



**European Bank**  
for Reconstruction and Development

# **How much should we trust life satisfaction data? Evidence from the Life in Transition Survey**

Elena Nikolova and Peter Sanfey

## **Summary**

We analyse responses to two similar life satisfaction questions asked during the same interview for each respondent in a major cross-country household survey covering the transition region, Turkey and five western European countries. We show that while the answers to the two questions are broadly consistent for most people, the responses for some groups differ significantly. Older and less healthy respondents show systematically lower levels of self-reported satisfaction in the later question, as do those living under less democratic, more repressive regimes. We also find evidence that responses to the later question are influenced by preceding questions on socio-economic status and social capital, and that response precision depends on the interviewee's socio-economic status. Our results have important implications for the design and length of household surveys that contain subjective questions.

*Keywords:* life satisfaction, measurement, Life in Transition Survey.

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*Contact details:* Elena Nikolova, One Exchange Square, London EC2A 2JN, United Kingdom  
*Phone:* +44 20 7338 7931; *Fax:* +44 20 7338 6110; *email:* nikolove@ebrd.com.

Elena Nikolova is Research Economist at the European Bank for Reconstruction and Development. Peter Sanfey is Deputy Director of Country Strategy and Policy at the European Bank for Reconstruction and Development.

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# 1 Introduction

In the past two decades, the study of life satisfaction, or “happiness”, has become a thriving area of research in economics. There is now a firm body of evidence to support the view that surveys of well-being can yield meaningful and policy-relevant information about people’s welfare. Increasingly, this research has spilled over into the policy arena, with institutions such as the OECD routinely constructing cross-country measures of happiness and producing guidelines on the appropriate methodology.<sup>1</sup> But what happens when people are asked twice in the same interview about their well-being? Are the responses consistent or do they differ for some people, and if so, how? These questions, which have received little attention in the literature so far, are the focus of our paper.

Our analysis is based on the second round of the EBRD/World Bank Life in Transition Survey (LiTS II), a nationally representative household-level survey. LiTS II was carried out in late 2010 across 29 transition countries of central and eastern Europe and the former Soviet Union, Turkey and five western European countries (France, Germany, Italy, Sweden and the United Kingdom). A unique feature of this survey is that respondents are asked about their overall satisfaction with life at different points in the same interview, which allows us to study how intervening questions change the interviewee’s initial life satisfaction answer. The first subjective well-being question, which asks respondents to agree or disagree with the statement “*All things considered, I am satisfied with my life now*” (on a five-point scale), appears relatively early in the interview. In contrast, the second question, phrased as follows: “*All things considered, how satisfied or dissatisfied are you with your life as a whole these days? Please answer on a scale of 1 to 10, where 1 means completely dissatisfied and 10 means completely satisfied*”, is near the end of the questionnaire. While the questions are quite similar, there are differences when it comes to phrasing and scaling which may also drive the observed variation in responses.

Cojocaru and Diagne (2013) have looked at the consistency of the two measures and show that the answers are highly correlated at the country level. Although our individual-level analysis is broadly in line with such a conclusion, we also find that for approximately 14 per cent of respondents the answers to the two life satisfaction questions differ significantly.<sup>2</sup> In our analysis, we test four specific hypotheses related to (1) the *direction* of the response switch (captured by the actual response difference) and (2) the *precision* of the two responses (proxied by the absolute value of the response difference).

- Responses to life satisfaction questions may be significantly affected by an individual’s mood, which can change markedly during the interview. The LiTS questionnaire is lengthy, with interviews typically lasting more than an hour. Therefore, an apparent drop in life satisfaction between the first and second question could be related to age and health, as older and less healthy people become tired and fed up as the interview progresses.

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<sup>1</sup>Life satisfaction is a key component of the OECD’s “Better Life Initiative”, described in <http://www.oecd.org/statistics/measuring-well-being-and-progress.htm>. The United Nations produces an annual report on world happiness - see Helliwell et al. (2013).

<sup>2</sup>We explain below what we mean by a “significant” difference between the two responses.

- The responses may be affected by context and framing effects. Some of the questions and topics addressed between the first and second life satisfaction question may prompt respondents to evaluate good or bad aspects of their lives. We explore the extent to which answers to the second question appear to be influenced by socio-economic status, social capital, views on issues such as trust and corruption, and events from the past.
- Differences in wording of the two questions may be important. Specifically, we test whether in less democratic countries people who are invited to agree with a statement (the format of the first subjective well-being question) may be more inclined to give positive answers than when they are asked to score their response on a numerical scale (which is what they are asked to do in the second question).
- In addition to leading to a downward bias in self-reported well-being in the second question, certain intervening questions and individual characteristics may affect the recall of previous information and thus the measurement error in responses.

We find that several groups of people report a decrease in life satisfaction in the second question. Those aged 63 and above and people who report themselves to be less healthy (on a 1-5 scale) appear on average to experience a drop in life satisfaction during the interview. Higher education (both individual and parental), income and social capital have a positive effect on responses to the second well-being question, though favourable opinions about institutions are either insignificant or, surprisingly, seem to bias life satisfaction scores downward in the second question. Respondents in countries with notoriously weak democratic institutions, such as Tajikistan and Uzbekistan, are more willing to “agree” that they are satisfied with life (in the first question) than they are to give a corresponding high score on a 1-10 scale (in the second question). Lastly, our results suggest that response precision is positively associated with individual socio-economic status (captured by controls for education, income and employment status).

Since our regressions are based on cross-sectional data, a potential concern is that the results may be driven by unobservable individual traits (Ferrer-i Carbonell and Frijters, 2004). We adopt four complementary approaches to deal with such issues. First, by construction, our dependent variable (the response difference to the two life satisfaction questions) eliminates individual-specific effects, which may otherwise have contaminated the estimates. Second, we control for a rich set of observable individual characteristics, ranging from health and marital status to political party membership. Third, we also include country dummies (in the baseline specification) as well as dummies at the levels of sub-national administrative regions and even primary sampling units (PSUs) (in the robustness checks). By comparing similar individuals within very narrow geographical areas, our empirical analysis makes it less likely that the observed effects are driven by fixed sub-national differences such as geography or culture. Finally, it is reassuring that our results survive multiple robustness checks, such as the inclusion of interviewer fixed effects or alternative estimation techniques. Although we cannot eliminate all sources of bias in our cross-sectional data, our multi-pronged, micro-level approach makes us more confident that the relationships which we uncover are likely to be causal.

We contribute to the literature in several ways. First, the unique research set-up implemented in this paper provides us with the rare opportunity to identify the biases associated with data on

subjective well-being. More substantively, we complement a small but increasingly important literature which looks at how answers to life satisfaction questions vary with survey characteristics ranging from order effects and the type of preceding questions to the accessibility and motivation of respondents.<sup>3</sup> While this work is largely based on surveys from single advanced countries, we show that similar concerns about life satisfaction responses may be applicable in a broader cross-section. In fact, the magnitude as well as source of biases which we uncover are remarkably similar when we compare the transition region with the six non-transition countries in our sample (France, Germany, Italy, Sweden, Turkey, United Kingdom).<sup>4</sup>

Finally, our results have important implications for studies on the economics of happiness. The finding that answers to two different questions on subjective well-being are broadly consistent for most people is comforting as it suggests that such data are not unduly driven by random noise and can in fact capture meaningful variation in life satisfaction. Similarly, our findings that reported happiness changes little once respondents are asked a battery of sensitive political questions are encouraging and stand in contrast to other work on the United States, such as Deaton (2012). However, since life satisfaction responses are subject to non-trivial bias for respondents who are older, less healthy and of lower socio-economic status, researchers should pay particular attention to these groups when conducting econometric analyses. More generally, our results show that a re-think may be needed regarding the design of future rounds of the LiTS (and possibly other major household surveys that include questions on subjective well-being), which we discuss in more detail in the conclusion.

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<sup>3</sup>We review these contributions in more detail in the following section.

<sup>4</sup>Such a comparison involves the caveat that the transition sample is much bigger than the non-transition one.

