

Unpacking the Determinants of Life Satisfaction: A Survey Experiment

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Abstract

We present results of a survey experiment aimed at assessing context effects on reporting life satisfaction, exerted by raising awareness of fundamental life domains through questionnaire manipulations. The longitudinal structure of our experimental design allows us to assess the effects of the questionnaire manipulation both between and within subject. In our sample, asking subjects to report satisfaction with life domains before reporting overall satisfaction with life generates a robust “unpacking” effect, as it shifts upwards the subsequent mean overall life satisfaction evaluations. In addition, raising awareness of life domains significantly increases reliability and validity of self-reported life satisfaction, by reducing the dispersion of responses and increasing the association between life satisfaction and life domain evaluations. We also detect heterogeneous effects across subgroups of our sample - such as people with children or in bad health - and discuss implications of these findings for research on life satisfaction.

JEL classification: C99, C83, I31.

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“It isn’t what you have or who you are or where you are or what you are doing that makes you happy or unhappy. It is what you think about it.”
Dale Carnegie, 1936. *How to Win Friends and Influence People.*

1 Introduction

The inability of objective economic indicators (such as per capita GDP, real wages, and financial wealth) to fully account for important aspects of citizens’ life has driven social scientists to develop novel measures of subjective well-being (SWB hereafter; for a general discussion on the economic relevance of subjective well-being measures, see Diener, 1984). Among many approaches, those relying on data from representative general surveys are the most promising and commonly used (see Frey and Stutzer, 2002a, b; van Praag and Ferrer-i-Carbonell, 2004; Bruni and Porta, 2005; Di Tella and MacCulloch, 2006; Clark, Frijters and Shields, 2008; and Dolan et al. 2008 for surveys). In these surveys, subjects are presented with a large number of questions concerning their socio-economic, demographic and health conditions. In addition, they are asked to self-report their life satisfaction on an ordered scale going from very dissatisfied to very satisfied. Standard assumptions of survey studies posit that respondents consciously and correctly report subjective information, and that this information is comparable interpersonally or over time for the same person (see Angelini et al., 2014). Of course, such assumptions are not innocuous. In particular, evaluating the level of satisfaction with one’s own life is a complex task that requires sophisticated cognitive processes to make sense of the question asked, build up a mental image of their life, and formulate and report adequate judgements (Schwarz and Strack, 1991). In this perspective, it is reasonable to expect that format elements such as the framing, number and order of questions, as well as the information inferred from preceding tasks, exert strong psychological effects on subjects’ responses and influence their informative content, with potentially strong implications for economic research that either studies the determinants of satisfaction with life or considers subjective measures as determinants of relevant economic outcomes (see Bertrand and Mullainathan, 2001, and Benjamin et al., 2012). The literature, reviewed in the next section, refers to these psychological survey artifacts as *context effects*.

In this paper, we present results of a survey experiment aimed at assessing context effects in subjects’ reported satisfaction with life, exerted by raising awareness of fundamental life domains - income, family, job, friends, sentimental relationships and health - through questionnaire manipulations. In particular, we compare overall life satisfaction evaluations from a benchmark questionnaire with no reference to life domains to those reported in two different questionnaires containing explicit reference to life domains. In both vari-

ants, before reporting their life satisfaction, subjects are presented with a list of the six life domains. However, only in the second variant subjects are required to evaluate their satisfaction with each single life domain.

Context effects are likely to influence the distribution of life satisfaction in several ways, and are also likely to affect its reliability - i.e., the ability of life satisfaction to produce stable and consistent results - and its validity - i.e. its ability to measure the concept that it is intended to measure (see Cronbach, 1971, and Cozby, 2001). First, we expect the mean of the distribution of life satisfaction to change depending on whether and how much individuals are satisfied with each domain, and on how much weight is attached to each domain. Second, helping subjects to build a more accurate representation of their satisfaction with life could result into a lower dispersion of subjective evaluations, reducing the variance of the distribution of life satisfaction and increasing its reliability. Finally, the overall evaluation could better reflect a weighted aggregation of the life domains when their salience is enhanced and subjects are induced to think more deeply about all the determinants of life satisfaction, thus increasing the validity of this measure.

Although the psychological literature is rich of contributions that analyze how the structure of the questionnaire affects subjects' responses, as far as we know there is no study that seeks to measure the empirical relevance of each of the context effects mentioned above in reporting life satisfaction. Moreover, a novel feature of our design is that we study how context effects change when the intensity of the awareness manipulation is gradually increased across questionnaire versions, starting from one with no reference to the life domains, moving to one that involves a weak manipulation in which subjects are simply presented with the list of life domains and, in turn, considering one that introduces a stronger manipulation, requiring subjects to evaluate their satisfaction with each domain before answering the general question. Finally, no previous contribution exploits experimental variation in treatment assignment both between subjects and within subjects over time, as we instead do.

While simply presenting subjects with a list of life domains does not alter their responses, we detect significant context effects on both the level and precision of the life satisfaction evaluations in the questionnaire with the strong awareness manipulation. Raising awareness about life domains reduces the variance of life satisfaction and increases the average of the reported evaluations, that we also find to be more correlated with satisfaction with domains.

