a country (Easterlin, 1974, 1995) while others found a monotonic relationship between economic development and subjective well-being (Deaton, 2008; Kahneman & Deaton, 2010; Stevenson & Wolfers, 2008).

Alternative subjective well-being survey items have been proposed in the literature. Although their classification has been somewhat controversial (Kahneman & Riis, 2005) most of the psychology literature thus far has conceptualized subjective well-being either as the evaluation of life satisfaction/dissatisfaction (evaluative well-being measures) or as the combination of experienced affect - range of emotions from joy to misery- (experienced well-being measures). These two types of well-being measures are the focus of this paper. We also added, however, a third type of measure, a `eudemonic' category to our study to fit the United Kingdom's Office for National Statistics classification (Dolan et al., 2011) as will be explained below.

Broadly, the evaluative component of subjective well-being includes the elicitation of a respondent's global subjective evaluation of his or her life, where the evaluation can also be limited to specific domains of life, such as satisfaction with work, family life, or health (Dolan et al., 2011). Typically, these questions are formulated as single item self-reports, formulated for example as "All things considered, how satisfied are you with your life as a whole these days?" or "Taken all together, would you say that you are very happy, pretty happy, or not too happy?" (Krueger & Schkade, 2008). More recent surveys however have included multiple questions eliciting evaluative well-being. Perhaps most widely used among the latter is the Satisfaction with Life Scale, which measures life satisfaction by asking respondents to report their level of agreement with five statements on a seven-point scale from strongly disagree to strongly agree (Diener, 2000; Diener et al., 1985). Though the response time to single global life satisfaction questions is lower than for multi-item measures, as one would expect, the latter appears to be more reliable. Typically, it is assumed that life satisfaction should not show large variation within short periods of time. When evaluating the reliability of evaluative measurements over time, the Satisfaction with Life Scale displays an estimated reliability – that is, the correlation across waves – of about 0.8 (Eid & Diener, 2004; Krueger & Schkade, 2008), compared with single item global life satisfaction measures that have an estimated reliability of about 0.60. Evaluative questions are the most frequently used survey items within the field of subjective well-being (Kahneman & Krueger, 2006). For instance, most of the large longitudinal ageing surveys have included this type of life satisfaction measures in their questionnaires. The Health and Retirement Study (HRS) and the English Longitudinal Study of Aging (ELSA) include Diener's 5 item Satisfaction with Life Scale (Diener et al., 1985). The HRS and the Survey of Health, Aging and Retirement in Europe (SHARE) included a single item overall life satisfaction question in their core interviews. Other measures of evaluative well-being often used in studies include Campbell's domain-specific life satisfaction (Campbell, Converse, & Rodgers, 1976) used in the Gallup Wellbeing Index: Standard of Living and Personal Life, and the Cantril Self-Anchoring Striving Scale (Cantril, 1966), often referred as Cantril ladder, used by the Gallup poll and the OECD.

While evaluative life satisfaction questions have been widely used, their meaning and research application remain controversial. As pointed out by Kahneman and Krueger (2006), life satisfaction is a global retrospective judgment, likely constructed only when asked, and partly

based on the respondent's current mood and memory (possibly affected by earlier questions in a survey) and by the immediate context in which it is asked, such as the weather that day. As a result, there is an increasing interest in also including measures of experienced well-being and affect in surveys. In contrast to evaluative subjective well-being measures that require an evaluative judgment from respondents, experienced well-being measures focus on how respondents are feeling (positive and negative affect) at a specific point in time. These experienced measures correspond to a rather Benthamite view of well-being, in that the latter depends entirely on individuals' feelings, though the list of feelings used in surveys is usually not limited to pleasure and pain (Dolan et al., 2011). Experienced well-being is thus based on real-time affect measurements (Kahneman, et al., 2006).

The Ecological Momentary Assessment (EMA) or Experience Sampling Method (ESM) and the Day Reconstruction Method (DRM) are examples of experienced well-being measurements. The ESM/EMA represent an application of experience sampling methods, whereby respondents are surveyed frequently through electronic diaries, while in their natural environment, thus granting this method the highest ecological validity – the subjects are in their "real life" environment, while avoiding retrospective distortion, making it the gold standard for measurements of well-being (Diener, 2000; Kahneman, et al., 2004a). Frequent measurements permit the detection of variation in affect over time and during particular activities, and thus yield high reliability and validity of measures (Csikszentmihalyi & Hunter, 2003). ESM/EMA are however very costly, place a high burden on respondents and are difficult to implement (Kahneman & Riis, 2005). The Day Reconstruction Method (DRM) has been developed to offer some of the advantages of ESM while being more practical, by combining a time-use survey with questions about affects for activities performed during the previous day (Kahneman et al., 2004b). DRM surveys can include details such as the type of activity, location, presence of other individuals and length of the activity for all activities listed by a respondent in his diary, or only for a subset, e.g. three randomized times or activities throughout the day, as the Princeton Affect Times Use Survey (PATS) or the American Time Use Survey (ATUS) have implemented. While the DRM involves the retrospective report on an emotional state, this survey design targets accurate recall, by leading respondents to retrieve specific episodes and emotions from memory (Kahneman, et al., 2004a). Studies have validated the results obtained through the DRM by comparing them with experience sampling methods (Kahneman & Krueger, 2006). Other

surveys, such as the Gallup World and Daily Polls aim at measuring experienced well-being simply by asking respondents about emotions experienced during the whole previous day instead of focusing on single activities.

Throughout the literature, the complementarity of evaluative and experienced measures of well-being is explained by the fact that both measures are likely correlated, though remaining empirically and conceptually different (Kahneman & Riis, 2005). However, more research is needed to understand how the concepts experienced well-being measures are capturing differ from those captured by evaluative measures that have been collected already. Comparing these two types of measures is one of the objectives of this paper.

Finally, the last category of well-being measures we will consider in this paper refers to "eudemonic" survey items. Eudemonic measures refer to the existence of underlying psychological needs, encompassing various dimensions of wellness, such as autonomy, personal growth, or purpose in life, which contribute towards well-being independently of any positive affect they may convey (Dolan et al., 2011; Ryff & Keyes, 1995). Ryff presents evidence of a certain degree of convergence between these "theory-guided" eudemonic well-being measures with the commonly used life satisfaction measures (Dolan et al., 2011; Ryff, 1989). The question "overall, to what extent do you feel that the things you do in your life are worthwhile?" is an example of eudemonic measure currently used by the Office of National Statistics in the UK (Dolan et al., 2011).

Overall, as pointed out by Krueger and Schkade (2008), despite the wide use of the different well-being measures presented above, surprisingly little attention has been paid to their reliability. More so, while each existing measure of subjective well-being appears to show some evidence of validity, the differences between each measure of well-being have not been explored systematically, as no large scale longitudinal or repeated cross-sectional survey including the various measures has been implemented (Diener, 2000; Dolan et al., 2011). This paper aims at filling these gaps in the literature by studying the results of two waves of well-being data we collected in the American Life Panel (ALP). This is the first time that all these different types of measures are collected jointly in a population survey. In particular, we designed two experimental modules that were fielded in the ALP including some of the evaluative and eudemonic well-being measures described above, as well as a number of experienced measures.

Our objective when choosing the measures for our questionnaires was to represent common well-being measures, often used or considered to be included in various studies, and with different time requirements for the respondents, in order to be able to compare the concepts they are capturing. Another important comparison we study is the use of different scales for the elicitation of well-being measures. Although the concepts asked in the different measures considered are in some cases the same, measures differ in the response scales used and so, we will study the correspondence across these different scales. Results of this analysis will be useful to inform studies that aim at using surveys including these different measures.

The remainder of the paper is structured as follows. The next section describes the data we are collecting and the experiment we have designed and implemented. Section 3 provides descriptive statistics as well as measures of reliability for various subjective well-being measures. In Section 4 we use factor analysis to explore the relation between those measures Section 5 focuses on the effect of different response scales on the dimensionality of subjective well-being found when applying factor analysis. Section 6 discusses external validity and compares how evaluative and experienced well-being differ in how they correlate with demographics. Section 7 concludes.

Data and Experiment

The RAND-USC American Life Panel (ALP)

To conduct this research, we use data collected in the RAND American Life Panel (ALP). At the time of the survey, the ALP consisted of approximately 5,500 respondents ages 18 and over who are interviewed periodically over the Internet. Respondents do not need Internet access to participate, although the majority of the panel members have their own Internet access. The remaining panel members (approximately 10% of the sample) have been provided Internet access by RAND through the provision of a laptop or a Microsoft TV2 and/or an Internet subscription, eliminating the bias found in many Internet surveys that include only computer users. The TV2 is an Internet player that allows respondents to open email accounts and browse the Internet. Sampling weights are also provided by the ALP to adjust for sample selection. Upon joining the panel, respondents complete an initial survey collecting individual socio-demographic information, work history and household composition information. They are asked to update their background information every quarter. About once or twice a month, respondents

receive an email with a request to fill out a questionnaire. Response rates average 70-80%. Since January 2006, researchers have fielded over 300 surveys, and published papers using these data on a wide variety of topics, for instance subjective probabilities and expectations (Delavande & Rohwedder, 2008; Manski & Molinari, 2010) , life satisfaction (Kapteyn, Smith, & Van Soest, 2010) and financial literacy (Bruine de Bruin et al., 2010; Fonseca, Mullen, Zamarro, & Zissimopoulos, 2010; Lusardi & Mitchell, 2008).

Apart from its flexibility and cost effectiveness in collecting new data, an important advantage of the ALP is that it also allows researchers to easily link newly collected data to data from other modules, both past and future. We make use of this feature in this paper by designing two experimental modules that were administered in the ALP. The first module was administered from the beginning of May 2012 until July 2012, while the second module started to be administered at the end of May 2012 and was in the field until early August 2012. 4339 respondents answered our module for the first wave out of 5495 eligible respondents, resulting in a response rate of 79%. Respondents who completed the first wave were then invited to answer questions in the second wave. Out of 4336 eligible respondents (3 respondents of the first wave were not available for the second wave), 4031 respondents answered the module for the second wave, resulting in a response rate of 93.3%. The following sections describe the well-being measures collected in these modules as well as the experiment that we designed and implemented.

Well-being Measures in our questionnaires

In the two modules we fielded in the ALP, we administered four sets of evaluative well-being measures and three sets of experienced well-being measures.[1] The evaluative well-being measures in our modules include the following: Diener's 5 item Satisfaction with Life Scale (Diener et al., 1985), in exactly the same form as it is included in the Health and Retirement Study (HRS) and the English Longitudinal Study of Aging (ELSA); a single item overall life satisfaction question, identical to the one included in the Survey of Health, Aging and Retirement in Europe (SHARE); Campbell's domain-specific life satisfaction (Campbell et al., 1976) used in the Gallup Wellbeing Index: Standard of Living and Personal Life, and the Cantril Self-Anchoring Striving Scale (Cantril, 1965), often referred as Cantril ladder, used by the Gallup

[1] See Appendix A for detailed questionnaires.
[2] Alternatively, we could have estimated a Random Effects model; the results of that specification are virtually

poll and the OECD. In addition to these, we also included four ELSA questions taken from the U.K. Office of National Statistics (ONS) which comprise one evaluative life satisfaction question, one eudemonic question and two experienced well-being questions related to feelings of happiness and anxiety during the previous day. Although two of the ONS-ELSA questions are experienced well-being questions, they are included in the evaluative measures group, as we seek to maintain a questionnaire structure as close to the original as possible. We will see however that in the analyses these questions behave differently than the evaluative measures, as one would expect.