## 2 Previous literature

While economists have paid increasing attention to studying the determinants of life satisfaction, the literature examining issues of measurement has been slower to develop.<sup>5</sup> To the best of our knowledge, there are no prior studies seeking to examine how reported life satisfaction may vary within the *same* interview in a large cross-country survey such as the LiTS.

At the same time, we build on several influential contributions seeking to understand the possible biases involved in subjective well-being responses.<sup>6</sup> Comparing daily data from the Gallup World Poll in the United States, Deaton (2012) finds that life satisfaction measures are extremely dependent on question ordering. He exploits the fact that in early 2009, Gallup randomly split the sample of respondents, with half of interviewees being asked questions on political preferences prior to the life satisfaction question, while for the other half of respondents the life satisfaction question came first. It turns out that the former set-up reduces substantially self-reported well-being, and that the magnitude of this reduction is in fact much higher than the perceived impact of the Great Recession.<sup>7</sup> In contrast, using an approach that is perhaps closest to ours, Krueger and Schkade (2008) find that two different measures of life satisfaction (a standard survey question and data on affective experience collected using the Day Reconstruction Method two weeks after the interview) have a reasonably high serial correlation (0.6) for a sample of 229 women in the United States. Although this correlation is lower than the reliability ratios for objective measures such as education or income, the authors suggest that it is probably sufficient to yield informative measures in large samples.<sup>8</sup>

Life satisfaction data may be subject to additional biases. Conti and Pudney (2011) show that a seemingly minor change in the job satisfaction question in the British Household Panel Survey (BHPS) – the switch from partial use of textual labels (in addition to numerical labels) as anchors for the response scale (in the 1991 survey) to their full use (in the 1992 survey) – leads to large inconsistencies in the distribution of responses. In particular, women are more likely to pick responses accompanied by textual labels. The authors find that survey mode administration (face-to-face or self-administered) and context (presence of partner and children) also matter, more so for women than for men.<sup>9</sup> Interviewer characteristics (including gender and in-

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<sup>5</sup>See Frey and Stutzer (2010), Layard (2005) and Powdthavee (2010) for useful surveys of the literature on the economics of happiness. There is also a small but growing literature on life satisfaction in the transition region (which comprises the majority of our sample), some of which has tried to explain the relatively low levels of happiness compared with other parts of the world (see Sanfey and Teksoz (2007), Guriev and Zhuravskaya (2009), Kornai (2006), Senik (2009) and Dabalén and Paul (2011)).

<sup>6</sup>See Kahneman and Krueger (2006) for an earlier survey of this literature.

<sup>7</sup>In the psychology literature, it has long been recognised that self-reported answers on attitudes and feelings can be affected by context and ordering of questions. See, for example, Schwarz (1999) and Schimmack and Oishi (2005).

<sup>8</sup>See also Studer (2012) who utilises a randomised design in a Dutch internet panel survey to argue that a continuous life satisfaction scale provides more discriminating power than a discrete one.

<sup>9</sup>Dolan and Kavetsos (2012) find that in the 2011 Annual Population Survey in the United Kingdom, respondents who are interviewed over the phone are consistently happier than those in face-to-face interviews, and that the determinants of subjective well-being depend on survey mode. Using multiple waves of the Eurobarometer data, Kavetsos et al. (2014) find that life satisfaction depends on the day and month of the interview (but not time of day), and that subjective well-being is significantly reduced when others are present.

terviewing experience) may also sway life satisfaction responses (Chadi, 2013; Kassenboehmer and Haisken-DeNew, 2012).

Yet another strand of the literature examines to what extent subjective well-being responses vary with interviewees' accessibility and motivation. Using the reported number of call attempts in the University of Michigan's Survey of Consumers, Heffetz and Rabin (2013) show that life-satisfaction levels are higher among easy-to-reach women (compared with easy-to-reach men), but that hard-to-reach men are happier than hard-to-reach women. The authors warn that these unexpected effects of sample selection are likely to be even more severe when fewer contact attempts are made. In a similar vein, Chadi (2014) shows that in the German Socio-Economic Panel Study, respondents with a higher number of interviewer contacts report lower levels of life satisfaction, possibly because such respondents are less motivated to go through with the interview.<sup>10</sup>

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<sup>10</sup>If a selected respondent was unavailable, LiTS enumerators conducted up to three follow-up visits, though unfortunately an exact breakdown for each respondent is not available in our data.

### 3 Data description

Our analysis is based on the second round of the Life in Transition Survey, which covers virtually all transition countries in central and eastern Europe and the former Soviet Union (as well as Mongolia and Turkey), except Turkmenistan.<sup>11</sup> Unlike the first round of the survey, LiTS II also includes five western European “comparator” countries. All of these countries are included in the analysis below, although as we discuss in the robustness section, results are very similar if we only restrict our sample to countries in the transition region.

Respondents were drawn randomly, using a two-stage sampling method with primary and secondary sampling units. The Primary Sampling Units (PSU) are electoral districts, polling station territories, census enumeration districts or geo-administrative divisions, while Secondary Sampling Units are households. Each country has a minimum of 50 PSUs with each PSU containing around 20 households (for a total of approximately 1,000 observations), with the exception of Poland, Russia, Serbia, Ukraine and Uzbekistan, where 75 PSUs containing around 20 households each were drawn (for a total of approximately 1,500 observations). The head of the household or another knowledgeable household member answered the Household Roster and questions about housing and expenses, while all other modules – including the two different life satisfaction question – were answered by a randomly drawn adult (over 18 years of age) from the household in a face-to-face interview with no substitutions possible.<sup>12</sup>

In Section 3, interviewees are asked a series of questions about attitudes and values. The section opens with the respondent being asked: “*To what extent do you agree with the following statements?*” One of the statements is: “*All things considered, I am satisfied with my life now.*” The response could be one of the following: strongly disagree, disagree, neither disagree nor agree, agree, and strongly agree.<sup>13</sup> The answers can be converted to a numerical 1-5 scale, where 1 represents “strongly disagree” and 5 “strongly agree.” Section 7 is entitled “Miscellaneous questions” and covers various aspects of the interviewee’s background and activities. The final question in this section is: “*All things considered, how satisfied or dissatisfied are you with your life as a whole these days? Please answer on a scale of 1 to 10, where 1 means completely dissatisfied and 10 means completely satisfied.*” Showcards were used to present the answer options to the respondent for both questions. The LiTS records information on the duration, date and time of the interview, but inconsistent enforcement means that these data are less reliable (in some cases, our sample also drops significantly). We also obtained information on the identity of the interviewer (captured by an interviewer dummy variable) for all countries except Italy. The results from specifications which control for interview duration and interviewer identity (presented in the online Appendix) are consistent with our baseline findings below.

Charts 1 and 2 show how the scores in these two questions are distributed. The modal response to the first question is “agree” (score of 4), and the simple average of all responses is 3.18. The

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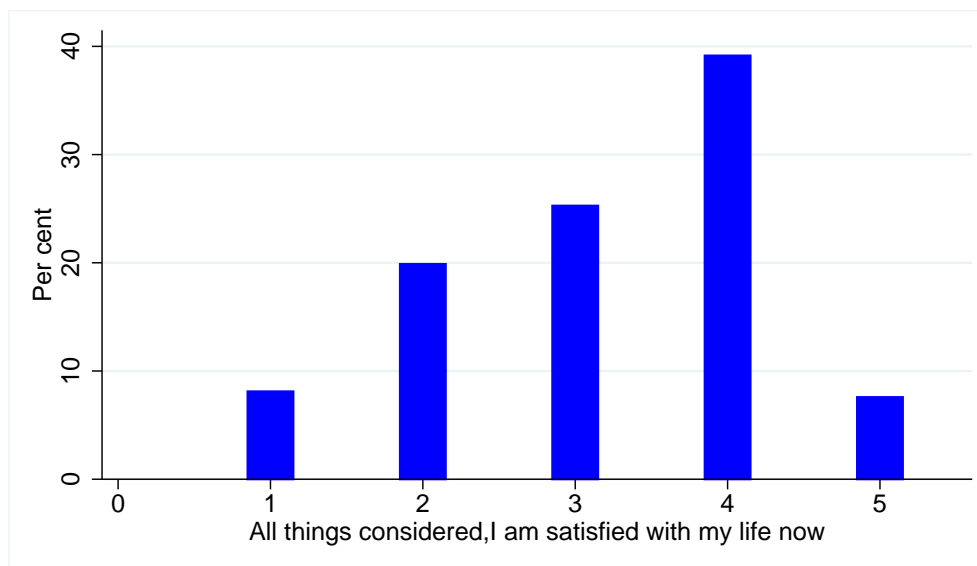
<sup>11</sup>Further details on the Life in Transition Survey, and the full data set, can be accessed at <http://www.ebrd.com/pages/research/economics/data/lits.shtml>.