We also show that the unpacking effect is heterogeneous with respect to respondents' characteristics: for instance, it is stronger for those reporting to be in bad health. A possible interpretation of this result is in terms of a "focusing illusion" effect (see Schkade and Kahneman, 1998), whereby unpacking leads people to consider their life in general,

without focusing on a single negative aspect, which would have otherwise been over-weighted in the overall evaluation. This result is especially relevant for research on the determinants of life satisfaction, as it illustrates that context effects not only reduce precisions of the estimates, because of the higher variance, but also that in a subjective well-being regression coefficients related with the variables for which we detect heterogeneous effects will change depending on the questionnaire version used.

The paper unfolds as follows. In the next section, we review the relevant psychological and economic literature dealing with context effects. In Section 3, we present our experimental design and state testable predictions by following the psychological literature. In Section 4, we discuss our econometric approach and present the results on the level and variance of reported life satisfaction, as well as on the association between overall evaluations and satisfaction with the six domains. Finally, in Section 5, we discuss the relevance of our findings for research on life satisfaction and conclude.

2 Literature review

This paper builds principally upon the literature on context effects in the elicitation of attitudes in surveys. Tourangeau and Rasinski, 1988, and Schwarz, 1999, provide thorough reviews of the relevant literature, while Schwarz and Strack, 1999, focus in particular on subjective well-being questions. In our case, context effects can be framed within models depicting the cognitive process respondents rely on when asked about satisfaction with life. Schwarz and Strack, 1991, highlight how such questions require respondents to carry out an almost-impossible task in a very limited amount of time: in a few seconds (Diener et al., 2000) they ought to make sense of the question asked, retrieve the relevant information, make a judgement, report it in accordance with the alternatives provided by the researchers and, in some instances, adjust it to match criteria of social desirability. As a consequence, reported levels of life satisfaction can be thought of as spot judgements, mainly based on information that is accessible at that point in time (Schwarz and Strack, 1999). Individuals truncate the information-search process as soon as they have collected enough information to formulate a judgement (Schwarz, 1999), and, by affecting the accessibility and salience of the information respondents use to build up a mental image of their life, prior items asked in the questionnaire may provide a framework to respond to later questions, generating context effects.

In line with this literature, we expect that information primed by listing or asking people to evaluate satisfaction with specific life domains could increase the reliability of the information about overall life satisfaction, as a more thorough information-seeking process ought to be carried out by respondents. The nature of the information primed is also

relevant to generate context effects, as not all of it is used to formulate subsequent judgments. Strack, Schwarz and Gschneidinger, 1985, show that life satisfaction evaluations of respondents who are asked to recall three positive life events before answering the general questions are higher than those of respondents who are asked to recall three negative life events. On the basis of an experiment where subjects are asked about satisfaction with their dating lives and with life in general, Strack, Martin and Schwarz, 1988, show that when a specific and a general question are placed within a conversational context where the researcher shows interest in both domains separately, information competing to the domain elicited by the specific question might be disregarded when answering the general one, as it might be considered as redundant (Tourangeau, Rasinksi and Bradburn, 1991, refer to this as a “subtraction” effect, while Schwarz, Strack and Mai, 1991, interpret it as a “contrast” effects). In this sense, the two different manipulations we carry out may be less or more salient in terms of information retrieval, and may have differential effects on the informational content of the general question.

Information primed by previous questions may not affect life satisfaction evaluations only in the information-retrieval phase. Schwarz and Strack, 1999, highlight how context information also affects the respondent’s understanding of the meaning of the life satisfaction question: does the researcher mean life as it was, as it is now, or as it will be? What aspects of life are of interest for the researcher? Similarly, McClendon and O’Brien, 1988, argue that by providing a clear frame of reference, contextual information should allow people to reduce measurement error due to “guessing”, and thus increase the reliability of the judgement expressed.

Conti and Pudney, 2011, analyse context effects in the reporting phase, related with labeling of the answer categories and with face-to-face interviews versus self-completion questionnaires. Exploiting exogenous variation in the labeling of the categories of a job satisfaction question across waves in the British Household Panel Survey - BHPS, they find that women are less likely than men to tick a response option that is numerically but not textually labeled, because of different preferences towards verbal versus numerical communication across genders. Furthermore, they show that oral interviews and the presence of children during interviews produce more positive satisfaction judgements (the “let’s put on a good show for the interviewer” and “not in front of the children” effects), and that women report lower job satisfaction if the partner is present during the interview, to conform to social norms about gender roles (the “don’t show your partner how satisfied you are” effect).

As general life satisfaction evaluations are carried out on the spot, mood-state effects might be present as well, and it has been shown that mood affects general questions more than questions related to specific life domains. For instance, Schwarz and Clore, 1983, show that satisfaction with life in general is lower for individuals that are asked about it

on a rainy day, although the robustness of these findings is called into question by more recent research (Lucas and Lawless, 2013). Deaton and Stone, 2013, show instead that asking political questions before life satisfaction leads people to report lower levels of satisfaction, and that different subgroups of the population are affected in different ways, thus changing well-being rankings across groups. Diener et al., 2000, instead highlight how the general “positivity” of respondents might affect evaluations of life satisfaction, as these may reflect latent dispositional tendencies more than evaluative judgements. This point is raised in a different flavour also by Clark et al., 2005, and Angelini et al., 2014, who stress that people might attach the same label to different concepts of well-being, hampering interpersonal comparability of SWB evaluations because of differences in reporting styles.