Our ALP modules also included three sets of experienced well-being measures to be compared with the evaluative well-being measures described above, as well as among themselves. Our first set of experienced well-being measures comes from the Gallup-Healthways Well-being index. These questions collect information about positive and negative affect experienced yesterday. Our second group of experienced questions is based on ELSA's simplified version of the Day Reconstruction Method collecting information about activities in the last day and how individuals felt when doing these activities. Finally, we also include questions from the so called HWB12, a newly developed experienced well-being measure by Jacqui Smith and Arthur Stone (2011), which has been included in the 2012 HRS. The HWB12 is a measure of 12 overall experiences of hedonic well-being referring to the previous day. The authors recommend asking wake and sleep times as a minimal check that participants focus attention on remembering the previous day. Finally, in order to facilitate the crosswalk across different experienced measures we included different sets of additional questions to each of the evaluative measures described above. Our questionnaires also included questions about respondents' major life events taken from the HRS, but these will not be analyzed in this paper.

Experiment

As explained above, we fielded two waves of the ALP where we administered four evaluative well-being measures and 3 sets of experienced well-being measures. All evaluative well-being questions were asked in both waves.

In each of the two waves, respondents answer one set of experienced well-being measures, randomly assigned. So no one responds to all three experienced measures. We do make sure however that all possible combinations of experienced measures occur across the two

waves. To be more precise: Respondents are randomized into one of nine different groups for the experienced well-being measures: group 1-1 for example will see the Gallup questionnaire in both waves, while group 2-3 will see the ELSA questionnaire in the first wave, and the HWB-12 questionnaire in the second wave. This will apply for all combinations, i.e. 1-1, 2-2, 3-3, 1-2, 1-3, 2-1, 2-3, 3-1, 3-2.

All questions are reproduced in Appendix A; as one can see from Appendix A, for each of the experienced measures respondents get a number of additional questions. The reason for this is as follows. The experienced measures differ in a number of ways. These include differences in the list of included items and differences in response scales. To be able to isolate the effects of differences in items and differences in response scales, we have added items to each of the experienced measures such that in each case a respondent answers exactly the same items. This allows us to look at both the effect of response scales (the different measures have different response scales, but the respondent answers the same items for every response scale) and at the effect of the item choice (we can compare results with and without additional items).

Descriptive statistics

Table 1 shows the response duration of different well-being measures we collected for the modules included in the ALP. Since respondents don't have to take a survey in one sitting, total survey times sometimes may seem extremely long. To exclude such cases we omit observations for which total time exceeds 30 minutes (taking a more generous limit, like one hour, does not change results much). The table shows that the experienced well-being measures (HWB12, Gallup and ELSA) all take less than 3 minutes on average, with the exception of ELSA, which is the only one that asks for activities first and then asks for affect for each reported activity. The evaluative measures (Cantril, Diener, SHARE and ONS) take very little time, not surprisingly. There is not much difference in duration across the waves. The largest absolute (and relative) difference is found for ELSA's experienced well-being measures where respondents took about half a minute less on average to answer this module in the second wave. Respondents requiring less time to answer those questions in the second wave could be due to three factors. First, they could have different reference periods in the two waves, e.g. the prior day being a Sunday in the first wave, while it could be a workday in the second wave. When restricting the durations to respondents answering both waves with similar reference periods (two

weekend days or two work days), the difference persists, which leads us to discard this hypothesis. A second hypothesis suggests that respondents may have shortened their survey time by reporting fewer activities in the second wave, after having experienced follow-up questions for all activities in this module in the first wave. We find however no evidence supporting this hypothesis: there is no statistically significant difference in the proportion of total activities reported for respondents with weekends and workdays in both waves (see Appendix B). We thus suspect that respondents must have gotten familiar with the format of the questionnaire, in particular the reporting of time spent on each activity. When looking at the group of respondents who answered the ELSA module in both waves, we observe a difference of 41 seconds on average between both waves, indicating that the respondents were indeed able to respond more quickly the second time they had to answer.

Test-retest Reliability of Measures

One question of interest when fielding a survey on subjective well-being questions is the reliability of the resulting measures. We follow Krueger and Schkade (2008), and use a classical measurement error model $y_i = y_i^* + \epsilon_i$, where y_i is the observed well-being item measure, y_i^* is the true value of the well-being item measure and ϵ_i is an error term assumed to have expectation zero. This set-up suggests a definition of the reliability ratio as $r = corr\left(y_i^1, y_i^2\right)$, where the superscripts refer to the waves in which the variables are measured. The reliability is thus measured here as a test-retest correlation between two waves of data, where the interval in our sample is at least two weeks.

Table 2 shows the reliability ratios for all the evaluative subjective well-being measures. Overall, we observe that the Diener Satisfaction With Life Scale shows a reliability of about 0.80, which is very close to the estimate of 0.82 by Diener et al. (1985) who used an interval of 2 months, and the estimate by Alfonso et al. (1996) of 0.83, where the interval was 2 weeks between both measurements. The single item scales for evaluative well-being yield correlations on the order of 0.67. The two ONS questions about yesterday are really experienced measures, as discussed earlier and we observe lower correlations reflecting that the specific reference to "yesterday" should pick up real changes in affect between different days. The Gallup measures referring to 5 years ago or 5 years in the future show lower reliability ratios than the one

referring to the present, indicating possible error in recall of one's situation five years ago and uncertainty about one's future.

We also looked at correlations between the measures for experienced affect on the previous day presented in Table 3. As expected, we found lower correlations between waves, since changes may reflect both random measurement errors and true changes between the two days to which the affect measures refer. Notice that the table shows correlations for all items, i.e. we include both the original items of each scale and the items added from the other scales. Recall that we did this so that we are able to compare response scale effects across a common set of items. (We have indicated the additional items by underlining the correlations). Thus, a point of interest is to relate differences in correlations to differences in response scales (both the wording and the number of points on the scale).

The binary scale used in the Gallup survey shows somewhat lower correlations across waves overall, with correlations between 0.28 and 0.49, in comparison with the five and six point scales used in the HWB-12 and ELSA questionnaires respectively. The ELSA scale shows correlations ranging from 0.33 to 0.55, while the HWB12 scale shows correlations between .42 and .59.

The Relation between Evaluative and Experienced Well-Being Measures

There is a lively debate in the literature on the dimensions of well-being and what different measures are capturing (for a review, see Diener, 2000). Uniquely, our data bring together many of the currently used subjective well-being measures and thus allow us to investigate how they are related. To determine the relation between the various measures we will conduct a number of different factor analyses.

As noted, we have all evaluative measures for all respondents, but each experienced measure is only available for a randomly chosen five ninth of the sample. In their original form, the Gallup and HWB12 measures are straightforward to use, since they produce ratings of a number of affect items. The ELSA questionnaire is more complicated to analyze as it asks for ratings for a number of activities during the previous day. We concentrate therefore initially on analyses of the Gallup and HWB12 measures. (We will not analyze the ELSA measures, but when considering the effect of different response scales, we will use the ELSA scale when

asking about affect yesterday, analogous to Gallup and HWB12). Both analyses cover all evaluative measures as well as their respective experienced measures. We performed a factor analysis using principal components. In all cases factors are rotated orthogonally using the varimax method while we retain factors with eigenvalues greater than one.

Table 4 presents the results for the Gallup case. The evaluative measures are grouped together in the upper part of the table and the Gallup experienced measures at the bottom. Large factor loadings are indicated in bold.

Three factors are retained. The evaluative measures form one factor, while the Gallup experienced measures appear to represent two factors. The factors representing experienced well-being form one positive and one negative affective dimension thus confirming that negative affect is not just the negative of positive affect. ONS-happy (Overall, how happy did you feel yesterday?) loads mainly on the evaluative first factor. Although the phrasing of the question would squarely put it in the experienced well-being domain, its location in the survey (right after an evaluative question, see Appendix) may have induced some respondents to use a global evaluation rather than focusing on yesterday's affect.

Notably, ONS_worthwhile ("Overall, to what extent do you feel that the things you do in your life are **worthwhile**?") does not appear to represent a different factor from the evaluative well-being factor. ONS-anxious loads on the negative affect factor, but with a surprising negative sign.

Table 5 shows the results for the case where we compare the evaluative measures and the HWB12 experienced measures. In this case four factors are retained. Again the first factor represents evaluative well-being; the second factor now represents negative affect, while the third factor represents positive affect. The fourth factor mainly receives loadings from tired, bored, and pain. These are all items that are not included in the Gallup item list. The items happy (Yesterday, did you feel happy?) and content (Yesterday, did you feel content?) load on all of the first three factors (negatively on the second, negative, factor), while lonely (Yesterday, did you feel lonely?) loads negatively on factors 1 and 3, and positively on factors 2 and 4. ONS_happy loads on all of the first three factors, but negatively on the negative factor.

Thus, we find that the Gallup items yield three dimensions of well-being, while the HWB12 items can be represented by four underlying dimensions. There are two main differences

between Gallup and HWB: both the included items and the response scales differ. To be able to distinguish between the two effects, we next show the results of factor analyses when we include a set of common items, which only differ in the response scales used.

The Effect of Responses Scales

As noted in Section 2, we have added questions at the end of various experienced well-being modules to allow for cross walks between different instruments. As a result of this, respondents who received the HWB-12 module, the Gallup module, and the respondents who received the ELSA module answered the same items in number and nature, but with different response scales. The response scale in the HWB-12 questionnaire is of the form (taking "happy" as an example): "Yesterday, did you feel **happy**? Would you say: not at all, a little, somewhat, quite a bit or very." The response scale used in the module added to ELSA is of the form: "Overall, how did you feel **yesterday**? Rate each feeling on a scale from 0 – did not experience at all – to 6 – the feeling was extremely strong". And finally, the Gallup question reads: "Did you experience **happiness** during a lot of the day yesterday? Yes or no".

Thus, these items include both the original items of each scale and the items that were taken from the other scales. Tables 6, 7 and 8 therefore all include 15 experienced "concordance" measures – all with different scales matching the original survey design -, as well as 13 evaluative measures.

Table 6 displays the results of the factor analysis for evaluative and experienced measures for the Gallup scale. Five factors emerge when keeping factors with eigenvalues greater than one. The evaluative measures form, similar to the previous analysis, one factor. The second factor groups the positive experienced measures (Happy, Interested, Enthusiastic, Content and Joyful), while factors 3, 4, and 5 represent negative experienced measures. Factor 3 mainly represents frustration, anger, stress and worry, while factor 4 represents sadness, anger, loneliness, boredom and depression. Tired and Pain are grouped as a separate factor. As in Table 4, ONS-anxious loads on the negative factor but with a counter-intuitive sign.

We repeat this factor analysis using the HWB-12 scale. This time, 4 factors remain: one evaluative factor (factor #1), a negative factor (factor #2, frustrated, sad, angry, stressed, worried, depressed), a positive factor (factor #3), and a factor grouping items somewhat related to fatigue (tired, lonely, bored, and pain in factor #4). ONS-anxious now loads on the second (negative) factor with the expected sign.

Finally, when conducting the same analysis with the ELSA scale, only three factors remain (Table 8). The first is again evaluative, the second negative, while the third one is positive. Recall that the ELSA questionnaire actually gauges time use and then asks experienced affect about a number of episodes. In this paper we don' t use the information about the experienced affect by episode; we only use the ELSA scale to ask about affect yesterday (as in Table 3).