<sup>12</sup>The other modules are: Attitudes and Values; Climate Change; Labour, Education and Entrepreneurial Activity; Governance, Miscellaneous Questions, and Impact of the Crisis (the latter also answered by the household head).

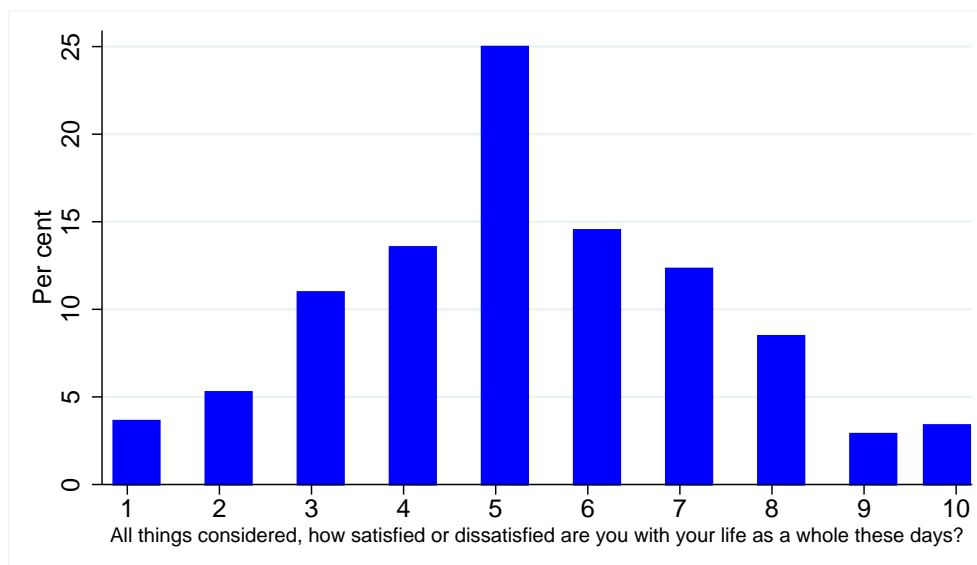
<sup>13</sup>“Do not know” and “not applicable” are also allowed, but these answers are disregarded in this paper.

modal response to the second question is just 5 (on the 1 to 10 scale) with a simple average of 5.52.

**Chart 1:** Distribution of responses – first life satisfaction question



**Chart 2:** Distribution of responses – second life satisfaction question



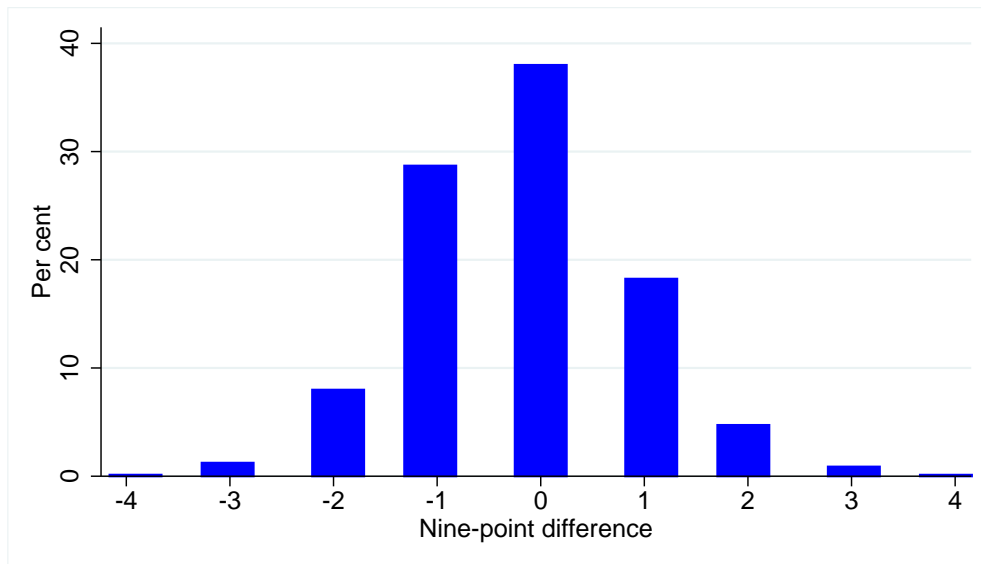


To explore this further, we look at how the responses differ at the individual level. We construct a nine-point index,  $D_1$  as follows: define the first satisfaction question as  $Q_1$  and the second one as  $Q_2$ . Then:

$$D_1 = S_2 - S_1, \tag{1}$$

where  $S_2 = 1$  if the answer to  $Q_2 = 1$  or 2,  $S_2 = 2$  if the answer is 3 or 4, ...,  $S_2 = 5$  if the answer = 9 or 10, and  $S_1 = [1, \dots, 5]$ , as described above.  $D_1$  is therefore on a 9-point scale, ranging from -4 to 4. That is, someone who “strongly agrees” that, all things considered, he/she is satisfied with life now but scores the second question at 1 or 2 would have a  $D_1$  score of -4, whereas “strongly disagree” on the first question, combined with 9 or 10 on the second question would be a  $D_1$  score of 4. Chart 3 shows the distribution of  $D_1$  across the entire sample. Not surprisingly, the modal score is 0 (with a mean of -0.15 and a standard deviation of 1.07), suggesting a relatively high degree of comparability across the two measures of life satisfaction, consistent with the findings of Cojocar and Diagne (2013). However, 14.39 per cent of the sample show a significant deviation in their answers, as captured by scores of 2 and above or -2 and below. The next section tries to explain the variation across individuals by testing econometrically the hypotheses mentioned in the introduction.

**Chart 3:** Histogram of the nine-point difference in responses



## 4 Econometric analysis

We estimate the following equation:

$$D_{1ik} = \alpha_{ik} + \beta_1 \text{AgeDummies}_{ik} + \beta_2 \text{Health}_{ik} + \beta_3 \text{MaritalStatus}_{ik} + X_{ik} \beta_4 + \gamma_k + \varepsilon_{ik}, \quad (2)$$

where for each individual  $i$  in country  $k$   $\text{AgeDummies}_{ik}$  is a set of age dummies (with the cohort aged 42-52 the omitted category),  $\text{Health}_{ik}$  is the respondent's self-assessed health on a scale of 1 (very bad) to 5 (very good), and  $\text{MaritalStatus}_{ik}$  is a dummy variable taking the value of 1 if the respondent is married and 0 otherwise.  $X_{ik}$  is a matrix of additional controls which vary across specifications and include the following broad categories: (1) individual socio-economic characteristics (level of education, income and whether the individual was employed in the past 12 months); (2) parental background (father's education and whether the respondent or his parents/grandparents were injured, killed or displaced during the second world war); (3) perceptions of institutions (opinion about corruption, trust in institutions, the degree to which the respondent believes effective institutions exist in the country, and support for income equality); and (4) social capital (how often the respondent meets up with friends, whether he/she is a member of a political party, and whether he/she is an active member of various social organisations).  $\gamma_k$  is a country fixed effect, and standard errors are clustered at the country level. Survey weights, which ensure that the data are representative at the country level, are used in all specifications. More information on the variables is available in the online Appendix.