From a different perspective, enlisting life domains relevant for satisfaction with life or asking respondents to evaluate their satisfaction with these domains before expressing a general evaluation can generate what van Boven and Epley, 2003, call “unpacking effects”. In their view, presenting more detailed descriptions of a given event may change the subjective perception people hold of it, and make it more extreme. In a set of experiments, they show that people are less prone to give mild evaluations when they are presented with or asked to generate more detailed descriptions of a situation they are asked to evaluate (e.g. sludge burning operations causing “all kinds of respiratory diseases” vs. “asthma, lung cancer, throat cancer and all kinds of respiratory diseases”). According to the authors, unpacking a description makes it easier for people to recall features of the object of the evaluation they would not have considered otherwise, to generate a better mental image of the situation, and to think more in depth about the event. All these features allow respondents to gain awareness and to come forward with more extreme evaluations, that they would have probably not dared giving without a thorough comprehension of the topic to be assessed. Our survey experiment is the first case of “unpacking” manipulations in a life satisfaction questionnaire, and we expect to find similar results to the ones described above.

Van Boven and Epley, 2003, claim that unpacking effects extend the Support Theory for probability judgements proposed by Tversky and Koehler, 1994, to evaluative judgements. Support Theory states that detailing events into their disjoint components increases the overall perceived probability that the event may occur (e.g. the perceived probability of death by meningitis is lower than the sum of the perceived probabilities of death by viral meningitis or bacterial meningitis). A related psychological distortion is the so-called “identifiable victim” effect: Small and Loewenstein (2003) and Kogut and Ritov (2005) show that individuals donate more to help an identifiable victim than a statistical one, while Small and Loewenstein (2005) found greater anger toward identifiable perpetrators than to general ones. Finally, in economics, part-whole bias in contingent

valuation is another similar phenomenon: when asked to evaluate them separately, people are willing to pay more for the separate components of a good than for the bundled solution. Bateman et al., 1997, experimentally prove that this principle holds for the case of a drink and a burger vs. a fast-food menu made of the two goods, while Bernasconi et al., 2009, show that unpacking a single public good into two components increases private contributions to support its provision.

3 The Survey Experiment

3.1 Experimental Design

This study aims at assessing whether raising awareness of important life domains affects how subjects evaluate their satisfaction with life. In a nutshell, we manipulate the level of awareness by administering three different versions of a baseline questionnaire on life satisfaction: one including no reference to the life domains (henceforth indicated as T1), one simply presenting the list of the domains (T2) and, finally, one that requires subjects to explicitly evaluate satisfaction with each domain (T3). In our experiment we refer to six life domains - income, family, job, friends, sentimental relationships and health, that the literature has identified as main determinants of life satisfaction (Frey and Stutzer, 2002 a, b; Dolan, Peasgood and White, 2008). In all versions of the questionnaire, subjects are then required to report their life satisfaction by using the standard question “How satisfied are you with your life in general?” on a 10-point scale going from “very dissatisfied” to “very satisfied”. We are interested in understanding how the mean and the dispersion of the life satisfaction measure varies across treatments.

The detailed structure of the three treatments implemented in our experiment is graphically represented in Figure 1. The precise phrasing of the questionnaire manipulations is reported in the Appendix.

[FIGURE 1 ABOUT HERE]

Subjects in T1 take part in a two-phase experiment. In the first phase, subjects fill in a questionnaire that is divided into two parts. The first part contains general questions on the demographic, socio-economic and health conditions of the respondents. In the second part, instead, subjects report their life satisfaction. No reference to the life domains is made.

After 20 days from the first phase of the survey experiment, subjects in T1 are unexpectedly invited to complete a new and shorter questionnaire asking them to evaluate - according to a 10-point scale - their satisfaction with each of the six life domains. Subjects are told that the choice of the six life domains is motivated by the existing literature studying life satisfaction and its determinants. After completing the evaluations

of the domains, subjects are required to report their overall life satisfaction, as in the first phase. In order to avoid anchoring effects, the questions on the six life domains were differently framed with respect that on the overall life satisfaction, as they were invited to state how strongly they agreed with the statement "I am satisfied with [...]". The only difference between T1 and T2 concerns the first phase of the experiment. Indeed, before reporting their life satisfaction, subjects in T2 are asked the same socio-economic questions used in T1. However, they are also presented with a list containing the six life domains; subjects are simply invited to read the list, and are not required to express any explicit evaluation about the domains. Then, subjects report their overall life satisfaction on a 10-point scale. Apart from this difference, the design of T2 replicates that used in T1. In particular, the general questions in the first phase, as well as the timing, structure and questions of the second phase are kept constant between the two treatments.

On the other hand, T3 consists of a single phase, in which subjects first answer the general questions on their demographic, socio-economic and health conditions, and are then administered the same questions about their satisfaction with life domains and with life in general used in the second phase of the other two treatments.

Two aspects of our experimental design are particularly worth noticing from a methodological perspective. First, the impact of enhancing awareness on life satisfaction is ascertained by disentangling the mere effect of providing information about the domains from that of letting subjects think deeply and evaluate each aspect of life. Second, our design allows us to assess results both between and within subjects, by comparing the distribution of life satisfaction in the first phase across the three treatments and between the two phases of T1 and T2, respectively.