We thus find that the number of factors retained is quite sensitive to the scales used. The binary Gallup scale yields five factors, the five-point HWB12 scale yields four factors and the seven-point ELSA scale yields three factors. This finding appears consistent with the older factor analysis literature where it has been observed that using categorical variables may lead to more factors, particularly if the distributions of the variables are skewed. See, e.g. Lord and Novick (1968) or Olsson (1979). In comparison with Tables 4 and 5, where only original items were included, HWB12 yields the same number of factors (4), but Gallup yielded 3 factors when its original items were included, while with the common set of items the Gallup scale yields 5 factors. Thus the fewer factors found in Table 4, are most likely due to the limited number of items included. For instance Bored, Tired, Pain, and Lonely are missing from the original Gallup scale and indeed these contribute substantially to factors 4 and 5 in Table 6.

In Tables 6-8, the experienced measures differ in the scales used, but the evaluative measures (and their scales) do not vary. To further investigate the effect of scale differences, we repeat the analyses of Tables 6-8 with only the experienced measures.

ELSA-scale

Based on the criterion of retaining factors with eigenvalues greater than one, two factors are retained, as shown in Table 9. This is consistent with Table 8 where three factors were retained, one evaluative factor and two experienced factors.

HWB12-scale

Table 10 presents the results for the factor analysis of the extended HWB12 experienced well-being measure. Now three factors are retained. This is consistent with Table 7, where four factors were retained. As in Table 7, Tired, Lonely, Bored and Pain are forming a separate factor ("fatigue") while Factor 1 taps the remaining negative, troubled emotions. Factor 2 taps positive emotions.

Gallup scale

Table 11 presents the results for the factor analysis of the extended experienced well-being measures, using the binary Gallup scale. Note that three original items are dropped, asking whether the respondent smiled or laughed a lot, was treated with respect, or would wish to have more days just like yesterday. Three factors are now retained, one less experienced factor than in Table 6. Tired, Bored and Pain are forming a separate factor (we call this factor "fatigue"). In Table 6, Bored loaded on a different factor. Factor 1 taps the remaining negative ("troubled") emotions, while factor 2 taps positive emotions.

A number of preliminary conclusions emerge. For the HWB12 and ELSA scales results are similar, independent of whether the evaluative measures are included in the factor analysis or not. The ELSA scale generates two experienced affect dimensions: one positive and one negative. The HWB12 scale generates three experienced affect dimensions: one positive and two negative. The Gallup scale yields different outcomes depending on whether one includes the evaluative measures in the factor analysis or not. When we include the evaluative measures we find four experienced affect dimensions, but when we perform factor analysis on the experienced measures only, just three factors are found. In the latter case, the fourth eigenvalue is .98, so still very close to the cut-off point of 1.

External Validity of the Evaluative and Experienced Well-Being Scales

The external validity of the evaluative measures can be investigated by estimating models where the response to each question is regressed on demographic variables, including race, gender, education level, age group, having a partner, as well as socio-economic variables such as income bracket and working status, while we also include self-reported health and number of children in the household in our model. Formally, we specify the following model:

$$Y_{it} = \beta X_{it} + \epsilon_{it}$$

where X_{it} is a vector of covariates, while ϵ_{it} represents random error uncorrelated with the observable covariates. The subscript t indicates the wave (1 or 2) and i indexes the respondent. We allow for correlation of ϵ_{it} across the two waves ($t = 1$ or $t = 2$) by clustering standard errors on individuals[2]. The simple equation specified here is not meant to provide a complete model of

[2] Alternatively, we could have estimated a Random Effects model; the results of that specification are virtually indistinguishable from the results we obtain with the current specification.

determinants of well-being and indeed one can imagine that causality sometimes runs from well-being to some of the right hand side variables. It is of interest nevertheless to investigate if the well-being measures covary with other variables in a plausible manner and to see if the relation between well-being and the right hand side variables is the same for each measure.

Table 12 shows the results for the evaluative measures. We have omitted the Gallup measures for five years ago and five years in the future; similarly for ONS we have only included the one true evaluative measure "Satisfied". Given the different reference time frame used by those Gallup items and the experienced and eudemonic measures of the ONS scale, we chose to include only items referring to a short reference period and involving evaluative measures. Looking at the effects of gender, we observe that these vary by outcome measure and are mostly insignificant. Men are more likely than women to agree with the statement "If I could live my life again, I would change almost nothing". There currently is no consensus in the literature on the nature of differences in subjective well-being by sex, as some studies have shown higher levels of happiness for men (Haring et al., 1984) which could be related to higher prevalence of depression in women than men (Diener et. al., 1999), while others have found that women report higher happiness (Alesina et al., 2004), and yet other studies have found no evidence of gender effects on subjective well-being (Louis and Zhao, 2002; Dolan et al., 2008). Having a partner increases life satisfaction according to all measures. This result has also been found by others in the literature (see e.g. Dolan et al., 2008; Blanchflower and Oswald, 2004). The presence of children in the household does not seem to consistently affect the well-being of the respondent, though as pointed out by Deaton and Stone (2013), this could be a function of controlling for factors associated with having children, such as being married, richer, and healthier. The results also show that by and large Blacks and Hispanics report higher subjective well-being than non-Hispanic Whites. Concerning education, the reference category for the education variables is "graduate education". Although many coefficients are not statistically significantly different from zero, all significant coefficients confirm Oswald and Blanchflower's finding of a positive relationship between education and well-being (2004).

Subjective well-being increases monotonically with income according to all evaluative measures. In comparison to the reference category of respondents reporting an income above $100,000, we observe large negative and statistically significant coefficients for most lower

income groups. The size of those coefficients suggests an almost linear relationship between income and subjective well-being measures in this income range. A positive relation between income and subjective well-being has been found many times in the literature, with existing research suggesting positive but diminishing returns to income (Dolan et al., 2008).

The reference category for age consists of respondents over 65. Several studies have suggested a "U-shape" in age with the lowest life satisfaction occurring in middle age (Dolan et al., 2008; Blanchflower and Oswald, 2004). By and large that pattern is confirmed for the various well-being measures in the table. We observe that self-reported health – here coded as 1 being Excellent, and 5 Poor so that a negative sign represents a higher level of health - is strongly correlated with well-being, which corresponds to general findings in the literature (Diener et al., 1999; Helliwell, 2003).

With regards to working status, we used the category "working now" as a reference group, so that the results for individuals who are retired, disabled, unemployed, or in a different working situation (homemakers, or on sick leave, temporarily laid-off or other) represent differences with "working now". Consistent with the literature, we observe a strong negative effect of being unemployed (see for instance Clark and Oswald (1994), Stutzer (2004) or Di Tella et al (2001)). We also find a negative effect for being disabled, which appears in line with studies challenging the theory of hedonic adaptation whereby individuals suffering major changes in life circumstances, such as the onset of a disability, return to baseline levels of happiness (Lucas, 2007). We also confirm prior findings (Kim and Moen, 2002) of a strong positive relation between being retired and subjective well-being. Being in "Other work" has a positive, though not always significant, effect on subjective well-being.

Finally, the last five rows show the p-values of joint significance tests for each category of characteristics. We cannot reject the hypothesis of no difference between the education categories except for the question "So far, I have gotten the important things I want in life". Virtually all other categories are jointly significant.

The coefficients in Table 13 are not directly comparable across columns as the dependent variables are measured on different scales. However if the scales would be the only difference between the dependent variables, then coefficients in different columns should be fixed multiples

of each other. Table 13 summarizes the results from tests of proportionality of coefficients across the various models in Table 12. The Null Hypothesis for all the tests is formulated as follows: $H_0 : \frac{\beta_{1,model1}}{\beta_{1,model2}} = \frac{\beta_{2,model1}}{\beta_{2,model2}} = \frac{\beta_{3,model1}}{\beta_{3,model2}}$, etc. We observe that out of all ten possible combinations the Null Hypothesis of proportionality of coefficients gets rejected at the 5% level four times. All four rejections involve either the Diener scale based on averaging the item scores or the Diener scale based on factor analysis[3]. Inspecting the five items that constitute the Diener scale makes it clear that only one item ("I am satisfied with my life") corresponds with the simple one shot questions of SHARE, ONS, and Gallup. This suggests that the Diener scale measures a somewhat broader concept of evaluative well-being than the other three measures. Yet, remarkably in the factor analyses presented earlier, it appeared that the items on the Diener scale all loaded on the same overall satisfaction scale.

Table 14 shows the results of regressions where the dependent variables are scales based on factor loadings from factor analyses presented in Tables 9-11. So in all cases the scales are based on the common set of items. It is of interest to not only compare the scales (which are only different because of differences in response scales), but also between the experienced scales and the evaluative scales, for which regressions were presented in Table 12. We observe that in contrast to the evaluative well-being results, there is some indication of lower subjective well-being among males. For both the ELSA and HWB12 scales males score higher on the negative affect ("Troubled") scale (but marginally significantly negative for the Gallup scale). Having a partner has little effect on experienced well-being (although the HWB12 scale suggests a somewhat lower score on the "Fatigue" scale), in contrast to the findings for the evaluative well-being scales where the presence of a partner has a strong positive effect.

The effect of ethnicity is hard to summarize. According to the ELSA scale Hispanics and Blacks experience more positive affect compared to whites and non-Hispanic whites. According to the Gallup scales Blacks and Hispanics experience less positive affect, while the HWB12 scale shows no significant effects of ethnicity on positive affect. For blacks we find more negative affect for the Gallup scale. Hispanics are less troubled according to the Gallup scale and more tired according to the HWB12 scale. Education also shows patterns that vary by response

[3] Factor analysis of the Diener items yields one factor with eigenvalue greater than one (the eigenvalue equals 3.69)

scale. The ELSA and Gallup scales show few significant effects. The HWB12 scale suggests that individuals with lower education experience less positive affect, while they are also less troubled, but more tired, bored and suffering from pain.

The most striking contrast between evaluative and experienced well-being is in the effect of income. Whereas for evaluative well-being we observe a strong positive relation with income, such a relation is hardly discernible for experienced well-being. This result is somewhat stronger than earlier findings by Kahneman and Deaton (2010), who found that while life evaluation items rise steadily with socio-economic status whereas experienced measures of well-being do not improve beyond an annual income of approximately $75,000. Here we find no evidence of a relation with income at all. Similarly, we observe that the U-shaped relation with age that we observed for evaluative well-being does not show up for experienced well-being. The results for labor market status show few consistent patterns across scales. As with evaluative well-being, health is an important determinant of experienced well-being. Both the ELSA and the HWB12 scale show that better health is associated with more positive affect and less negative affect (remember that Health is coded 1-5, so that a higher number means less good health). However for the Gallup scale the effects are reversed.

Joint tests of significance for each category of respondent characteristics do not reject the null of no effect for education (with the exception of the HWB12 factors), income, age (with the exception ELSA "Troubled/Fatigue" scale and the HWB12 factors), and race (with the exception of ELSA "Positive" and Gallup "Troubled" and "Positive"). Work status shows the strongest effects. Only Gallup "Positive" and HWB "Positive" do not show a significant relation.

Table 15 presents results of proportionality tests of coefficients in the various columns of Table 15, analogous to the results presented in Table 14. Since the positive and negative affect scales are assumed to tap different dimensions, we would not expect the proportionality hypothesis to hold for the different affect scales within ELSA, Gallup, and HWB. For ELSA and HWB12 that is indeed the case, p-values are .02 and .04 respectively. For Gallup this does not seem to be the case however: the null of proportionality between the three different affect scales does not get rejected. A second relation of interest is to see if the positive affect scales across ELSA, Gallup, and HWB12 satisfy proportionality. That indeed is confirmed by the entries in the table; p-values are .77, .59, and .92. Thirdly we consider the negative affect scales. Here the

expected patterns are somewhat less clear-cut as the negative affect scales vary somewhat across ELSA, Gallup, and HWB12. We do observe that the null of proportionality between ELSA Troubled/Fatigue and the Gallup and HWB12 Troubled and Fatigue scales gets easily accepted. Similarly we can accept the null of proportionality between HWB12 Troubled and Gallup Troubled, and between HWB12 Fatigue and Gallup Fatigue. On the other hand HWB12 Troubled and Gallup Fatigue do not pass the null of proportionality, indeed suggesting that these scales measure something different.