We include age and health on the grounds that older and less healthy people may find their mood, and hence their feeling of life satisfaction, dropping during the lengthy interview. Therefore, we test if  $\beta_1 < 0$  (for individuals in the highest age categories) and  $\beta_2 > 0$ . In the happiness literature marital status is usually associated with higher levels of life satisfaction, and inclusion of this variable shortly before the second life satisfaction question may temporarily raise the mood of those who are married (implying that  $\beta_3 > 0$ ). Similarly, the literature shows that life satisfaction is positively correlated with income, education and employment. Being reminded of one's status on these matters before the second life satisfaction question may give a boost to the index for those who score well on these counts, and conversely may temporarily depress those who are uneducated, with low income or unemployed. Respondents with a more favourable parental background, better perceptions of institutions, and more social capital should also be more likely to report higher levels of life satisfaction in the second question as they are reminded about these aspects of their lives, so we expect that  $\beta_4 > 0$ . Country dummies, in addition to capturing fixed characteristics like geography or historical factors, may also allow us to understand if respondents in more repressive, less democratic regimes are inclined to overstate life satisfaction when invited to agree with the interviewer (on the grounds that people in these countries may be reluctant to "disagree" with the questioner in an official interview).<sup>14</sup>

Since our data set is not an individual panel, an important issue relates to the bias associated with unobservable characteristics, either at the individual, country or locality level. We believe that such a critique is less convincing in our case for several reasons. First, since we calculate our

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<sup>14</sup>Even though LiTS respondents are guaranteed anonymity, some may still be nervous about giving honest responses.

dependent variable using the response difference between the second and first life satisfaction question, fixed individual characteristics disappear. Moreover, we show that our estimates are robust to including a wide range of observable characteristics, such as age and marital status, social capital and interviewer characteristics. Crucially, our specifications include either country dummies (in the baseline specification) or dummies at the levels of sub-national administrative regions and even primary sampling units (PSUs) (in the robustness checks). We thus compare similar individuals within narrow geographical units (such as villages or city neighbourhoods when we look at within-PSU variation), which makes it less likely that our results are driven by spurious correlations.

Table 1 empirically tests the first three hypotheses on which we elaborated in the introduction. Column (1) shows that being in the highest age group (aged 63 and above) has a negative and statistically significant impact on the difference index, consistent with the notion that subjective well-being dips during the interview among the elderly. On average, older respondents report levels of happiness in the second life satisfaction question which are around 0.09 points lower, though this magnitude drops slightly when we introduce additional covariates in the other columns. While such an effect may appear small, one must keep in mind that the dependent variable is distributed with a very small mean (-0.15) but a relatively large standard deviation (1.07). Similarly, health status is also significantly and positively correlated with the difference index. However, the coefficient on being married, while positive, is imprecisely estimated.

The (unreported) coefficients of the country dummies are all significantly positive relative to the reference country, Russia, with the exception of the following countries: Azerbaijan, Belarus, Bulgaria, Georgia, Kazakhstan, Kyrgyz Republic, Kosovo, Tajikistan, Turkey and Uzbekistan.<sup>15</sup> With the exception of Bulgaria, these countries have had a chequered democratic experience since transition began, as captured by cross-country measures of democratic institutions, such as the Polity score.<sup>16</sup> These results are consistent with our hypothesis that respondents in less democratic countries may be more likely to agree with the first life satisfaction question and revise their response downward in the later question.

In the remaining columns of Table 1, we present the results of several specifications with framing variables, where different groups of variables are added separately to the baseline model of column 1. In column 2, we add the respondent's level of education (on a scale of 1 to 6, with 1 being no education and 6 being Master's and Ph.D.-level education), income (as measured by self-assessment of one's position on a 10-step income ladder) and a dummy variable for employment in the past 12 months. Both education and income are positive and statistically significant, pointing to possible framing effects of questions about socio-economic status. A one-unit increase in education (for instance, from no education to primary education, or from Bachelor-level education to Master's/Ph.D) makes a respondent nearly 0.03 points happier in the second question, with a slightly higher effect of a one-standard deviation rise in income (0.042 points). These findings seem to outweigh a possible countervailing effect whereby richer and more educated people have a higher opportunity cost of time and hence may become impatient and dissatisfied by the time of the second life satisfaction question.

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<sup>15</sup>Estimates lose significance for Uzbekistan, Kazakhstan, Georgia and Turkey when all covariates are included in column 6, and the estimate for Belarus turns positive.

<sup>16</sup>See <http://www.systemicpeace.org/> for more information on the Polity data.

Column 3 instead adds to the baseline specification two variables that relate (largely) to the respondent's parents and grandparents. One is the level of the father's education (measured in years of full-time education), which has a positive impact on the difference index, and suggests that those whose fathers have on average four more years of education (roughly the difference between high-school and university) report happiness scores in the second question that are nearly 0.06 points higher. The other variable is a dummy for whether the respondent, or any of his/her parents or grandparents, were killed, injured or forced to move during the second world war. Because the latter question is asked just before the second life satisfaction question, one might expect an impact on responses. It turns out that there is either no impact, or even a positive one (when only displacement is considered in unreported results). While this may be surprising, it has been noted in the psychology literature that the recall of negative events in the distant past (as opposed to more recent ones) can result in higher life satisfaction than for those recalling positive events.<sup>17</sup>

In column 4 we add several variables relating to attitudes and beliefs about trust, corruption and the effectiveness of institutions. Although our expectation was that a negative view on these issues – for example, a belief that corruption is widespread – would be associated with a drop in the difference index, the results are either insignificant or go the opposite way. This is a puzzle that merits further investigation, but one possibility could be that more trustworthy people may be more likely to agree with the first life satisfaction question and reverse their response afterward. Interestingly, however, there is a statistically significant and negative relationship between the dummy variable capturing whether the respondent supports income equality and the difference in life satisfaction, in the magnitude of around 0.07 points.

In column 5 we introduce several social capital variables: whether the person meets regularly with friends (on a scale of 1 (never) to 5 (most days)), and participates in a political party (a dummy variable) or different organisations (ranging from 0 to 9 to capture all the organisations in which the respondent may be involved). In this case, we find supportive evidence for framing effects for two out of the three variables. Those who say they rarely or never meet up with friends tend to record lower life satisfaction scores in the second question, while those who are active in various organisations record a boost to their numerical life satisfaction. Membership in a political party is not significant. It is also possible that respondents with social capital find the interview more enjoyable, prompting them to give a higher answer to the second life satisfaction question.

Lastly, column 6 reports the results of an all-encompassing equation, including simultaneously all variables from the previous columns. The main conclusions for income, education, father's education and the social capital variables, as well as the country dummies, remain broadly valid, but some other results, including those relating to health and age, lose statistical significance, possibly because of including multiple controls in the same regression.

To test to what extent intervening questions and individual characteristics affect the recall of information and measurement error in life satisfaction responses, we next run a version of our estimating equation in which we simply take the absolute value of the difference as a dependent variable, thus ignoring whether answers to the second satisfaction question are higher or lower

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<sup>17</sup>See Schwarz (1999).

than the first one (see Chart A1 in the online Appendix for a snapshot of the distribution of this variable). The results, which are presented in Table 2, show that individuals with lower socio-economic status (captured by education, income and employment dummy) are less likely to give consistent responses. Using the point estimates in column 2, being employed increases response precision by around 0.03 points (3.8 per cent relative to the mean of the dependent variable), while the effect of a one-step increase in perceived income (on a ten-step income ladder) is around 0.02 points (2.4 per cent relative to the mean of the dependent variable).<sup>18</sup> This suggests that data on well-being for uneducated, low-income or unemployed groups may be subject to more noise, implying the need for robustness checks on these groups in life satisfaction studies. Controls for father's education, perceptions of institutions and social capital are not significant and do not change these results, hence they are omitted from the table to conserve space.