3.2 Procedures

The survey experiment took place between January and February 2013 and was administered by using Qualtrics (<http://www.qualtrics.com/>). Subjects are mainly students of economics from three different universities in Northern Italy (namely, Bocconi University in Milan, University of Varese-Insubria, and University of Padova), and were recruited by email after advertising the experiment through Facebook university groups. Once agreed to participate in the study, each subject was randomly and anonymously assigned to (only) one of the three different treatments. In order to guarantee anonymity and correctly match the responses across the two phases of T1 and T2, subjects were required to provide the first six digits of their personal tax code (which is an alpha-numeric code of 16 characters). In order to increase the external validity of our survey study, we followed the standard practice in well-known general surveys of not paying for subjects'

participation.

3.3 Testable Predictions

Two standard assumptions behind survey studies on the determinants of subjective well-being are that (i) subjects are able to evaluate their satisfaction with life and (ii) their evaluations do not depend on the order in which the questions are asked, e.g. on whether the question on overall life satisfaction is asked before or after specific life domains are presented in the questionnaire. This framework provides null predictions for our study, as we should observe differences neither in the distribution of life satisfaction evaluations across treatments, nor in the correlation between evaluations of life domains and the measures of life satisfaction reported in the two phases of T1 and T2.

However, as discussed in Section 2, there is a rich literature highlighting the existence of context effects in survey studies (see Schwarz and Strack, 1999). In this respect, we are interested in assessing how the questionnaire manipulations introduced in our survey experiment influence the observed distribution of life satisfaction and its association with life domains.

There are valid arguments to expect both the mean and the variance of the distribution of evaluations to vary across treatments and between phases. First, we expect the distribution of life satisfaction to change depending on whether and how much individuals are satisfied with each domain, and on how much weight is attached to each domain. Scholars of the Support Theory suggest that, in evaluative judgements, “the whole is less than the sum of its parts” (van Boven and Epley, 2003) and priming important details of objects to evaluate might induce subjects to report more extreme evaluations on the ordered scale used to express responses. More specifically, both in expressing positive (for instance, anticipated enjoyment with Bahamas vacation) and negative (for instance, suffering for health-detriments from pollution produced by an oil refinery) evaluations, subjects tend to report higher values in the positive or negative scale under the unpacking manipulation: more informed people are less likely to express mild judgements. Since most of our sample is composed of relatively young, middle-class, well-educated, and healthy individuals, we expect unpacking effects to positively affect life satisfaction evaluations. Furthermore, our experimental design allows us to disentangle the mere effect of providing information on important aspects of life from a more salient priming mechanism that relies on evaluating each life domain.

Second, by affecting the accessibility and salience of information, priming life domains might facilitate subjects in building up an adequate image of life satisfaction (Schwarz and Strack, 1991; Schwarz and Strack, 1999; Schwarz, 1999). Thus, it is reasonable to expect the variance of responses to be influenced by the questionnaire manipulations, as

subjects are likely to express more precise evaluations when information on life domains is provided, enhancing the reliability of life satisfaction. Again, as we manipulate the salience of the life domains across treatments and phases, we should expect the effect on the variance to be stronger when subjects express specific and separate evaluations on the domains than in the case in which they are simply presented with the list containing indications on these aspects of life.

Finally, we also want to assess how enhancing salience of the life domains affects the correlation between life satisfaction and the evaluation expressed for each domain, that is, its validity as a proxy for overall well-being. As highlighted in the previous section, subjects in T1 report their life satisfaction two times, with the second response (in the second phase) being expressed after the evaluations of the life domains. Thus, in formulating their second response, subjects in T1 can use all the accessible information on life satisfaction they obtain by facing specific questions on satisfaction with life domains (Schwarz and Strack, 1991; Schwarz and Strack, 1999). In addition to facilitating subjects to formulate a mental representation of life satisfaction, it is reasonable to expect the second response to exhibit a stronger (and more robust) association with the evaluations of the life domains just stated, thus making it more valid to measure people's overall welfare. Of course, under the assumption that the salience of life domains depends on priming manipulations, and that listing the domains has a weaker priming effect than asking subjects to provide evaluations of each domain, we should observe a similar effect of priming on correlations between life satisfaction and evaluations of life domains in T2.

4 Empirical analysis

This section describes our empirical analysis. We start by presenting the data and by showing some descriptive statistics related to the testable predictions. Then we move to a more formal econometric analysis. We will describe the empirical models exploited as we go through the analysis.

4.1 Data and descriptive statistics

Our sample is composed of the subjects who took part in the experiment described in Section 2. To make sure that no changes in the underlying determinants of SWB occurred among the two interviews, we drop the second-phase interviews of four subjects in treatments T1 and T2 who reported to have experienced extra-ordinary life changes across the two phases, including negative - the loss of a close relative, job displacement, divorce - as well as positive - the birth of a child, a promotion, and so on - events. Information recalled through the questionnaire consists of a set of questions about sat-

isfaction with life in general and with the six specific life domains presented in Section 2, plus standard socio-demographic controls. Aside from gender, from the raw data we generate a set of dummy variables for being younger than 30; having a partner; having children; reporting very good or good health; having a college degree; family income below €16,000, between €16,000 and €30,000, between €30,000 and €56,000, above €56,000; meeting friends at least once a week; not taking part in any cultural, political, sport-related or religious association; being born in Northern Italy. Descriptive statistics for the full sample are reported in Table 1.