Conclusions

It is increasingly understood that traditional economic measures are necessary, but not sufficient, to measure societal progress (Stiglitz et. al, 2009). Accordingly, in recent decades, research interest has been rising to find broader measures of well-being to be used to monitor societal progress and evaluate policy. The literature thus far has conceptualized subjective well-being either as the evaluation of life satisfaction/dissatisfaction (evaluative well-being measures) or as the combination of experienced affect (range of emotions from joy to misery).

In this paper, we conducted an experiment to investigate the relations between a number of evaluative and experienced measures (and one eudemonic measure), using the American Life Panel (ALP). This is the first time that all these different types of measures have been collected jointly in a population survey. Although the concepts asked in the different experienced measures included in our experiment are in some cases the same, measures differ in the scales of their questions and so, we also studied the correspondence across these different scales. The experiment confirms a number of findings in the literature and yields some new results.

We find that all evaluative measures load on the same factor. Although this would suggest that there is not much to choose among them, the tests results presented in Table 14, show that the Diener scales (both the one based on averaging items and the one based on factor analysis) have a different relation with demographics and self-reported health than the other three single item scales. Hence, for analyses of determinants of subjective well-being it does matter which measure one uses. The ONS flourishing (eudemonic) measure does not seem to represent a separate factor; it mainly loads on the common evaluative factor.

The positive and negative experienced affect measures load on different factors, thus confirming that positive and negative affect are not simply opposite poles on the same scale. Depending on the scale used, we find that negative affect can be represented by one or two factors. The ONS_happy measure loads both on the evaluative factor and on both the positive and negative affect factor. It is not entirely clear why this happens, but one possibility is the design of the ONS questionnaire, which places this experienced measure directly behind an evaluative question. Both previous points suggest the need for more work on the structure of questionnaires (response scales, lay-out, question order, etc.).

The relation of evaluative and experienced measures with demographics is markedly different. For instance, evaluative well-being increases monotonically and almost linearly with income; for experienced well-being no such relation with income is found. Evaluative well-being shows a U-shaped relation with age, while for experienced well-being no such relation is found. Also, health and labor market status, which have clear and significant effects on evaluative well-being, do not appear to have much of a consistent influence on experienced well-being. Whether one finds a relation or not appears to depend on the kind of response scale used in eliciting items. In general terms however, it appears that the relation between experienced measures and demographics is much weaker than between evaluative measures and demographics.

The paper pays a fair bit of attention to the effect of scales used for the affect measures. The different scales imply a different number of underlying factors and different relations with demographics. This is clearly undesirable given that they all are based on the same items: The relation between experienced well-being and personal circumstances and demographics should not depend on whether we use a binary scale, a five-point scale, or a seven-point scale. In a number of ways the ELSA seven-point scale appears to behave better than the other coarser scales (especially the Gallup scales). Partly this can be ascribed to the fact that with finer scales, respondents can express their feelings in a more nuanced way, while assumptions of underlying normal distributions (which motivate many of the statistical procedures) will be closer to being satisfied by the data.

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Appendix A: Tables

Table 1

Duration in Minutes of Different Well-Being Modules

Survey Module	First wave	Second wave
HWB12	2.64	2.76
Gallup	1.92	1.88
ELSA	6.43	5.57
Cantril (Gallup)	1.24	1.13
Diener	1.33	1.17
SHARE	0.20	0.19
ONS	0.86	0.81

Note: Duration for respondents with time lower or equal to 30 minutes for the whole questionnaire.

Table 2

Reliability Ratio of the Evaluative Subjective Well-Being Measures. (n=3938)

Satisfaction With Life Scale	r
In most ways, my life is close to ideal.	0.68
The conditions of my life are excellent.	0.72
I am satisfied with my life.	0.73
So far I have gotten the important things I want in life.	0.67
If I could live my life over, I would change almost nothing.	0.65
Diener scale[4]	0.79
SHARE	
How satisfied are you with your life in general?	0.67
Gallup	
On which step of the ladder would you say you stood 5 years ago?	0.59
On which step of the ladder would you say you stand now?	0.71
On which step of the ladder would you say you will stand on in the future, say about 5 years from now	0.66
ONS	
Overall, how satisfied are you with your life nowadays?	0.74
Overall, how happy did you feel yesterday?	0.57
Overall, how anxious did you feel yesterday?	0.45
Overall, to what extent do you feel that the things you do in your life are worthwhile?	0.65

[4] Computed as the average of the five Satisfaction With Life items.

Table 3

Correlations across Waves of Experienced Subjective Well-Being Measures.

	ELSA	Gallup	HWB-12
	n=443	*n=477*	*n=415*
Happy	0.50	0.36	0.49
Interested	0.49	0.32	0.42
Content	0.40	0.39	0.54
Joyful	0.46	0.34	0.53
Enthusiastic	0.45	0.34	0.53
Frustrated	0.44	0.45	0.49
Sad	0.43	0.45	0.51
Angry	0.33	0.28	0.43
Tired	0.45	0.49	0.47
Stressed	0.43	0.41	0.50
Lonely	0.45	0.45	0.45
Worried	0.45	0.45	0.52
Bored	0.38	0.28	0.47
Pain	0.50	0.49	0.52
Depressed	0.55	0.41	0.59

Note: Underlined correlations refer to items that have been added to the original scale; correlations in bold indicate the highest and lowest values in each column.

Table 4.

Factor Analysis: Evaluative Well-Being and Gallup (Original) Experienced Well-Being (2,724 observations).

			Factor 1	Factor 2	Factor 3
Evaluative measures	Diener	Ideal life	0.8444	-0.1733	0.1178
		Excellent conditions	0.8418	-0.1836	0.1352
		Satisfied	0.8684	-0.2143	0.1467
		Important things	0.7741	-0.0999	0.1444
		Change life	0.7020	-0.0984	0.0280
	SHARE	Satisfaction w life	0.7953	-0.2094	0.1600
	ONS	Satisfied nowadays	0.8574	-0.2373	0.1868
		Happy	0.6055	-0.4860	0.3437
		Anxious	-0.2000	0.0660	-0.6268
		Worthwhile	0.6754	-0.3098	0.0896
	Gallup	5 years ago	0.3736	0.1720	0.2331
		Now	0.8461	-0.2013	0.2029
		5 years in future	0.6494	-0.2589	0.0018
Experienced measures		Happy	-0.3308	0.7785	-0.1987
		Interested	-0.1618	0.5397	0.0947
		Joyful	-0.3114	0.7738	-0.1927
		Sad	0.2862	-0.4429	0.5342
		Angry	0.1257	-0.2470	0.5678
		Stressed	0.1814	-0.2435	0.6933
		Worried	0.2908	-0.2344	0.6445
		Depressed	0.3211	-0.4114	0.5497
		Smile	-0.2559	0.7428	-0.1166
		More days like this	-0.2254	0.6818	-0.3656
		Treated w respect	-0.1357	0.2443	-0.4003

Table 5

Factor Analysis: Evaluative Well-Being and HWB12 (Original) Experienced Well-Being (2,628 observations).

			Factor 1	Factor 2	Factor 3	Factor 4
Evaluative measures	Diener	Ideal life	0.8304	-0.1475	0.1430	-0.0544
		Excellent conditions	0.8393	-0.1944	0.1240	-0.0532
		Satisfied	0.8552	-0.1951	0.1778	-0.0568
		Important things	0.7725	-0.1590	0.0626	-0.0553
		Change life	0.6817	-0.1247	-0.0337	-0.0140
	SHARE	Satisfaction w life	0.7783	-0.1838	0.1801	-0.0562
	ONS	Satisfied nowadays	0.8355	-0.2175	0.1860	-0.1259
		Happy	0.5956	-0.4473	0.3867	-0.1710
		Anxious	-0.1491	0.6386	-0.0616	-0.0823
		Worthwhile	0.6770	-0.0915	0.3178	-0.1114
	Gallup	5 years ago	0.3842	-0.0516	-0.2306	-0.2992
		Now	0.8348	-0.2292	0.1262	-0.1790
		5 years in future	0.6392	-0.0535	0.1827	-0.1073
Experienced measures		Happy	0.4356	-0.4125	0.6010	-0.0487
		Enthusiastic	0.3418	-0.2486	0.6789	-0.0116
		Content	0.4718	-0.4061	0.5352	0.0034
		Angry	-0.1516	0.7107	-0.1313	0.0817
		Frustrated	0.1940	0.7834	-0.1757	0.1238
		Tired	-0.1411	0.4244	-0.0695	0.5566
		Sad	-0.2992	0.6127	-0.3349	0.2332
		Stressed	-0.2085	0.8307	-0.1194	0.1244
		Lonely	-0.3027	0.3154	-0.4108	0.3526
		Worried	-0.2544	0.7623	-0.0984	0.1242
		Bored	-0.1823	0.0542	-0.4818	0.5596
		Pain	-0.1416	0.2527	0.0426	0.6777

Table 6

Factor Analysis: Evaluative Well-Being and Gallup (15) Experienced Well-Being (2,718 observations).

			Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Evaluative measures	Diener	Ideal life	0.8424	0.1622	0.1280	0.0595	0.0832
		Excellent conditions	0.8373	0.1649	0.1407	0.0621	0.1164
		Satisfied	0.8652	0.1808	0.1416	0.1267	0.0644
		Important things	0.7760	0.0738	0.1186	0.1571	-0.0620
		Change life	0.7134	0.0839	0.0592	0.0116	-0.0343
	SHARE	Satisfaction w life	0.7901	0.1688	0.1399	0.1390	0.1020
	ONS	Satisfied nowadays	0.8537	0.1801	0.1577	0.1702	0.1030
		Happy	0.6022	0.3982	0.3165	0.2597	0.1607
		Anxious	-0.2050	-0.0839	-0.6447	0.0210	-0.1205
		Worthwhile	0.6634	0.2633	0.0225	0.2328	0.1132
	Gallup	5 years ago	0.3846	-0.2142	0.1634	0.1180	-0.0803
		Now	0.8443	0.1441	0.1604	0.1715	0.0962
		5 years in future	0.6367	0.2353	-0.0154	0.0578	0.2265
Experienced measures		Happy	-0.3435	-0.7137	-0.2738	-0.1873	-0.0161
		Interested	-0.1406	-0.5552	0.1384	-0.1492	-0.1645
		Frustrated	0.1864	0.3002	0.6301	0.2125	0.1354
		Sad	0.2735	0.2725	0.4140	0.5427	0.0882
		Enthusiastic	-0.2564	-0.6925	-0.0870	-0.0854	-0.1353
		Content	-0.3123	-0.5984	-0.2956	-0.1422	-0.0521
		Angry	0.1247	0.1198	0.4634	0.4201	-0.0283
		Tired	0.1776	0.1303	0.3221	0.0903	0.6709
		Stressed	0.1812	0.2009	0.7324	0.0993	0.1307
		Lonely	0.2728	0.1461	0.1160	0.7210	0.0611
		Worried	0.2870	0.1689	0.6325	0.1995	0.1392
		Bored	0.1957	0.1894	-0.0133	0.6273	0.1963
		Pain	0.1692	0.0475	0.0860	0.1180	0.8037
		Depressed	0.2988	0.2427	0.4052	0.5780	0.1271
		Joyful	-0.3237	-0.7303	-0.2657	-0.1688	-0.0129

Table 7

Factor Analysis: Evaluative Well-Being and HWB12 (15) Experienced Well-Being (2,624 observations).