**Table 1:** Determinants of difference in answers to the two life satisfaction questions

	(1) Nine-point difference	(2) Nine-point difference	(3) Nine-point difference
<u>Baseline</u>			
Health	0.0379*** (0.0111)	0.0224* (0.0117)	0.0231* (0.0122)
Married	0.0162 (0.0144)	0.00764 (0.0144)	0.0109 (0.0163)
Age 18-22	0.0163 (0.0326)	0.0191 (0.0337)	0.00859 (0.0385)
Age 23-32	-0.00759 (0.0225)	-0.0171 (0.0237)	-0.0441 (0.0265)
Age 33-42	0.00501 (0.0158)	0.00836 (0.0161)	-0.00558 (0.0188)
Age 53-62	0.00141 (0.0196)	0.00859 (0.0201)	0.0167 (0.0253)
Age 63+	-0.0937*** (0.0213)	-0.0657*** (0.0214)	-0.0584** (0.0258)
<u>Individual SES</u>			
Education		0.0253*** (0.00609)	
Income		0.0254*** (0.00771)	
Employed		0.00670 (0.0196)	
<u>Parental background</u>			
Father's education			0.0141*** (0.00263)
Affected by war			0.0128 (0.0204)
Country dummies	✓	✓	✓
Observations	37792	36259	26045
R <sup>2</sup>	0.0428	0.0465	0.0481

Notes: Dependent variable is the nine-point difference between the second life satisfaction question and the first life satisfaction question. OLS - Coefficients are reported. Standard errors are clustered at the country level. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

<sup>18</sup>The absolute difference has a mean of 0.77 with a standard deviation of 0.76.

**Table 1 (continued)**

	(4) Nine-point difference	(5) Nine-point difference	(6) Nine-point difference
<u>Baseline</u>			
Health	0.0515*** (0.00961)	0.0359*** (0.0108)	0.0204 (0.0124)
Married	0.0289** (0.0133)	0.0167 (0.0147)	0.00897 (0.0166)
Age 18-22	0.0240 (0.0315)	0.00679 (0.0320)	-0.00325 (0.0461)
Age 23-32	-0.0126 (0.0224)	-0.0121 (0.0221)	-0.0396 (0.0257)
Age 33-42	0.00282 (0.0177)	0.00542 (0.0157)	-0.00145 (0.0183)
Age 53-62	-0.00403 (0.0226)	-0.000264 (0.0194)	0.0203 (0.0289)
Age 63+	-0.0620** (0.0263)	-0.0916*** (0.0218)	-0.00349 (0.0269)
<u>Individual SES</u>			
Education			0.0111* (0.00627)
Income			0.0306*** (0.00846)
Employed			0.00776 (0.0228)
<u>Parental background</u>			
Father's education			0.00911*** (0.00277)
Affected by war			0.0271 (0.0226)
<u>Perception of institutions</u>			
Trust institutions	-0.0756*** (0.0153)		-0.0889*** (0.0181)
Effective institutions exist	-0.102*** (0.0179)		-0.0949*** (0.0211)
Political liberties exist	0.00966 (0.0200)		0.0112 (0.0227)
Corruption exists	0.00136 (0.00196)		0.00138 (0.00199)
Incomes should be more equal	-0.0662*** (0.0194)		-0.0610*** (0.0209)
<u>Social capital</u>			
Meet up with friends		0.0174** (0.00766)	0.0260** (0.0103)
Member of a political party		-0.0502 (0.0332)	-0.0691 (0.0432)
Active member of organisations		0.0256*** (0.00932)	0.0184 (0.0111)
Country dummies	✓	✓	✓
Observations	26945	37124	18939
R <sup>2</sup>	0.0567	0.0435	0.0670

Notes: Dependent variable is the nine-point difference between the second life satisfaction question and the first life satisfaction question. OLS - Coefficients are reported. Standard errors are clustered at the country level. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Table 2:** Determinants of absolute difference in answers to the two life satisfaction questions

	(1) Absolute difference	(2) Absolute difference
<u>Baseline</u>		
Health	-0.00678 (0.00732)	-0.0104 (0.00987)
Married	0.00147 (0.0110)	0.00247 (0.0162)
Age 18-22	-0.0195 (0.0137)	-0.0470** (0.0217)
Age 23-32	-0.00517 (0.0110)	-0.00817 (0.0185)
Age 33-42	-0.0167 (0.0108)	-0.0132 (0.0142)
Age 53-62	-0.0230* (0.0127)	-0.0275 (0.0172)
Age 63+	-0.0222 (0.0154)	-0.0297 (0.0204)
<u>Individual SES</u>		
Education	-0.00918** (0.00340)	-0.0100** (0.00474)
Income	-0.0197*** (0.00519)	-0.0183*** (0.00594)
Employed	-0.0335*** (0.0100)	-0.0293* (0.0155)
Parental background		✓
Perception of institutions		✓
Social capital		✓
Country dummies	✓	✓
Observations	36259	18939
R <sup>2</sup>	0.0318	0.0385

Notes: Dependent variable is the absolute difference between the second life satisfaction question and the first life satisfaction question. OLS - Coefficients are reported. Standard errors are clustered at the country level. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

To assess the salience of the life satisfaction response differences which we have analysed, we estimate two separate life satisfaction regressions (in levels) similar to those used in the happiness literature in Table A1. In column 1, we use the first question as a dependent variable, while in column 2 we run exactly the same specification using the second life satisfaction question (for comparability, both questions are coded on a 1-5 scale).<sup>19</sup> Columns 3 and 4 test for the equality of each pair of coefficients and show that we can reject equivalence for 5 out of the 10 independent variables. When life satisfaction is proxied with the second question, education, income and father's education exhibit a stronger effect (with the latter coefficient turning from insignificant in column 1 to significant in column 2). The higher coefficient on age and the lower coefficient on age squared in column 2 suggest that the U-shaped effect is flatter when the dependent variable is obtained from answers to the second life satisfaction question (both regressions show that happiness reaches its nadir when respondents are around 42 years old). In other words, while the correlates of the two well-being questions appear broadly similar in

<sup>19</sup>Including the number of children in the household (in unreported specifications) does not change these results.

our data, there are nevertheless several disparities which researchers should take into account. In addition, the magnitude and sign of the coefficients in Table A1 are very similar to those obtained in other cross-country work (using the World Values Survey) covering both transition and non-transition countries (Guriev and Zhuravskaya, 2009; Sanfey and Teksoz, 2007), which indicates that the results in this paper are not driven by the idiosyncrasies of the LiTS.



## 5 Extensions and robustness

Are the life satisfaction biases which we uncover different across transition and non-transition countries? Keeping in mind the caveat that our sample contains only six non-transition countries (France, Germany, Italy, Sweden, Turkey and the United Kingdom), in Table A2 we present results from interacting our independent variables with a transition country dummy (only variables with significant interaction terms are reported to conserve space). We find that in transition countries those who are healthier, married and more trusting of institutions are more likely to report a *lower* life satisfaction score in the second question, while those who are richer are more likely to overreport happiness in the second question. None of the transition dummy interactions with the other independent variables are significant, suggesting that response inconsistencies are similar across transition and non-transition countries.

We test the robustness of our results in Table 3. In each case, we take the inclusive version of the model; that is, the equivalent of column 6 in Table 1. To further alleviate concerns about local-level unobservable characteristics, column 1 replaces the country dummies with dummies at the level of sub-national administrative regions. Instead, column 2 includes dummies at the primary sampling unit level (PSU), which essentially implies that we are comparing individuals within very small geographic units such as villages or city neighbourhoods (both specifications cluster the errors at either the regional or PSU level). Finally, column 3 introduces interviewer dummies.<sup>20</sup> In all three cases, the results are broadly consistent with those in Table 1, although sometimes in columns 2 and 3 they are less precisely estimated, possibly because we are dropping useful variation from our estimations.<sup>21</sup>

We implement several additional robustness tests in the online Appendix. In Tables A3 and A4 we relax the cardinality assumption on which our OLS regressions are based and show that our results are robust to using ordinal models (multinomial logit and ordered probit; marginal coefficients are reported in both tables). Following Conti and Pudney (2011), in Table A3 we distinguish three states:  $S_2 > S_1$ ,  $S_2 < S_1$  and  $S_2 = S_1$  (the latter being the reference category). To conserve space in Table A4, we only report the coefficient estimates for the difference categories -2, 0 and 2. Results are broadly in line with our baseline specification: respondents with low socioeconomic status are more likely to under-report happiness in the second question, while those with social capital are less likely to record a lower life satisfaction score in the second question. The results on institutional perceptions and income equality also survive.

In Table A5, we control for interview day and time and interview duration. Although results are largely consistent, estimates should be treated with caution since data limitations shrink our sample considerably.<sup>22</sup> In unreported specifications, we failed to find an interaction effect between

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<sup>20</sup>Interviewer information is not available for Italy.