[TABLE 1 ABOUT HERE]

As a result of our sampling strategy, we end up selecting mainly students or young workers. Table 1 shows that 78 percent of the sample is younger than 30, and that only 9 percent of the sample reports to have a child. Close to 70 percent of subjects report being in good health, and 53 percent have completed a college degree, while figures on income categories show that most subjects come from middle class or well-off families. While the extrapolation of our results to the general population is not guaranteed, internal validity of our causal statements is granted by randomization of subjects across the three treatment groups. To test for balancing in sample composition across treatments, we regress each of the covariates presented in the upper panel of Table 1 on a constant and dummies for belonging to T2 and T3, respectively. We report the constant and the coefficients for the two treatment group dummies in Table 2, together with their standard errors and significance level.

[TABLE 2 ABOUT HERE]

Overall, randomization worked well, as most differences are not statistically different from zero. However, we still detect some imbalancing across the three groups, probably due to small sample size: for instance, subjects in T3 are older and more likely to have children than subjects in T1, while group T2 is more imbalanced than group 1 in terms of sex ratios. Similar results are obtained when we estimate a generalized propensity score through a Multinomial Logit regression for treatment status on the same set of covariates (see Imbens, 2000, and Lechner, 2001). The R^2 of such a regression is around 0.1, confirming that the distribution of covariates across groups is only mildly different. To make sure we get rid of any potential source of selection bias, we are going to control for all covariates in our regression. We also show that our regression results are unchanged whether we include or exclude covariates, confirming that the imbalancing we detect is likely due to small sample noise, and thus enhancing the internal validity of our findings. Table 3 presents features of the distribution of overall life satisfaction, our dependent variable, and sample size by treatment and phase.

[TABLE 3 ABOUT HERE]

Evidence from Table 3 already provides useful insights about the effects of the treatment

on the distribution on life satisfaction. We begin by focusing on results for phase 1. Comparison of outcomes of groups T1 and T2 suggests that providing a list of life domains that are relevant for satisfaction with life as a whole does not affect the distribution of overall satisfaction with life, neither in terms of mean levels, nor in terms of standard deviation within each group. On the other hand, comparison of the outcomes of the former groups with T3 reveals the first evidence of unpacking effect as well as increased awareness on the topic to be evaluated: asking subjects to rate satisfaction with specific life domains leads them to express more positive judgements, and shrinks evaluations towards this higher mean level. Graphical evidence in this sense is reported in Figure 2, where we plot the Epanechnikov kernel density estimate of satisfaction with life across treatment groups in the full sample of phase 1. The Epps-Singleton test detects no significant differences between T1 and T2 (p-value=0.978), while the distribution of life satisfaction of group T3 is significantly different from that obtained by pooling T1 and T2 at the 1 percent level of significance (p-value=0.0028). The figure also shows that our result on the variance is unlikely due to a ceiling effect, as only a small fraction of subjects report evaluations of satisfaction with life using the highest available point on the evaluation scale.

[FIGURE 2 ABOUT HERE]

Finally, similar evidence of the unpacking effect is also present when we consider the longitudinal dimension of our experiment, and compare the distribution of satisfaction with life that subjects in T1 and T2 express in the two phases. In this sense, it is worth noticing that around 40 percent of the initial T1 and T2 subjects drop out from the survey between the two phases. As a consequence, longitudinal findings might be biased due to panel attrition if only people reporting higher satisfaction with life remain in the sample. We test for endogenous attrition by comparing mean baseline characteristics of the full sample and of the sample of “stayers”, both separately for T1 and T2 and jointly. The idea is that we want to test whether the sample of “stayers” is representative of the initial population, as suggested by Fitzgerald, Gottschalk and Moffitt, 1998. Results are presented in Table 4 and do not reveal any evidence of endogenous attrition, as we find perfect balancing across the two groups both in terms of the observable covariates and of the evaluation of life satisfaction carried out at baseline.

[TABLE 4 ABOUT HERE]

4.2 Econometric analysis

We carry out formal econometric analyses in this section. We start by exploiting the variation in treatment assignment between treatments within the first phase of the experiment, and analyse the effects of the questionnaire manipulations on the mean and

the variance of overall satisfaction with life. To estimate treatment effects on the mean of the dependent variable, we run simple linear regressions of overall life satisfaction on dummies for T2 and T3 and the set of covariates illustrated in the previous section, using heteroskedasticity-robust standard errors. On the other hand, we exploit Recentered Influence Function (RIF) regressions, as introduced by Firpo, Fortin and Lemieux, 2009, to estimate treatment effects on the unconditional variance of satisfaction with life across the three treatment groups (see also Clark, Fleche and Senik, 2012, who exploit similar RIF regressions on the variance of satisfaction with life). In both cases, identification is granted by random assignment to treatment, as documented in Section 4.1. Inclusion of covariates enforces conditional independence in case of randomization failure, and helps to increase precision of our estimates. Results are presented in Table 5.

[TABLE 5 ABOUT HERE]

Looking at Column 1, we see that presenting respondents with information on specific domains that are relevant for overall satisfaction with life before expressing a general judgement does not significantly affect evaluations relative to the benchmark treatment T1. On the other hand, asking respondents to elicit satisfaction with specific life domains before the general question exerts a significant and strongly positive unpacking effect on satisfaction with life: we detect a mean shift of 0.502 to 0.627, depending on the empirical specification. This corresponds to 7.2 to 8.9 percent of the mean of life satisfaction in the untreated (T1) group, that is equal to 7.02.

RESULT 1. In our sample, evaluating life domains before overall life satisfaction increases the mean of overall life satisfaction.