			Factor 1	Factor 2	Factor 3	Factor 4
Evaluative measures	Diener	Ideal life	0.8186	-0.1469	0.2038	-0.0510
		Excellent conditions	0.8283	-0.1940	0.1902	-0.0407
		Satisfied	0.8486	-0.2042	0.2031	-0.0682
		Important things	0.7617	-0.1485	0.1429	-0.0462
		Change life	0.6671	-0.1033	0.0971	0.0302
	SHARE	Satisfaction w life	0.7708	-0.1962	0.2008	-0.0756
	ONS	Satisfied nowadays	0.8301	-0.2287	0.2012	-0.1381
		Happy	0.5716	-0.4545	0.3955	-0.1918
		Anxious	-0.1349	0.6144	-0.1419	-0.1440
		Worthwhile	0.6640	-0.1094	0.2947	-0.1069
	Gallup	5 years ago	0.3555	-0.0043	-0.0122	-0.1969
		Now	0.8266	-0.2339	0.1735	-0.1140
		5 years in future	0.6300	-0.0677	0.1947	-0.1204
Experienced measures		Happy	0.3815	-0.3975	0.6574	-0.0940
		Interested	0.1718	-0.0208	0.7357	-0.1275
		Frustrated	-0.1862	0.7834	-0.1841	0.0880
		Sad	-0.2967	0.6624	-0.2232	0.2997
		Enthusiastic	0.2668	-0.2141	0.7782	-0.0699
		Content	0.4283	-0.3930	0.5729	-0.0297
		Angry	-0.1480	0.7113	-0.1300	0.0645
		Tired	-0.1260	0.4268	-0.1239	0.4560
		Stressed	-0.1907	0.8173	-0.1890	0.0650
		Lonely	-0.3164	0.3871	-0.1932	0.4665
		Worried	-0.2500	0.7640	-0.1191	0.0851
		Bored	-0.1901	0.1150	-0.2637	0.6573
		Pain	-0.1377	0.2687	0.0069	0.5735
		Depressed	-0.3258	0.6272	-0.2389	0.3490
		Joyful	0.3616	-0.2623	0.7412	-0.0717

Table 8

Factor Analysis: Evaluative Well-Being and ELSA (15) Experienced Well-Being (2,624 observations).

			Factor 1	Factor 2	Factor 3
Evaluative measures	Diener	Ideal life	0.8205	-0.1340	0.2144
		Excellent conditions	0.8380	-0.1460	0.1901
		Satisfied	0.8606	-0.1906	0.1909
		Important things	0.7674	-0.1438	0.1778
		Change life	0.6713	-0.0709	0.0976
	SHARE	Satisfaction w life	0.7796	-0.2210	0.2058
	ONS	Satisfied nowadays	0.8252	-0.2643	0.2496
		Happy	0.5625	-0.4310	0.4434
		Anxious	-0.1782	0.5300	-0.0788
		Worthwhile	0.6479	-0.1922	0.3060
	Gallup	5 years ago	0.3447	-0.1063	0.0451
		Now	0.8128	-0.2643	0.2323
		5 years in future	0.6186	-0.1001	0.2409
Experienced measures		Happy	0.3188	-0.3062	0.0768
		Interested	0.2317	-0.1013	0.7880
		Frustrated	-0.1543	0.8000	-0.2384
		Sad	-0.2317	0.7626	-0.1941
		Enthusiastic	0.2348	-0.1395	0.7989
		Content	0.3148	-0.2529	0.6863
		Angry	-0.1433	0.7480	-0.1430
		Tired	-0.1736	0.5982	-0.1047
		Stressed	-0.1590	0.7962	-0.1990
		Lonely	-0.2642	0.6354	-0.1326
		Worried	-0.2118	0.7755	-0.1437
		Bored	-0.2159	0.5005	-0.1904
		Pain	-0.1967	0.5227	0.0052
		Depressed	-0.3266	0.7432	-0.2350
		Joyful	0.2772	-0.1950	0.7976

Table 9

Factor Analysis: Experienced Well-Being, ELSA Scale (2,703 observations).

	ELSA 1	ELSA 2
	Troubled/Fatigue	*Positive*
Happy	-0.3196	0.8264
Interested	-0.0976	0.8245
Frustrated	0.8000	-0.2594
Sad	0.7917	-0.2423
Enthusiastic	-0.1321	0.8320
Content	-0.2617	0.7597
Angry	0.7605	-0.1552
Tired	0.6208	-0.1525
Stressed	0.7943	-0.2286
Lonely	0.6765	-0.2002
Worried	0.7841	-0.1947
Bored	0.5398	-0.2488
Pain	0.5700	-0.0577
Depressed	0.7845	-0.3114
Joyful	-0.2053	0.8429

Table 10

Factor Analysis: Experienced Well-Being, HWB12 Scale (2,690 observations).

	HWB12 1	HWB12 2	HWB12 3
	Troubled	*Positive*	*Fatigue*
Happy	-0.3960	0.7557	-0.1488
Interested	0.0111	0.7319	-0.1396
Frustrated	0.8052	-0.2309	0.1107
Sad	0.6807	-0.3042	0.3481
Enthusiastic	-0.1880	0.8200	-0.1060
Content	-0.3966	0.7021	-0.1197
Angry	0.7607	-0.1534	0.0468
Tired	0.3826	-0.1327	0.5050
Stressed	0.8178	-0.2460	0.1145
Lonely	0.3898	-0.2860	0.5297
Worried	0.7726	-0.1989	0.1610
Bored	0.0808	-0.2767	0.7025
Pain	0.2391	-0.0158	0.6307
Depressed	0.6445	-0.3208	0.4114
Joyful	-0.2603	0.8241	-0.1155

Table 11

Factor Analysis: Experienced Well-Being, Gallup Scale (2,788 observations).

	Gallup 1	Gallup 2	Gallup 3
	Troubled	*Positive*	*Fatigue*
Happy	-0.3721	0.7697	-0.0493
Interested	0.1190	0.6171	-0.2177
Frustrated	0.6671	-0.2902	0.1720
Sad	0.6635	-0.3565	0.1717
Enthusiastic	-0.1024	0.7373	-0.1652
Content	-0.3562	0.6537	-0.0807
Angry	0.6502	-0.1301	0.0228
Tired	0.2744	-0.1293	0.7053
Stressed	0.7055	-0.1661	0.1593
Lonely	0.4227	-0.3293	0.2689
Worried	0.6670	-0.2073	0.2166
Bored	0.1814	-0.3684	0.4283
Pain	0.1250	-0.0655	0.7736
Depressed	0.6716	-0.3400	0.2205
Joyful	-0.3432	0.7837	-0.0504

Table 12

Regression of Evaluative Well-Being Measure on Demographic and SES Variables

	Gallup	Diener					Diener scale		ONS	SHARE
		Ideal life	Excellent cond.	Satisfied	Important things	Change life	Factor	Average	Satisfied	Satisfied
Male	-0.00325	0.00743	-0.0572	0.00186	0.0904	0.184***	0.0223	0.0436	-0.0117	0.00297
	(0.0677)	(0.0608)	(0.0602)	(0.0616)	(0.0582)	(0.0710)	(0.0346)	(0.0538)	(0.0749)	(0.0271)
With partner	0.389***	0.297***	0.272***	0.404***	0.559***	0.426***	0.252***	0.397***	0.453***	0.163***
	(0.0786)	(0.0697)	(0.0680)	(0.0697)	(0.0672)	(0.0787)	(0.0392)	(0.0607)	(0.0862)	(0.0308)
Other	-0.142	-0.333*	-0.278	-0.334*	-0.308*	0.0729	-0.167*	-0.243	-0.196	-0.195**
	(0.196)	(0.182)	(0.172)	(0.182)	(0.165)	(0.175)	(0.101)	(0.156)	(0.214)	(0.0766)
Black	0.320**	0.167	0.0598	0.208*	-0.125	0.101	0.0545	0.0837	0.467***	0.118**
	(0.127)	(0.108)	(0.107)	(0.110)	(0.104)	(0.118)	(0.0584)	(0.0904)	(0.136)	(0.0475)
Hisp	0.345***	0.251**	0.283**	0.217*	0.153	0.247**	0.138**	0.214**	0.375**	0.0826*
	(0.132)	(0.106)	(0.111)	(0.113)	(0.111)	(0.121)	(0.0631)	(0.0973)	(0.147)	(0.0497)
No HS	0.0343	0.0470	-0.116	-0.0626	-0.342*	-0.0221	-0.0774	-0.120	0.0174	0.113
	(0.222)	(0.181)	(0.191)	(0.197)	(0.184)	(0.208)	(0.106)	(0.164)	(0.241)	(0.0817)
HS degree	-0.108	0.0229	-0.175	-0.0922	-0.274***	-0.0616	-0.0750	-0.115	-0.163	-0.0283
	(0.119)	(0.110)	(0.109)	(0.110)	(0.102)	(0.127)	(0.0623)	(0.0966)	(0.133)	(0.0473)
Some college	-0.125	-0.0276	-0.194**	-0.123	-0.261***	-0.0655	-0.0875*	-0.133*	-0.0677	-0.0381
	(0.0889)	(0.0848)	(0.0838)	(0.0845)	(0.0773)	(0.103)	(0.0477)	(0.0742)	(0.0992)	(0.0363)
Bachelor	-0.0741	0.00608	-0.0645	-0.0542	-0.118	-0.0119	-0.0333	-0.0503	-0.0170	-0.0123
	(0.0896)	(0.0870)	(0.0845)	(0.0855)	(0.0763)	(0.106)	(0.0480)	(0.0748)	(0.0993)	(0.0369)
<$25,000$	-0.712***	-0.758***	-0.889***	-0.705***	-0.788***	-0.556***	-0.477***	-0.732***	-0.856***	-0.267***
	(0.137)	(0.123)	(0.120)	(0.122)	(0.114)	(0.138)	(0.0690)	(0.107)	(0.148)	(0.0538)
$25,000-$49,999	-0.441***	-0.575***	-0.662***	-0.539***	-0.563***	-0.391***	-0.357***	-0.546***	-0.513***	-0.205***
	(0.102)	(0.0949)	(0.0947)	(0.0920)	(0.0871)	(0.115)	(0.0532)	(0.0829)	(0.110)	(0.0415)
$50,000-$74,999	-0.282***	-0.344***	-0.430***	-0.321***	-0.342***	-0.360***	-0.230***	-0.359***	-0.302***	-0.121***
	(0.0939)	(0.0896)	(0.0896)	(0.0874)	(0.0807)	(0.110)	(0.0504)	(0.0785)	(0.103)	(0.0385)
$75,000-$100,000	0.0277	-0.00422	-0.0976	-0.0557	-0.0781	0.0293	-0.0281	-0.0399	-0.0304	-0.0461
	(0.101)	(0.0980)	(0.0974)	(0.0955)	(0.0881)	(0.126)	(0.0559)	(0.0873)	(0.114)	(0.0422)
Age <25	0.0194	0.275	0.573***	0.420**	0.0773	0.703***	0.256**	0.413**	0.375	0.150
	(0.246)	(0.194)	(0.198)	(0.203)	(0.194)	(0.235)	(0.117)	(0.183)	(0.258)	(0.0956)
Age 25-35	-0.344**	0.0667	0.170	0.00226	-0.247**	0.368**	0.0373	0.0721	-0.193	-0.00475
	(0.136)	(0.128)	(0.130)	(0.123)	(0.124)	(0.148)	(0.0736)	(0.114)	(0.148)	(0.0526)
Age 35-45	-0.406***	0.00912	0.0591	-0.0943	-0.317**	-0.0420	-0.0465	-0.0730	-0.297*	-0.0700
	(0.140)	(0.134)	(0.136)	(0.128)	(0.128)	(0.154)	(0.0762)	(0.118)	(0.158)	(0.0553)
Age 45-55	-0.612***	-0.404***	-0.317**	-0.420***	-0.481***	-0.382***	-0.258***	-0.400***	-0.588***	-0.189***
	(0.131)	(0.125)	(0.126)	(0.121)	(0.117)	(0.141)	(0.0708)	(0.110)	(0.146)	(0.0516)
Age 55-65	-0.273**	-0.0574	-0.0572	-0.0999	-0.147	-0.217*	-0.0687	-0.113	-0.258**	-0.0754*
	(0.108)	(0.105)	(0.107)	(0.0996)	(0.0959)	(0.125)	(0.0595)	(0.0926)	(0.121)	(0.0431)
Unemployed	-0.585***	-0.416***	-0.448***	-0.525***	-0.265*	-0.308**	-0.257***	-0.393***	-0.688***	-0.199***
	(0.167)	(0.141)	(0.137)	(0.146)	(0.142)	(0.148)	(0.0808)	(0.125)	(0.178)	(0.0642)