<sup>21</sup>Since income and the extent to which the respondent meets up with friends lose significance in column 2, we also ran specifications in which we include the average value of these variables for all respondents in the individual's PSU (excluding the respondent himself/herself). Our results indicate that this specification explains around 46 per cent of the observed variation in individual income and around 39 per cent of the observed variation in the individual propensity to meet up with friends, likely because these variables are highly correlated at the local level.

<sup>22</sup>Although interview duration may be endogenous to various individual characteristics, we do not find that any of our independent variables explain it in our sample.

interview duration and any of our independent variables, though of course this could arise from attenuation bias due to measurement error in the duration variable.

We probe the sensitivity of our results to an alternative and more flexible coding scheme of our dependent variable (which now ranges from -2 to 2) in Table A6. More precisely, if the respondent gave an answer of 1 or 2 in the first question, we regarded any answer of 1, 2, 3, or 4 in the second question as consistent and coded these cases as having a difference score of 0. For respondents who picked either 1 or 2 in the first question but 5 or 6 in the second question, we coded a difference score of 1. If a respondent picked 1 or 2 in the first question but 7, 8, 9 or 10 in the second question, then the difference score takes a value of 2. Following a similar logic, respondents with a life satisfaction score in the first question of 4 or 5 can pick 7, 8, 9 or 10 in the second question (for a difference score of 0), 5 or 6 (for a difference score of -1) and 1, 2, 3 or 4 (for a difference score of -2). Respondents who picked the middle category in the first question (3) can choose either 5 or 6 in the second question (for a difference score of 0), 1, 2, 3 or 4 (for a difference score of -1), or 7, 8, 9 or 10 (for a difference score of 1). The results in Table A6 are very similar to those we presented earlier.

In unreported specifications, we recoded our dependent variable as a standardised difference; that is, converting S1 and S2 to standardised scores (subtracting the mean across all observations and dividing by the standard deviation) and taking the difference. In a different specification, we dropped difference scores of -4 and 4. In both variants, the main conclusions derived from the model estimated earlier still hold.

**Table 3: Robustness table**

	(1) Nine-point difference	(2) Nine-point difference	(3) Nine-point difference
<u>Baseline</u>			
Health	0.0250* (0.0137)	0.0200 (0.0126)	0.0198 (0.0126)
Married	0.00501 (0.0179)	0.0247 (0.0186)	0.0277 (0.0198)
Age 18-22	-0.0126 (0.0417)	-0.00778 (0.0413)	0.0152 (0.0423)
Age 23-32	-0.0440* (0.0236)	-0.0264 (0.0270)	-0.0235 (0.0307)
Age 33-42	-0.00109 (0.0219)	0.0106 (0.0251)	0.0115 (0.0279)
Age 53-62	0.0154 (0.0288)	0.00437 (0.0280)	0.00827 (0.0293)
Age 63+	0.00559 (0.0385)	-0.00308 (0.0315)	-0.0379 (0.0318)
<u>Individual SES</u>			
Education	0.0136* (0.00749)	0.0168** (0.00767)	0.00975 (0.00811)
Income	0.0243*** (0.00687)	0.0101 (0.00732)	0.0131* (0.00756)
Employed	0.0188 (0.0190)	0.00749 (0.0213)	-0.0200 (0.0213)
<u>Parental background</u>			
Father's education	0.00823*** (0.00292)	0.00882*** (0.00260)	0.00977*** (0.00273)
Affected by war	0.0157 (0.0197)	0.0109 (0.0209)	0.0167 (0.0220)
<u>Perception of institutions</u>			
Trust institutions	-0.0879*** (0.0154)	-0.0839*** (0.0165)	-0.0743*** (0.0177)
Effective institutions exist	-0.0787*** (0.0273)	-0.0645*** (0.0189)	-0.0823*** (0.0189)
Political liberties exist	0.0449** (0.0200)	0.0372* (0.0222)	0.0158 (0.0223)
Corruption exists	-0.000257 (0.00181)	-0.000180 (0.00224)	-0.000853 (0.00244)
Incomes should be more equal	-0.0591*** (0.0204)	-0.0470** (0.0218)	-0.0442** (0.0224)
<u>Social capital</u>			
Meet up with friends	0.0164* (0.00957)	0.0101 (0.0110)	0.00221 (0.0109)
Member of a political party	-0.0706 (0.0484)	-0.0691* (0.0382)	-0.0311 (0.0377)
Active member of organisations	0.0318** (0.0129)	0.0290* (0.0150)	0.0147 (0.0136)
Region dummies	✓		
PSU dummies		✓	
Interviewer dummies			✓
Observations	18939	18939	18176
R <sup>2</sup>	0.131	0.260	0.296

Notes: OLS - Coefficients are reported. Standard errors are clustered at the country level. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

## 6 Conclusion

We exploit the rare opportunity to observe answers to two similar life satisfaction questions asked during the same interview in the LiTS. We conclude that the ordering and wording of questions on subjective well-being can influence the responses, and that this fact should be taken into account when designing household questionnaires and interpreting the resulting data. To summarise: we found that there is a high degree of consistency between the answers to the two questions on life satisfaction. That is good news for the happiness literature, because it helps to rebut the view that data on subjective well-being are noisy and unduly influenced by whims. Furthermore, our findings that sensitive questions on institutions and corruption do not bias responses in the second life satisfaction question downward is encouraging, particularly in light of the opposite conclusion reached by Deaton (2012) for the United States.

However, our analysis also shows that for around 14 per cent of respondents, life satisfaction changed significantly from the first to the second question. Older and less healthy people appear to experience a drop in satisfaction during the interview, and intervening questions related to individual SES, parental background and social capital can trigger changes in well-being, perhaps by reminding people of pleasant or unpleasant aspects of their lives. The striking differences in responses to the two questions in more repressive regimes indicates the need for care in interpreting other questions where the interviewee is invited to agree or disagree with the interviewer. We also find that the life satisfaction responses of those who have less income, education or are unemployed are more noisy.

These results point to a number of methodological suggestions for future research in this area. First, the length of the questionnaire needs to be considered and, if possible, shortened. The fact that older and relatively unhealthy people show a drop in life satisfaction during the interview suggests that their responses to other questions that come towards the end may be contaminated by fatigue. In addition, researchers studying the determinants of life satisfaction may wish to run robustness tests on those sub-samples of respondents which we identified as more prone to “imprecise” answers. More broadly, the “gold-standard” approach would be to use two identical life satisfaction questions whose position is randomly assigned in the survey. Unfortunately, a research design of this type may be difficult and expensive to carry out in a large cross-country survey such as the LiTS. In the absence of such an approach, we believe that the research strategy adopted in this paper provides an important methodological contribution.

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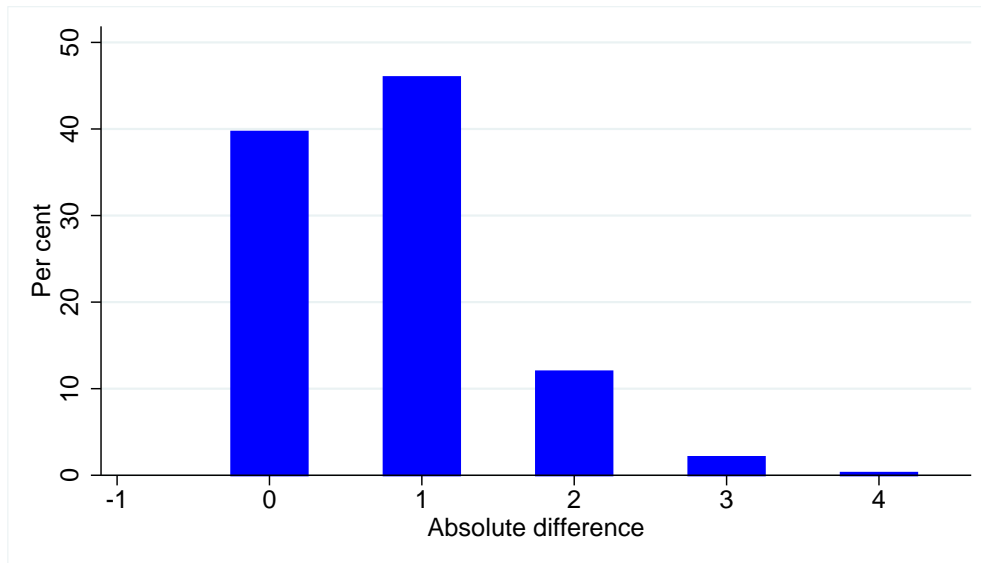
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# ONLINE APPENDIX