To assess the robustness of our results to the parametric specification imposed by the model, we also consider an alternative semi-parametric estimator. We implement the multi-valued treatment propensity score weighting estimator discussed in Imbens, 2000, and Lechner, 2001, where the propensity score is estimated through a Multinomial Logit model. We test that no covariate imbalancing is present after weighting each observation for the inverse of the probability of receiving the treatment actually received, and verify that when we consider overall life satisfaction as our dependent variable estimation results from this different specification - not shown - are quantitatively and qualitatively equivalent to our baseline model. Results are also robust to dropping observations that are extreme with respect to our propensity score metric. Finally, equivalent results not shown and available upon request are obtained when we treat overall life satisfaction as an ordinal measure and use Ordered Probit models.

We now turn our attention to understanding how adding explicit references to the life domains affects the variance of the reported levels of life satisfaction. As shown in Column

3, we find that simply presenting subjects with a list containing the life domains does not influence the standard deviation of life satisfaction, while asking subjects to elicit their satisfaction with each specific domain exerts a strong negative effect on the variance of life satisfaction (Columns 2 and 4 show that results are not dependent on the inclusion of covariates). We estimate that the unpacked treatment decreases life satisfaction by -1.923 to -1.373, depending on the specification, i.e., by -64 to -46 percent of the variance of life satisfaction in the untreated (T1) group, equal to 2.979. These differences are also consistent with the ones presented in Table 3 in terms of standard deviations.

RESULT 2. Evaluating life domains reduces the variance of the distribution of life satisfaction.

Together, the previous findings provide supporting evidence in favour of our hypotheses. Indeed, by raising awareness on the domains to be evaluated, asking subjects to report their satisfaction with the six life domains leads them to take a less mild position on their satisfaction with life and to reduce uncertainty in the evaluations, which shrink toward a higher mean level. Furthermore, focusing on the estimates presented in Column 1, most coefficients related with the covariates included in the equation have the expected signs (see Frey and Stutzer, 2002, and Dolan, Peasgood and White, 2008): satisfaction increases with income, and it is higher for the youngest in the sample, for those with children, those in good health and those who have more frequent contacts with friends. As a robustness check, we have also repeated this analysis on the subsample of stayers only, and results - not shown to save space - are unchanged.

Next, we exploit the variation between-phases and within-treatment by taking advantage of the fact that, in both T1 and T2, subjects state their life satisfaction twice, with the second evaluation being expressed after judging satisfaction with the six life domains. This longitudinal set-up allows us to estimate the effects of life domains evaluations on life satisfaction using within-subject variation. Since no difference in life satisfaction at baseline was detected between T1 and T2, we pool observations from these two groups and include a dummy variable for belonging to T2 in all models (we also checked for heterogeneous effects, but the interaction term was not significant). Since we consider repeated observations for the same individual, standard errors are clustered at the individual level. Table 6 presents estimation outcomes.

[TABLE 6 ABOUT HERE]

Results on the mean and the variance of overall life satisfaction are consistent with our previous findings both qualitatively and quantitatively: when subjects are primed with their own judgements on specific life domains, the mean level of life satisfaction increases and the distribution of the measure becomes more concentrated around this higher value.

Furthermore, results are robust to the exclusion of individual covariates, confirming the robustness of our findings.

As a placebo test, we also compared the distribution of the reported levels of satisfaction with life expressed in phase 2 by subjects in T1 and T2 with those expressed by subjects in T3 in phase 1. Finding no differences in the mean and the variance of the distribution of life satisfaction across treatment groups does not allow us to conclude that our results in the longitudinal analysis are not due to retesting effects, because we never observe a group receiving no information in both phases, yet it is reassuring to see that results in Table 7 confirm that no difference across groups exposed to the same treatment in different phases is detectable (furthermore, to the best of our knowledge, no evidence of positive changes in life satisfaction due to retesting is present in the literature).

[TABLE 7 ABOUT HERE]

So far, our results suggest that asking subjects to evaluate specific life domains before expressing an overall judgement on satisfaction with life raises their awareness about the general topic to be assessed and allows them to express more accurate evaluations. As a consequence, we expect to observe a higher correlation between life satisfaction and satisfaction with life domains when these are elicited before the general question. To test this hypothesis, we focus on subjects in the longitudinal sample, for whom we observe two general evaluations, one expressed without prior assessment of specific life domains, in phase 1, and one elicited after domains evaluation, in phase 2. We run two simple linear regressions of the two overall evaluations on the evaluations of the specific domains and controls for gender, age, and geographical origin. We drop other covariates as they represent objective measures of the specific domains evaluated. Results are presented in Table 8, and suggest that evaluations carried out in phase 2, after domains elicitation, are more strongly correlated with satisfaction with the domains. The Chow test confirms that these differences are statistically significant (the p-value is 0.010 when including the covariates and 0.065 when excluding them). Furthermore, the R^2 of regressions for phase 1 is equal to 0.26 and 0.17 with and without covariates, respectively, while it equals 0.59 for both phase 2 regressions. These results confirm that raising awareness about life domains decreases the influence of mood state, guesses and measurement error in the general evaluations, increasing the coherence between self-reported satisfaction with domains and satisfaction with life as a whole. As a robustness check, we repeat the same analysis for T3 at phase 1, where domain evaluations are elicited before asking the general question. As expected, the results are comparable to those of phase 2 (see column 5 and 6).