Retired	0.597***	0.476***	0.511***	0.515***	0.463***	0.563***	0.323***	0.506***	0.670***	0.209***
	(0.108)	(0.105)	(0.106)	(0.0991)	(0.0941)	(0.128)	(0.0594)	(0.0926)	(0.121)	(0.0430)
Disabled	-0.359*	-0.311*	-0.388**	-0.422**	-0.254	-0.0996	-0.199**	-0.298*	-0.311	-0.139*
	(0.215)	(0.170)	(0.164)	(0.186)	(0.181)	(0.180)	(0.0986)	(0.152)	(0.233)	(0.0812)
Other work	0.144	0.152*	0.208**	0.142	0.187**	0.244**	0.118**	0.188**	0.190*	0.0604
	(0.102)	(0.0916)	(0.0914)	(0.0929)	(0.0870)	(0.104)	(0.0520)	(0.0805)	(0.113)	(0.0401)
Self-reported health	-0.702***	-0.573***	-0.658***	-0.593***	-0.389***	-0.461***	-0.348***	-0.535***	-0.786***	-0.266***
	(0.0454)	(0.0386)	(0.0368)	(0.0382)	(0.0364)	(0.0415)	(0.0216)	(0.0335)	(0.0482)	(0.0167)
Children in HH	-0.0915	-0.0914	-0.164**	-0.104	0.0970	-0.0229	-0.0385	-0.0559	-0.0739	-0.0141
	(0.0737)	(0.0663)	(0.0664)	(0.0674)	(0.0640)	(0.0759)	(0.0379)	(0.0588)	(0.0811)	(0.0288)
Constant	9.159***	6.387***	6.789***	6.788***	6.368***	4.879***	1.056***	6.241***	9.106***	3.873***
	(0.204)	(0.185)	(0.179)	(0.178)	(0.172)	(0.215)	(0.103)	(0.160)	(0.222)	(0.0790)
Observations	4,990	4,991	4,984	4,986	4,987	4,987	4,972	4,972	4,991	4,989
R^2	0.215	0.190	0.244	0.216	0.194	0.121	0.248	0.245	0.223	0.194
p-value race	0.00	0.01	0.02	0.01	0.06	0.21	0.03	0.04	0.00	0.00
p-value education	0.65	0.97	0.17	0.68	0.01	0.96	0.43	0.45	0.74	0.30
p-value income	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
p-value age	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
p-value work status	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: Observations are clustered at the individual level. The p-values mentioned in the last rows refer to a test of joint significance of the indicator variables for the categories race, education, income, age, and work status.

Table 13

Testing the Proportionality of Coefficients – Evaluative Measures (p-values)

	Gallup now	Diener factor	Diener average	ONS Satisfaction
Diener factor	0.01			
Diener average	0.01	0.09		
ONS Satisfaction	0.89	0.02	0.02	
SHARE Satisfaction	0.52	0.35	0.32	0.67

* The Null Hypothesis tested hre is $H_0 : \frac{\beta_{1,model1}}{\beta_{1,model2}} = \frac{\beta_{2,model1}}{\beta_{2,model2}} = \frac{\beta_{3,model1}}{\beta_{3,model2}}$, etc. therefore testing the proportionality of coefficients across models.

Table 14

Regression of Experienced Scales on Demographic and SES Variables

	ELSA		Gallup			HWB		
	Troubled/Fatigue	Positive	Troubled	Positive	Fatigue	Troubled	Positive	Fatigue
Male	0.165***	0.0461	-0.0942*	-0.0291	-0.00632	0.133**	0.0503	-0.0230
	(0.0510)	(0.0538)	(0.0507)	(0.0551)	(0.0507)	(0.0545)	(0.0572)	(0.0502)
With partner	0.0443	0.0637	0.0577	-0.102*	-0.0703	0.0814	0.0800	-0.177***
	(0.0590)	(0.0605)	(0.0566)	(0.0615)	(0.0560)	(0.0617)	(0.0644)	(0.0579)
Other	-0.0279	0.0231	-0.0937	0.0753	-0.0239	-0.183	-0.132	0.0510
	(0.142)	(0.155)	(0.138)	(0.159)	(0.138)	(0.129)	(0.184)	(0.138)
Black	-0.157	0.220**	0.169**	-0.192*	0.174**	-0.0976	-0.119	-0.0840
	(0.103)	(0.0883)	(0.0849)	(0.100)	(0.0867)	(0.120)	(0.104)	(0.106)
Hisp	0.0933	0.344***	-0.342***	-0.266***	0.116	0.118	0.116	0.236**
	(0.0930)	(0.0866)	(0.109)	(0.100)	(0.0991)	(0.101)	(0.0964)	(0.113)
No HS	-0.0514	-0.248	0.0465	0.228	-0.0962	-0.397**	-0.357**	0.505**
	(0.189)	(0.181)	(0.184)	(0.178)	(0.144)	(0.175)	(0.162)	(0.196)
HS degree	-0.113	-0.0844	0.0180	0.200**	-0.161*	-0.422***	-0.225**	0.159*
	(0.0854)	(0.0918)	(0.0876)	(0.0939)	(0.0921)	(0.0935)	(0.0941)	(0.0869)
Some college	-0.00783	0.0741	0.0439	0.0682	-0.0978	-0.248***	-0.176**	0.126*
	(0.0675)	(0.0739)	(0.0657)	(0.0741)	(0.0679)	(0.0825)	(0.0792)	(0.0725)
Bachelor	-0.0852	0.0249	-0.00688	-0.00358	-0.0432	-0.152*	-0.00714	-0.0367
	(0.0647)	(0.0720)	(0.0700)	(0.0787)	(0.0730)	(0.0819)	(0.0803)	(0.0746)
<$25,000$	0.0982	-0.0391	-0.0724	0.254**	-0.271***	0.200*	0.0123	-0.0147
	(0.0985)	(0.0997)	(0.100)	(0.109)	(0.100)	(0.105)	(0.112)	(0.0959)
$25,000-$49,999	0.0320	-0.0418	-0.00881	0.0654	-0.202**	0.131	0.00109	-0.0764
	(0.0718)	(0.0792)	(0.0755)	(0.0835)	(0.0794)	(0.0839)	(0.0873)	(0.0784)
$50,000-$74,999	0.000432	-0.0403	-0.0969	0.161*	-0.153**	-0.0166	0.0666	-0.0717
	(0.0698)	(0.0756)	(0.0740)	(0.0840)	(0.0762)	(0.0798)	(0.0840)	(0.0734)
$75,000-$100,000	0.0151	0.0104	-0.0255	0.0658	-0.0753	0.0382	0.0744	-0.0362
	(0.0771)	(0.0819)	(0.0808)	(0.0884)	(0.0809)	(0.0923)	(0.0909)	(0.0771)
Age <25	0.332**	-0.0750	-0.299*	-0.0935	-0.153	0.00708	-0.182	0.228
	(0.167)	(0.189)	(0.177)	(0.178)	(0.197)	(0.183)	(0.199)	(0.186)
Age 25-35	0.395***	0.0934	-0.186*	0.148	-0.143	0.312***	-0.126	0.273***
	(0.100)	(0.118)	(0.104)	(0.107)	(0.102)	(0.115)	(0.122)	(0.104)
Age 35-45	0.292***	-0.0306	-0.183*	0.142	-0.0168	0.183*	-0.188	0.0422
	(0.102)	(0.122)	(0.102)	(0.111)	(0.104)	(0.110)	(0.124)	(0.0993)
Age 45-55	0.351***	-0.0330	-0.103	0.178*	-0.124	0.234**	-0.345***	0.0294
	(0.0917)	(0.112)	(0.0940)	(0.102)	(0.0939)	(0.102)	(0.110)	(0.0920)
Age 55-65	0.232***	0.142	-0.130*	0.0775	-0.0401	0.0426	-0.134	0.160**
	(0.0757)	(0.0995)	(0.0786)	(0.0878)	(0.0845)	(0.0848)	(0.0991)	(0.0793)
Unemployed	-0.0881	-0.0322	-0.325***	0.163	-0.00634	0.173	-0.0518	0.0694
	(0.123)	(0.109)	(0.116)	(0.126)	(0.120)	(0.125)	(0.121)	(0.120)
Retired	-0.133*	0.288***	0.218***	-0.000484	-0.105	-0.233***	0.0665	0.120
	(0.0751)	(0.0993)	(0.0792)	(0.0917)	(0.0878)	(0.0895)	(0.0991)	(0.0828)

Disabled	0.376**	-0.0250	-0.153	-0.00966	-0.340***	0.0833	-0.0408	0.543***
	(0.180)	(0.132)	(0.158)	(0.143)	(0.132)	(0.138)	(0.136)	(0.158)
Other work	0.0223	0.175**	-0.0257	-0.0552	-0.0152	0.0421	0.0794	-0.0245
	(0.0807)	(0.0795)	(0.0738)	(0.0761)	(0.0707)	(0.0856)	(0.0877)	(0.0823)
Self-reported health	0.231***	-0.206***	-0.135***	0.196***	-0.286***	0.163***	-0.180***	0.179***
	(0.0299)	(0.0340)	(0.0310)	(0.0314)	(0.0312)	(0.0330)	(0.0338)	(0.0341)
Children in HH	0.0417	0.0457	-0.0137	0.0802	0.0132	0.0570	0.0808	-0.00810
	(0.0545)	(0.0572)	(0.0559)	(0.0591)	(0.0544)	(0.0594)	(0.0595)	(0.0540)
Constant	-1.153***	0.237	0.659***	-0.645***	1.146***	-0.701***	0.540***	-0.576***
	(0.150)	(0.162)	(0.146)	(0.152)	(0.136)	(0.161)	(0.166)	(0.157)
Observations	1,671	1,671	1,681	1,681	1,681	1,598	1,598	1,598
R^2	0.118	0.080	0.072	0.067	0.128	0.086	0.070	0.112
p-value race	0.28	0.00	0.00	0.02	0.17	0.22	0.30	0.14
p-value education	0.43	0.14	0.94	0.14	0.45	0.00	0.01	0.01
p-value income	0.87	0.96	0.64	0.10	0.07	0.12	0.83	0.81
p-value age	0.00	0.09	0.33	0.40	0.46	0.02	0.02	0.01
p-value work status	0.05	0.01	0.00	0.62	0.09	0.02	0.81	0.01

Notes: Observations are clustered at the individual level. The p-values mentioned in the last rows refer to a test of joint significance of the indicator variables for the categories race, education, income, age, and work status.