## Additional charts and tables

**Chart A1:** Histogram of the absolute difference in responses



**Table A1: Life satisfaction regressions using S1 and S2**

	(1) S1	(2) S2	(3) $\chi^2$	(4) p-value
Health	0.163*** (0.0107)	0.169*** (0.0120)	0.34	0.560
Married	0.123*** (0.0145)	0.121*** (0.0170)	0.01	0.933
Age	-0.0273*** (0.00293)	-0.0193*** (0.00292)	9.74	0.002
Age <sup>2</sup>	0.000319*** (0.0000300)	0.000232*** (0.0000314)	14.10	0.000
Male	-0.0569*** (0.0176)	-0.0530*** (0.0164)	0.06	0.799
Education	0.0312*** (0.00711)	0.0470*** (0.00821)	6.52	0.011
Income	0.205*** (0.0117)	0.226*** (0.0125)	7.79	0.053
Employed	0.0372** (0.0178)	0.0375** (0.0161)	0.00	0.986
Father's education	-0.00184 (0.00255)	0.00850*** (0.00210)	16.05	0.000
Affected by war	0.00630 (0.0190)	0.0241 (0.0197)	0.72	0.395
Country dummies	✓	✓		
Observations	25427	25666		
R <sup>2</sup>	0.266	0.343		

Notes: Dependent variable in column 1 is the first life satisfaction question, while in column 2 it is the second life satisfaction question. Both questions are coded on a 1-5 scale (see text for more details). OLS - Coefficients are reported. Standard errors are clustered at the country level. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .



**Table A2:** Examining the difference in response biases between transition and non-transition countries

	(1) Nine-point difference
Transition	-0.0762 (0.309)
Health	0.0593*** (0.0167)
Health * Transition	-0.0519** (0.0241)
Married	0.0884*** (0.0161)
Married * Transition	-0.138*** (0.0262)
Income	-0.00616 (0.00713)
Income * Transition	0.0532*** (0.0114)
Trust institutions	-0.0549 (0.0369)
Trust institutions * Transition	-0.101** (0.0423)
Country dummies	
Other controls and interactions	✓
Observations	18940
$R^2$	0.0381

Notes: Dependent variable is the nine-point difference between the second life satisfaction question and the first life satisfaction question. OLS - Coefficients are reported. Standard errors are clustered at the country level. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Table A3: Multinomial logit specification**

	(1) Pr(S2>S1)	(2) Pr(S2<S1)
<u>Baseline</u>		
Health	0.00668 (0.00502)	-0.00768 (0.00684)
Married	0.00998 (0.00639)	-0.00227 (0.00938)
Age 18-22	-0.00773 (0.0193)	-0.0137 (0.0193)
Age 23-32	-0.0111 (0.0112)	0.0157 (0.0127)
Age 33-42	0.00197 (0.00801)	0.00389 (0.0110)
Age 53-62	0.00383 (0.0101)	-0.0128 (0.0127)
Age 63+	-0.00454 (0.0103)	0.0101 (0.0153)
<u>Individual SES</u>		
Education	-0.0000309 (0.00275)	-0.00811*** (0.00273)
Income	0.00368 (0.00335)	-0.0171*** (0.00309)
Employed	-0.00259 (0.00871)	-0.00349 (0.0107)
<u>Parental background</u>		
Father's education	0.00303*** (0.000905)	-0.00346*** (0.00120)
Affected by war	0.0143* (0.00860)	-0.0103 (0.00986)
<u>Perception of institutions</u>		
Trust institutions	-0.0333*** (0.00670)	0.0270*** (0.00751)
Effective institutions exist	-0.0248*** (0.00826)	0.0348*** (0.00842)
Political liberties exist	0.00123 (0.00851)	-0.00650 (0.00798)
Corruption exists	-0.0000553 (0.000586)	-0.00124 (0.000969)
Incomes should be more equal	-0.0192** (0.00876)	0.0249*** (0.00919)
<u>Social capital</u>		
Meet up with friends	0.00431 (0.00400)	-0.0122*** (0.00392)
Member of a political party	-0.00206 (0.0173)	0.0379*** (0.0137)
Active member of organisations	0.00454 (0.00542)	-0.0130* (0.00732)
Country dummies	✓	✓
Observations	18940	18940

Notes: Marginal coefficients are reported. Standard errors are clustered at the country level. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Table A4: Ordered probit specification**

	(1) Nine-point difference=-2	(2) Nine-point difference=0	(3) Nine-point difference=2
<u>Baseline</u>			
Health	-0.00242* (0.00142)	0.00115* (0.000692)	0.00189* (0.00110)
Married	-0.00106 (0.00192)	0.000503 (0.000933)	0.000823 (0.00150)
Age 18-22	0.00000590 (0.00533)	-0.00000281 (0.00254)	-0.00000460 (0.00416)
Age 23-32	0.00447 (0.00297)	-0.00213 (0.00141)	-0.00348 (0.00231)
Age 33-42	0.0000833 (0.00213)	-0.0000397 (0.00101)	-0.0000650 (0.00166)
Age 53-62	-0.00250 (0.00333)	0.00119 (0.00159)	0.00195 (0.00259)
Age 63+	0.000403 (0.00315)	-0.000192 (0.00150)	-0.000314 (0.00246)
<u>Individual SES</u>			
Education	-0.00130* (0.000707)	0.000618* (0.000337)	0.00101* (0.000577)
Income	-0.00358*** (0.000981)	0.00170*** (0.000438)	0.00279*** (0.000782)
Employed	-0.000974 (0.00263)	0.000464 (0.00125)	0.000760 (0.00205)
<u>Parental background</u>			
Father's education	-0.00105*** (0.000313)	0.000502*** (0.000154)	0.000822*** (0.000242)
Affected by war	-0.00318 (0.00266)	0.00152 (0.00123)	0.00248 (0.00203)
<u>Perception of institutions</u>			
Trust institutions	0.0102*** (0.00217)	-0.00484*** (0.000960)	-0.00793*** (0.00173)
Effective institutions exist	0.0108*** (0.00264)	-0.00516*** (0.00108)	-0.00845*** (0.00201)
Political liberties exist	-0.00132 (0.00256)	0.000629 (0.00120)	0.00103 (0.00199)
Corruption exists	-0.000169 (0.000230)	0.0000805 (0.000109)	0.000132 (0.000180)
Incomes should be more equa	0.00703*** (0.00251)	-0.00335*** (0.00107)	-0.00549*** (0.00196)
<u>Social capital</u>			
Meet up with friends	-0.00297** (0.00118)	0.00142** (0.000559)	0.00232** (0.000937)
Member of a political party	0.00791 (0.00497)	-0.00377* (0.00228)	-0.00617 (0.00396)
Active member of organisations	-0.00212* (0.00126)	0.00101 (0.000626)	0.00166 (0.00101)
<u>Country dummies</u>			
Mean	18940	18940	18940
Observations			

Notes: Marginal coefficients are reported. Standard errors are clustered at the country level. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Table A5: Interview duration and date of interview effects**