RESULT 3. Evaluating life domains increases the correlation between these responses and the (subsequently) reported level of life satisfaction.

[TABLE 8 ABOUT HERE]

We now turn to a subgroup analysis, aimed at assessing whether the context effects we have detected are homogeneous across the population. Assuming that context effects affect everyone in the same way, as first stressed by Bertrand and Mullainathan, 2001, the main risk related with using measures of life satisfaction from questions asked “out of the blue” within a survey is related with loss of estimation precision if these measures are used as outcomes, or attenuation bias if these measures are used as controls. The risks could even be more worrisome, however. If the effects of using contextualized vis-à-vis uncontextualized questions are heterogeneous with respect to individual characteristics such as age, gender, or health status, then coefficients related with these variables in a subjective well-being regression will change depending on the questionnaire version used, making it difficult for analysts to understand whether subgroup differences in well-being are germane or due to context effects.

Even if our sample is quite homogeneous in terms of observable characteristics (see Table 1), the descriptive analysis on our longitudinal sample, presented in Table 9, shows that there is indeed heterogeneity in the effect of the unpacking manipulation on the basis of individuals’ baseline characteristics. When we add interaction terms between the second phase dummy and individual-level covariates, we find that the phase-two dummy is still significant and that the interactions are also jointly significant (p-value = 0.000). Hence, we reject that the unpacking effect is homogeneous across all people in our sample. The coefficients related with the interaction terms also convey interesting evidence. For instance, the youngest, parents, people in good health and members of social associations at baseline experience smaller changes in life satisfaction when exposed to the “unpacked” questionnaire than the oldest, those without children, people in bad health, and people that are not members of social associations. The unpacking manipulation may allow the latter groups to consider other life domains beyond, for instance, their bad health when assessing overall satisfaction with life, with a positive effect on their self-reported well-being level. This interpretation is in line with the well-known “focusing illusion” effect (see Schkade and Kahneman, 1998, and Wilson et al., 2000), according to which people tend to overstate the emotional consequences of a particularly salient circumstance, neglecting the overall context in which this takes place. Hence, this effect is also attenuated by the use of an unpacked version of the life satisfaction question.

[TABLE 9 ABOUT HERE]

5 Conclusions

The aim of the paper was to assess how raising awareness of six specific life domains - income, family, job, friends, sentimental relationships and health - affects subjects' self-reported levels of life satisfaction. In order to investigate the relevance of this specific context effect, we administered a survey experiment based on three different questionnaire versions that can be ordered on the basis of the intensity of the awareness manipulation: one with no reference to the life domains, one including simply the list of the life domains and, finally, one in which subjects evaluate each domain before expressing their overall satisfaction with life.

We document a strong and robust unpacking effect, whereby evaluating the (subjective) conditions with the domains makes subjects in our sample more satisfied with their life. In addition, raising awareness of the domains substantially reduces the dispersion of responses and increases the association between life satisfaction and life domain evaluations. Finally, we have shown that the effects are not homogeneous across subgroups, with relevant implications for the estimation of subjective well-being equations using different questionnaire versions.

Our study is not exempted from limitations that are mainly related to the application to more realistic settings and the generalizability of the conclusions. Of course, these considerations suggest the necessity to replicate and extend our approach. Nevertheless, we believe that the contribution of the present paper to the existing literature is twofold. First, our results offer relevant insights to the flourishing empirical literature on life satisfaction. They suggest that framing and context effects play a substantial role in isolating what people should refer to when asked to evaluate their satisfaction with life, and stress the necessity to raise awareness of the determinants of life satisfaction to produce more precise and reliable subjective measures of well-being. Second, our results also caution researchers about the potential problems of data comparability across different sources. While in some cases the overall evaluation of life satisfaction is anticipated by questions concerning the subjective conditions with specific life domains (see for instance the fifteenth wave of the British Household Panel Survey - BHPS, the 2004 edition of the German Socio-Economic Panel - SOEP, the second wave of the Household, Income and Labor Dynamics in Australia Survey - HILDA), in other cases life satisfaction is assessed with no reference to the life domains (to mention some examples, the sixth wave of the European Social Survey - ESS, the sixth wave of the World Value Survey - WVS). As suggested by the present study, manipulating the structure of the questionnaire makes life satisfaction assessments not entirely comparable across different surveys and waves, as it is likely to alter the distribution of the responses substantially.