Table 15

Testing the Proportionality of Coefficients – Experienced Measures (p-values)

	ELSA Troubled/Fatigue	ELSA Positive	Gallup Troubled	Gallup Positive	Gallup Fatigue	HWB12 Troubled	HWB12 Positive
ELSA Positive	0.02						
Gallup Troubled	0.47	0.04					
Gallup Positive	0.20	0.77	0.88				
Gallup Fatigue	0.85	0.97	0.96	0.99			
HWB12 Troubled	0.43	0.02	0.66	0.04	0.01		
HWB12 Positive	0.16	0.59	0.79	0.92	0.22	0.04	
HWB12 Fatigue	0.19	0.33	0.82	0.67	0.09	0.19	0.89

* The Null Hypothesis tested here is $H_0 : \frac{\beta_{1model1}}{\beta_{1model2}} = \frac{\beta_{2model1}}{\beta_{2model2}} = \frac{\beta_{3model1}}{\beta_{3model2}}$, etc. therefore testing the proportionality of coefficients across model.

Appendix B: Questionnaires

Evaluative questions

The Cantril Ladder - Gallup Well-Being Index

Please imagine a ladder with steps numbered from 0 at the bottom to 10 at the top. Suppose we say that 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, assuming that the higher the step the better you feel about your life, and the lower the step the worse you feel about it? **Which step comes closest to the way you feel**?

1	2	3	4	5	6	7	8	9	10
□	□	□	□	□	□	□	□	□	□

Please imagine a ladder with steps numbered from 0 at the bottom to 10 at the top. Suppose we say that 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 stood **5 years ago**?

1	2	3	4	5	6	7	8	9	10
□	□	□	□	□	□	□	□	□	□

Please imagine a ladder with steps numbered from 0 at the bottom to 10 at the top. Suppose we say that 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 will stand on in the future, say about **5 years from now**?

1	2	3	4	5	6	7	8	9	10

□ □ □ □ □ □ □ □ □ □

Diener's life satisfaction – HRS/ELSA

Please say how much you agree or disagree with the following statements. *Mark (X) one box.*

- In most ways my life is close to ideal. *Mark (X) one box.*

1	2	3	4	5	6	7
Strongly disagree	Somewhat disagree	Slightly disagree	Neither agree or disagree	Slightly agree	Somewhat agree	Strongly agree
□	□	□	□	□	□	□

- The conditions of my life are excellent. *Mark (X) one box.*

1	2	3	4	5	6	7
Strongly disagree	Somewhat disagree	Slightly disagree	Neither agree or disagree	Slightly agree	Somewhat agree	Strongly agree
□	□	□	□	□	□	□

- I am satisfied with my life. *Mark (X) one box.*

1	2	3	4	5	6	7
Strongly disagree	Somewhat disagree	Slightly disagree	Neither agree or disagree	Slightly agree	Somewhat agree	Strongly agree
□	□	□	□	□	□	□

- So far, I have gotten the important things I want in life. *Mark (X) one box.*

1	2	3	4	5	6	7
Strongly disagree	Somewhat disagree	Slightly disagree	Neither agree or disagree	Slightly agree	Somewhat agree	Strongly agree
□	□	□	□	□	□	□

- If I could live my life again, I would change almost nothing. *Mark (X) one box.*

1	2	3	4	5	6	7
Strongly disagree	Somewhat disagree	Slightly disagree	Neither agree or disagree	Slightly agree	Somewhat agree	Strongly agree
□	□	□	□	□	□	□

Life satisfaction - SHARE

How satisfied are you with your life in general?

1	2	3	4
Very satisfied	Somewhat satisfied	Somewhat dissatisfied	Very dissatisfied
□	□	□	□

ONS – ELSA

- Overall, how **satisfied** are you with your life nowadays?

Not at all										Completely
0	1	2	3	4	5	6	7	8	9	10
□	□	□	□	□	□	□	□	□	□	□

- Overall, how **happy** did you feel yesterday?

Not at all										Completely
0	1	2	3	4	5	6	7	8	9	10
□	□	□	□	□	□	□	□	□	□	□

- Overall, how **anxious** did you feel yesterday?

Not at all										Completely
0	1	2	3	4	5	6	7	8	9	10
□	□	□	□	□	□	□	□	□	□	□

- Overall, to what extent do you feel that the things you do in your life are **worthwhile**?

Not at all										Completely
0	1	2	3	4	5	6	7	8	9	10
□	□	□	□	□	□	□	□	□	□	□

Experienced Questions – ELSA

ELSA (Questions 37/38, 49-68):

Intro: Now, please pause briefly to think about **yesterday**, from the morning until the end of the day. Think about where you were, what you were doing, who you were with, and how you felt.

- What day of the week was it **yesterday**? *Tick one box.*

□Monday
□Tuesday
□Wednesday
□Thursday
□Friday
□Saturday
□Sunday

- What time did you wake up **yesterday**? For example, if you woke up at 4:00 AM, pleased write 04 in the hour boxes, 00 in the minutes boxes, and AM in the last boxes

Hours | | | Minutes | | | AM or PM | | |

- What time did you go to sleep at the end of the day **yesterday**? For example if you went to sleep at 11:30 PM, please write 11 in the hour boxes, 30 in the minutes boxes, and PM in the last boxes.

Hours | | | Minutes | | | AM or PM | | |

- Yesterday, did you feel any **pain**?

None □
A little □
Some □

Quite a bit □

A lot □

- Did you feel well-rested **yesterday morning** (that is, you slept well the night before)?

  Yes □ No □

- Was **yesterday** a normal day for you or did something unusual happen? *Tick one box.*

  Yes – just a normal day □

  No, my day included unusual bad (stressful) things □

  No, my day included unusual good things □

Intro: Please think about the **things you did yesterday**. How did you spend your time and how did you feel?

- Yesterday, did you **watch TV**? *Tick one box.*

  Yes □

  No □ **(skip next 2 questions)**

- How much time did you spend **watching TV yesterday**? *For example, if you spent one and a half hours, write 1 in the hours box and 30 in the minutes boxes.*

Hours ☐ Minutes ☐

- How did you feel when you were **watching TV yesterday**? Rate each feeling on a scale from 0 – did not experience at all – to 6 – the feeling was extremely strong. *Tick <u>one</u> box on each line*

Did not experience the feeling at all						Feeling was extremely strong
0	1	2	3	4	5	6

I felt:	Happy	□	□	□	□	□	□	□
	Interested	□	□	□	□	□	□	□
	Frustrated	□	□	□	□	□	□	□
	Sad	□	□	□	□	□	□	□

- Yesterday, did you **work or volunteer**? *Tick one box.*

  Yes □

  No □ **(skip next 2 questions)**

- How much time did you spend **working or volunteering yesterday**? *For example, if you spent nine and a half hours, write 9 in the hours box and 30 in the minutes box.*

Hours ☐ Minutes ☐

- How did you feel when you were **working or volunteering yesterday**? Rate each feeling on a scale from 0 – did not experience at all – to 6 – the feeling was extremely strong. *Tick <u>one</u> box on each line*

		Did not experience the feeling at all						Feeling was extremely strong
		0	1	2	3	4	5	6
I felt:	Happy	□	□	□	□	□	□	□
	Interested	□	□	□	□	□	□	□
	Frustrated	□	□	□	□	□	□	□
	Sad	□	□	□	□	□	□	□

- Yesterday, did you go for a **walk or exercise**? *Tick one box.*

  Yes □

  No □ **(skip next 2 questions)**

- How much time did you spend **walking or exercising yesterday**? *For example, if you spent 30 minutes, write 0 in the hours box, and 30 in the minutes box.*

Hours ☐ Minutes ☐

- How did you feel when you were **walking or exercising yesterday**? Rate each feeling on a scale from 0 – did not experience at all – to 6 – the feeling was extremely strong. *Tick <u>one</u> box on each line*

		Did not experience the feeling at all						Feeling was extremely strong
		0	1	2	3	4	5	6
I felt:	Happy	□	□	□	□	□	□	□
	Interested	□	□	□	□	□	□	□
	Frustrated	□	□	□	□	□	□	□
	Sad	□	□	□	□	□	□	□

- Yesterday did you do any **health-related activities other than walking or exercise**? For example, visiting a doctor, taking medications or doing treatments. *Tick one box.*

  Yes □

  No □ **(skip next 2 questions)**

- How much time did you spend doing **health-related activities yesterday**?

Hours ☐ Minutes ☐

- How did you feel when you were **doing health-related activities yesterday**? Rate each feeling on a scale from 0 – did not experience at all – to 6 – the feeling was extremely strong. *Tick <u>one</u> box on each line*

		Did not experience the feeling at all						Feeling was extremely strong
		0	1	2	3	4	5	6
I felt:	Happy	☐	☐	☐	☐	☐	☐	☐
	Interested	☐	☐	☐	☐	☐	☐	☐
	Frustrated	☐	☐	☐	☐	☐	☐	☐
	Sad	☐	☐	☐	☐	☐	☐	☐

- Yesterday did you **travel or commute**? E.g. by car, train, bus etc. *Tick one box.*

  Yes ☐

  No ☐**(skip next 2 questions)**

- How much time did spend **travelling or commuting yesterday?**

Hours ☐ Minutes ☐

- How did you feel when you were **travelling or commuting yesterday**? Rate each feeling on a scale from 0 – did not experience at all – to 6 – the feeling was extremely strong. *Tick <u>one</u> box on each line*

		Did not experience the feeling						Feeling was extremely

		at all						strong
		0	1	2	3	4	5	6
I felt:	Happy	□	□	□	□	□	□	□
	Interested	□	□	□	□	□	□	□
	Frustrated	□	□	□	□	□	□	□
	Sad	□	□	□	□	□	□	□

- Yesterday did you **spend time with friends or family**? *Tick one box.*

  Yes □

  No □ **(skip next 2 questions)**

- How much time did you spend **with friends or family yesterday?**

Hours ☐ Minutes ☐

- How did you feel when you were **with friends or family yesterday**? Rate each feeling on a scale from 0 – did not experience at all – to 6 – the feeling was extremely strong. *Tick <u>one</u> box on each line*

		Did not experience the feeling at all						Feeling was extremely strong
		0	1	2	3	4	5	6
I felt:	Happy	□	□	□	□	□	□	□
	Interested	□	□	□	□	□	□	□
	Frustrated	□	□	□	□	□	□	□

	Sad	□	□	□	□	□	□	□

- Yesterday did you **spend time at home by yourself**? Without a spouse, partner or anyone else present. *Tick one box.*

  Yes □

  No □ **(skip next 2 questions)**

- How much time did you **spend at home by yourself yesterday?**

Hours ☐ Minutes ☐

- How did you feel when you were **at home by yourself yesterday**? Rate each feeling on a scale from 0 – did not experience at all – to 6 – the feeling was extremely strong. *Tick <u>one</u> box on each line*

		Did not experience the feeling at all						Feeling was extremely strong
		0	1	2	3	4	5	6
I felt:	Happy	□	□	□	□	□	□	□
	Interested	□	□	□	□	□	□	□
	Frustrated	□	□	□	□	□	□	□
	Sad	□	□	□	□	□	□	□

Additional module:

Overall, how did you feel **yesterday**? Rate each feeling on a scale from 0 – did not experience at all – to 6 – the feeling was extremely strong. *Tick <u>one</u> box on each line*

	Did not experience the feeling at all						Feeling was extremely strong
	0	1	2	3	4	5	6
Happy	□	□	□	□	□	□	□
Interested	□	□	□	□	□	□	□
Frustrated	□	□	□	□	□	□	□
Sad	□	□	□	□	□	□	□
Enthusiastic	□	□	□	□	□	□	□
Content	□	□	□	□	□	□	□
Angry	□	□	□	□	□	□	□
Tired	□	□	□	□	□	□	□
Stressed	□	□	□	□	□	□	□
Lonely	□	□	□	□	□	□	□
Worried	□	□	□	□	□	□	□
Bored	□	□	□	□	□	□	□
Pain	□	□	□	□	□	□	□
Depressed	□	□	□	□	□	□	□
Joyful	□	□	□	□	□	□	□

Experienced Questions – GALLUP

Gallup Well-Being Index

Did you experience **anger** during a lot of the day yesterday?