	(1) Nine-point difference	(2) Nine-point difference	(3) Nine-point difference
Interview duration		0.00173 (0.00154)	0.000755 (0.000769)
<u>Baseline</u>			
health	-0.00599 (0.0199)	-0.00549 (0.0200)	0.0208 (0.0166)
married	-0.0348 (0.0238)	-0.0350 (0.0240)	-0.0160 (0.0193)
Age 18-22	0.0558 (0.105)	0.0571 (0.105)	-0.0228 (0.0631)
Age 23-32	0.00384 (0.0410)	0.00433 (0.0409)	-0.0408 (0.0315)
Age 33-42	0.0500 (0.0339)	0.0511 (0.0340)	0.0180 (0.0187)
Age 53-62	0.0350 (0.0493)	0.0354 (0.0495)	0.00919 (0.0345)
Age 63+	-0.0486 (0.0545)	-0.0475 (0.0548)	-0.0228 (0.0326)
<u>Individual SES</u>			
Education	0.0211 (0.0144)	0.0213 (0.0143)	0.0119 (0.00853)
Income	0.0600*** (0.0147)	0.0598*** (0.0147)	0.0313*** (0.0101)
Employed	0.0120 (0.0505)	0.0112 (0.0504)	-0.00381 (0.0310)
<u>Parental background</u>			
Father's education	0.00866 (0.00726)	0.00864 (0.00726)	0.0111*** (0.00402)
Affected by war	-0.0140 (0.0413)	-0.0145 (0.0410)	0.0105 (0.0322)
<u>Perception of institutions</u>			
Trust institutions	-0.0940*** (0.0221)	-0.0939*** (0.0223)	-0.0831*** (0.0239)
Effective institutions exist	-0.134*** (0.0333)	-0.134*** (0.0332)	-0.139*** (0.0257)
Political liberties exist	-0.0348 (0.0297)	-0.0347 (0.0295)	0.0210 (0.0306)
Corruption exists	0.00569 (0.00420)	0.00572 (0.00420)	0.00238 (0.00206)
Incomes should be more equal	-0.0300 (0.0431)	-0.0319 (0.0435)	-0.0676** (0.0306)
<u>Social capital</u>			
Meet up with friends	0.0375 (0.0234)	0.0375 (0.0232)	0.0217 (0.0134)
Member of a political party	-0.133* (0.0647)	-0.133* (0.0645)	-0.0921* (0.0538)
Active member of organisations	0.00338 (0.0249)	0.00292 (0.0249)	0.0286* (0.0154)
Country dummies	✓	✓	✓
Date of interview dummies	✓	✓	
Observations	4638	4638	11876
R <sup>2</sup>	0.0711	0.0715	0.0580

Notes: Dependent variable is the nine-point difference between the second life satisfaction question and the first life satisfaction question. OLS - Coefficients are reported. Standard errors are clustered at the country level. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Table A6: Five-point difference**

	(1) Five-point difference	(2) Five-point difference	(3) Five-point difference
<u>Baseline</u>			
Health	0.0137 (0.00826)	0.000602 (0.00777)	0.00199 (0.00882)
Married	-0.00517 (0.0121)	-0.0122 (0.0122)	-0.0111 (0.0135)
Age 18-22	0.0192 (0.0241)	0.0232 (0.0242)	0.0139 (0.0277)
Age 23-32	0.00494 (0.0188)	-0.00161 (0.0201)	-0.0162 (0.0232)
Age 33-42	0.0137 (0.0128)	0.0161 (0.0133)	0.0135 (0.0149)
Age 53-62	-0.00737 (0.0149)	-0.000148 (0.0156)	0.00838 (0.0179)
Age 63+	-0.0925*** (0.0151)	-0.0638*** (0.0161)	-0.0715*** (0.0199)
<u>Individual SES</u>			
Education		0.0212*** (0.00517)	
Income		0.0184** (0.00708)	
Employed		0.0150 (0.0153)	
<u>Parental background</u>			
Father's education			0.0108*** (0.00216)
Affected by war			0.00411 (0.0172)
Country dummies	✓	✓	✓
Observations	37795	36261	26044
R <sup>2</sup>	0.0465	0.0499	0.0522

OLS - Coefficients are reported. Standard errors are clustered at the country-administrative regional level. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Table A6: Five-point difference (continued)**

	(4) Five-point difference	(5) Five-point difference	(6) Five-point difference
<u>Baseline</u>			
Health	0.0245*** (0.00671)	0.0134 (0.00797)	-0.0000496 (0.00840)
Married	0.00180 (0.0107)	-0.00561 (0.0121)	-0.0149 (0.0140)
Age 18-22	0.0158 (0.0248)	0.0125 (0.0241)	0.00413 (0.0365)
Age 23-32	0.000220 (0.0200)	0.000349 (0.0186)	-0.0119 (0.0247)
Age 33-42	0.0148 (0.0146)	0.0143 (0.0126)	0.0227 (0.0164)
Age 53-62	-0.00670 (0.0181)	-0.00900 (0.0146)	0.0160 (0.0222)
Age 63+	-0.0724*** (0.0192)	-0.0932*** (0.0158)	-0.0258 (0.0213)
<u>Individual SES</u>			
Education			0.0135** (0.00505)
Income			0.0247*** (0.00696)
Employed			0.0138 (0.0182)
<u>Parental background</u>			
Father's education			0.00652** (0.00244)
Affected by war			0.0162 (0.0183)
<u>Perception of institutions</u>			
Trust institutions	-0.0604*** (0.0106)		-0.0688*** (0.0121)
Effective institutions exist	-0.0744*** (0.0155)		-0.0724*** (0.0172)
Political liberties exist	0.00992 (0.0163)		0.0110 (0.0187)
Corruption exists	0.00186 (0.00146)		0.00182 (0.00152)
Incomes should be more equal	-0.0579*** (0.0174)		-0.0544*** (0.0197)
<u>Social capital</u>			
Meet up with friends		0.00973 (0.00599)	0.0153* (0.00774)
Member of a political party		-0.0446* (0.0252)	-0.0482 (0.0350)
Active member of organisations		0.0172** (0.00728)	0.00602 (0.00839)
Country dummies	✓	✓	✓
Observations	26945	37127	18938
R <sup>2</sup>	0.0621	0.0469	0.0731

Notes: Dependent variable is the five-point difference between the second life satisfaction question and the first life satisfaction question. OLS - Coefficients are reported. Standard errors are clustered at the country-administrative regional level. Significance levels: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

## **Additional data information**

*Dependent variables:* See description in text.

### **Baseline**

*Health:* Captures the respondent's self-reported health on a scale of 1 (very bad) to 5 (very good); LiTS 2010 q.704.

*Married:* Dummy variable for whether the respondent is married; LiTS 2010 q.701.

*Age dummies:* Include the following categories: 23-32; 33-42; 43-52; 53-62; and 63 and above; LiTS 2010 q.104.

### **Individual SES**

*Education:* Education of the respondent, on a scale of 1 (no education) to 6 (Master's/PhD); LiTS 2010 q.515.

*Income:* Income of the respondent's household, as measured on a 10-step income ladder; LiTS 2010 q.330.

*Employed:* Dummy variable for employment in the past 12 months; LiTS 2010 q.501.

### **Parental background**

*Father's education:* Years of respondent's father's full-time education; LiTS 2010 q.718.

*Affected by war:* Dummy for whether the respondent, or any of his/her parents or grandparents were killed, injured or forced to move during the second world war; LiTS 2010 q.721.

### **Perceptions of institutions**

*Corruption:* The degree to which the respondent believes that people like him/her have to make unofficial payments or gifts when using a range of public services (such as interacting with the

road police or going to courts for a civil matter), where 1 is never and 5 is always; LiTS 2010 q.601.

*Trust institutions:* The degree to which the respondent trusts a list of institutions and outcomes, such as parliament, courts, or foreign investors, on a scale of 1 (complete distrust) to 5 (complete trust); LiTS 2010 q.303.

*Effective institutions:* The degree to which the respondent believes that a list of institutions and outcomes, such as law and order and freedom of speech, exist in his country (on a scale of 1 (completely disagree) to 5 (completely agree) ; LiTS 2010 q.312.

*Income equality:* Dummy variable for whether the respondent supports income equality; LiTS 2010 q.316.

## **Social capital**

*Meet up with friends:* The extent to which the respondent meets up with friends, on a scale of 1 (never) to 5 (on most days); LiTS 2010 q.325.

*Member of a political party:* Dummy variable for whether the respondent is a member of a political party; LiTS 2010 q.712.

*Active member of organisations:* The number of voluntary organisations, such as labour unions and youth associations, of which the respondent is an active member; LiTS 2010 q.713.