□Yes

□No

Did you experience **depression** during a lot of the day yesterday?

□Yes

□No

Did you experience **enjoyment** during a lot of the day yesterday?

□Yes

□No

Did you experience **happiness** during a lot of the day yesterday?

□Yes

□No

Did you experience **sadness** during a lot of the day yesterday?

□Yes

□No

Did you experience **stress** during a lot of the day yesterday?

□Yes

□No

Did you experience **worry** during a lot of the day yesterday?

□Yes

□No

Now, please think about yesterday, from the morning until the end of the day. Think about where you were, what you were doing, who you were with, and how you felt. **Did you learn or do something interesting yesterday**?

□Yes

□No

Now, please think about yesterday, from the morning until the end of the day. Think about where you were, what you were doing, who you were with, and how you felt. **Did you smile or laugh a lot yesterday**?

□Yes

□No

Now, please think about yesterday, from the morning until the end of the day. Think about where you were, what you were doing, who you were with, and how you felt. **Were you treated with respect all day yesterday**?

□Yes
□No

Now, please think about yesterday, from the morning until the end of the day. Think about where you were, what you were doing, who you were with, and how you felt. **Would you like to have more days just like yesterday**?

□Yes
□No

Additional module

Did you experience **enthusiasm** during a lot of the day yesterday?
□Yes
□No

Did you experience **contentment** during a lot of the day yesterday?
□Yes
□No

Did you experience **frustration** during a lot of the day yesterday?
□Yes
□No

Did you experience **fatigue** during a lot of the day yesterday?
□Yes
□No

Did you experience **loneliness** during a lot of the day yesterday?
□Yes

□No

Did you experience **boredom** during a lot of the day yesterday?

□Yes

□No

Did you experience **pain** during a lot of the day yesterday?

□Yes

□No

What time did you wake up **yesterday**? …..:……

What time did you go to bed **yesterday**? …..:……

Did you feel well-rested **yesterday morning** (that is, you slept well the night before)? *Tick one box.*

Yes □

No □

Was yesterday a normal day for you or did something unusual happen?

□Yes – just a normal day

□No , my day included unusual bad (stressful) things

□ No, my day included unusual good things

Intro: Please think about the **things you did yesterday**. How did you spend your time and how did you feel?

- Yesterday, did you **watch TV**? *Tick one box.*

  Yes □

  No □ (skip next question)

- How much time did you spend **watching TV yesterday**? *For example, if you spent one and a half hours, write 1 in the hours box and 30 in the minutes boxes.*

Hours ☐ Minutes ☐

- Yesterday, did you **work or volunteer**? *Tick one box.*

  Yes □

  No □ **(skip next question)**

- How much time did you spend **working or volunteering yesterday**? *For example, if you spent nine and a half hours, write 9 in the hours box and 30 in the minutes box.*

Hours ☐ Minutes ☐

- Yesterday, did you go for a **walk or exercise**? *Tick one box.*

  Yes □

  No □ **(skip next question)**

- How much time did you spend **walking or exercising yesterday**? *For example, if you spent 30 minutes, write 0 in the hours box, and 30 in the minutes box.*

Hours ☐ Minutes ☐

- Yesterday did you do any **health-related activities other than walking or exercise**? For example, visiting a doctor, taking medications or doing treatments. *Tick one box.*

  Yes □

  No □ **(skip next question)**

- How much time did you spend doing **health-related activities yesterday**?

Hours ☐ Minutes ☐

- Yesterday did you **travel or commute**? E.g. by car, train, bus etc. *Tick one box.*

  Yes □

  No □ **(skip next question)**

- How much time did spend **travelling or commuting yesterday?**

Hours ☐ Minutes ☐

- Yesterday did you **spend time with friends or family**? *Tick one box.*

  Yes □

  No □ **(skip next question)**

- How much time did you spend **with friends or family yesterday?**

Hours ☐ Minutes ☐

- Yesterday did you **spend time at home by yourself**? Without a spouse, partner or anyone else present. *Tick one box.*

  Yes □

  No □ **(skip next question)**

- How much time did you **spend at home by yourself yesterday?**

Hours ☐ Minutes ☐

How did you feel when you were **walking or exercising**? Rate each feeling on a scale from 0 – did not experience at all – to 6 – the feeling was extremely strong.

Tick <u>one</u> box on each line

		Did not experience the feeling at all						Feeling was extremel strong
		0	1	2	3	4	5	6
I felt:	Happy	□	□	□	□	□	□	□
	Interested	□	□	□	□	□	□	□
	Frustrated	□	□	□	□	□	□	□
	Sad	□	□	□	□	□	□	□

Experienced Questionnaire – HWB-12

HWB-12 (Smith & Stone)

Now we would like you to think about yesterday. What did you do yesterday and how did you feel?

To begin, please tell me what time you woke up **yesterday**: ……..

And what time did you go to sleep **yesterday**? ……..

Now please take a few quiet seconds to recall your activities and experiences *yesterday* ***[computer-programmed max 10 seconds delay].***

Good, now I have questions about your experiences **yesterday**.

[Randomize order of emotions]

- Yesterday, did you feel **happy**? Would you say:

Not at all	A little	Somewhat	Quite a bit	Very
□	□	□	□	□

- Yesterday, did you feel **enthusiastic**? Would you say:

Not at all	A little	Somewhat	Quite a bit	Very
□	□	□	□	□

- Yesterday, did you feel **content**? Would you say:

Not at all	A little	Somewhat	Quite a bit	Very
□	□	□	□	□

- Yesterday, did you feel **angry**? Would you say:

Not at all	A little	Somewhat	Quite a bit	Very
□	□	□	□	□

- Yesterday, did you feel **frustrated**? Would you say:

Not at all	A little	Somewhat	Quite a bit	Very
□	□	□	□	□

- Yesterday, did you feel **tired**? Would you say:

Not at all	A little	Somewhat	Quite a bit	Very
□	□	□	□	□

- Yesterday, did you feel **sad**? Would you say:

Not at all	A little	Somewhat	Quite a bit	Very
□	□	□	□	□

- Yesterday, did you feel **stressed**? Would you say:

Not at all	A little	Somewhat	Quite a bit	Very
□	□	□	□	□

- Yesterday, did you feel **lonely**? Would you say:

Not at all	A little	Somewhat	Quite a bit	Very
□	□	□	□	□

- Yesterday, did you feel **worried**? Would you say:

Not at all	A little	Somewhat	Quite a bit	Very
□	□	□	□	□

- Yesterday, did you feel **bored**? Would you say:

Not at all	A little	Somewhat	Quite a bit	Very
□	□	□	□	□

- Yesterday, did you feel **pain**? Would you say:

Not at all	A little	Somewhat	Quite a bit	Very
□	□	□	□	□

Additional module

[Randomize order of emotions]

- Yesterday, did you feel **depressed**? Would you say:

Not at all	A little	Somewhat	Quite a bit	Very
□	□	□	□	□

- Yesterday, did you feel **joyful**? Would you say:

Not at all	A little	Somewhat	Quite a bit	Very
□	□	□	□	□

- Yesterday, did you **learn or do something interesting**? Would you say:

Not at all	A little	Somewhat	Quite a bit	Very
□	□	□	□	□

- Did you feel well-rested **yesterday morning** (that is, you slept well the night before)?

  Yes □ No □

- Was **yesterday** a normal day for you or did something unusual happen? *Tick one box.*

  Yes – just a normal day □

  No, my day included unusual bad (stressful) things □

  No, my day included unusual good things □

Intro: Please think about the **things you did yesterday**. How did you spend your time and how did you feel?

- Yesterday, did you **watch TV**? *Tick one box.*

  Yes □

  No □ **(skip next question)**

- How much time did you spend **watching TV yesterday**? *For example, if you spent one and a half hours, write 1 in the hours box and 30 in the minutes boxes.*

Hours ☐ Minutes ☐

- Yesterday, did you **work or volunteer**? *Tick one box.*

  Yes □

  No □ **(skip next question)**

- How much time did you spend **working or volunteering yesterday**? *For example, if you spent nine and a half hours, write 9 in the hours box and 30 in the minutes box.*

Hours ☐ Minutes ☐

- Yesterday, did you go for a **walk or exercise**? *Tick one box.*

  Yes □

  No □ **(skip next question)**

- How much time did you spend **walking or exercising yesterday**? *For example, if you spent 30 minutes, write 0 in the hours box, and 30 in the minutes box.*

Hours ☐ Minutes ☐

- Yesterday did you do any **health-related activities other than walking or exercise**? For example, visiting a doctor, taking medications or doing treatments. *Tick one box.*

  Yes □

  No □ **(skip next question)**

- How much time did you spend doing **health-related activities yesterday**?

Hours ☐ Minutes ☐

- Yesterday did you **travel or commute**? E.g. by car, train, bus etc. *Tick one box.*

  Yes □

  No □ **(skip next question)**

- How much time did spend **travelling or commuting yesterday?**

Hours ☐ Minutes ☐

- Yesterday did you **spend time with friends or family**? *Tick one box.*

  Yes □

  No □ **(skip next question)**

- How much time did you spend **with friends or family yesterday?**

Hours ☐ Minutes ☐

- Yesterday did you **spend time at home by yourself**? Without a spouse, partner or anyone else present. *Tick one box.*

  Yes □

  No □ **(skip next question)**

- How much time did you **spend at home by yourself yesterday?**

Hours ☐ Minutes ☐

How did you feel when you were **walking or exercising**? Rate each feeling on a scale from 0 – did not experience at all – to 6 – the feeling was extremely strong.

Tick <u>one</u> box on each line

		Did not experience the feeling at all						Feeling was extremel strong
		0	1	2	3	4	5	6
I felt:	Happy	□	□	□	□	□	□	□
	Interested	□	□	□	□	□	□	□
	Frustrated	□	□	□	□	□	□	□
	Sad	□	□	□	□	□	□	□

Appendix C: Proportion of activities reported

	ELSA - Work days			
	Baseline	Follow-up	P-value	Diff
Watching TV	0.79	0.78	0.91	0.00
Working	0.54	0.48	0.02	0.06
Exercising	0.47	0.47	0.92	0.00
Health related activities	0.39	0.34	0.05	0.06
Traveling or commuting	0.71	0.66	0.15	0.04
Family and friends	0.78	0.77	0.62	0.01
Home	0.50	0.53	0.44	-0.03
Total number of activities reported	4.17	4.03	0.06	0.15

	ELSA - Weekends			
	Baseline	Follow-up	P-value	Diff
Watching TV	0.86	0.86	1.00	0.00
Working	0.14	0.21	0.34	-0.07
Exercising	0.36	0.57	0.19	-0.21
Health related activities	0.14	0.00	0.16	0.14
Traveling or commuting	0.50	0.64	0.16	-0.14
Family and friends	0.86	0.86	1.00	0.00
Home	0.50	0.29	0.08	0.21
Total number of activities reported	3.36	3.43	0.78	-0.07