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Figures and Tables

Figure 1: The Experimental Design

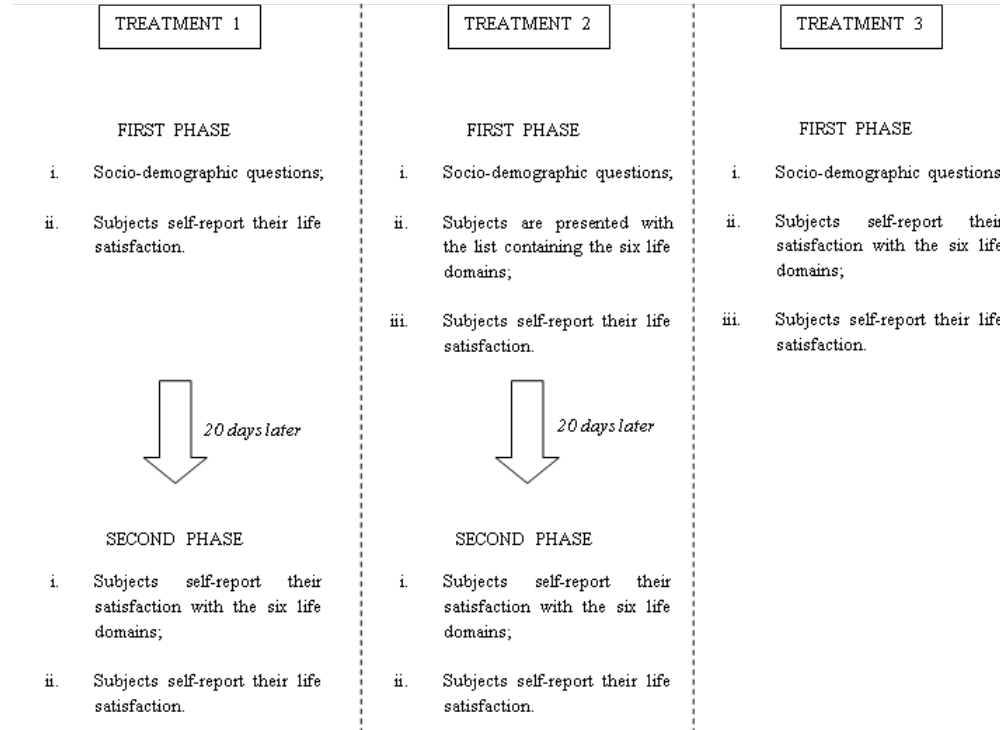


Figure 2: Epanechnikov Kernel Density Estimate of Life Satisfaction in Phase 1

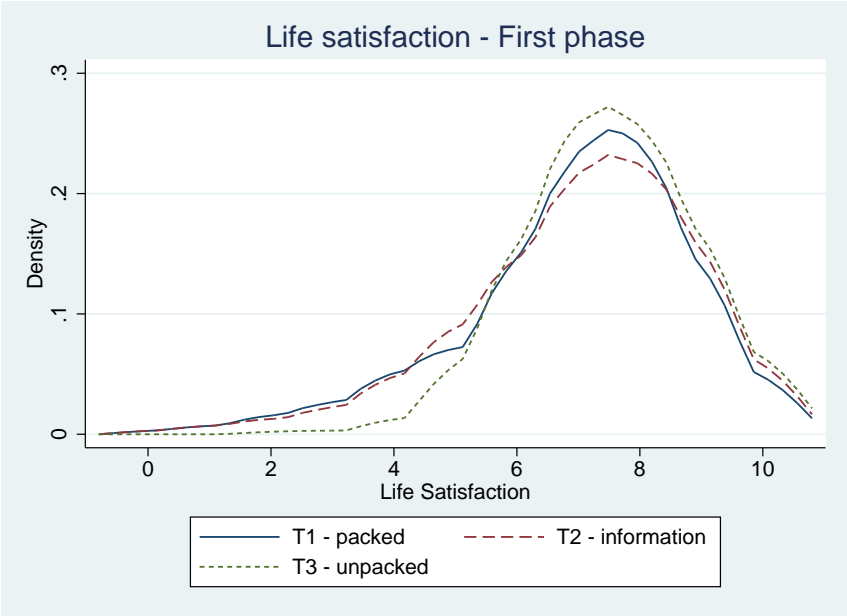


Table 1: Descriptive Statistics

	Mean	Standard Deviation	Observations
Female	0.570	0.496	342
Age below 30	0.798	0.402	342
Has a partner	0.342	0.475	342
Has children	0.099	0.300	342
In good health	0.708	0.456	342
College degree	0.526	0.500	342
Mid-low income	0.307	0.462	342
Mid-high income	0.266	0.443	342
High income	0.170	0.376	342
Meeting friends often	0.678	0.468	342
Associations membership	0.459	0.499	342
From Northern Italy	0.459	0.499	342
Satisfaction with life	7.371	1.470	469
Satisfaction with income	6.236	2.108	267
Satisfaction with family	7.562	1.894	267
Satisfaction with work or study	6.577	1.957	267
Satisfaction with friends	7.779	1.606	267
Satisfaction with partner	6.431	2.924	267
Satisfaction with health	7.790	1.639	267

Notes: See Table 3 for sample size definition.

Table 2: Balancing tests

	Mean T1	T2-T1	T3-T1
Female	0.495	0.149** (0.069)	0.076 (0.065)
Age below 30	0.911	-0.020 (0.042)	-0.261*** (0.049)
Has a partner	0.386	-0.010 (0.069)	-0.100 (0.062)
Has children	0.050	-0.020 (0.028)	0.136*** (0.039)
In good health	0.723	-0.059 (0.065)	0.006 (0.059)
College degree	0.396	0.050 (0.070)	0.283*** (0.063)
Mid-low income	0.277	0.069 (0.065)	0.023 (0.059)
Mid-high income	0.347	-0.129** (0.063)	-0.104* (0.060)
High income	0.178	-0.079 (0.049)	0.036 (0.052)
Meeting friends often	0.782	-0.079 (0.062)	-0.196*** (0.059)
Associations membership	0.455	-0.010 (0.070)	0.016 (0.065)
From Northern Italy	0.584	-0.069 (0.070)	-0.256*** (0.063)
Observations	342		

Notes: we report mean values of the covariates for individuals in treatment group 1 in column 1, and differences in mean values between treatment group 2 (3) and treatment group 1 in column 2 (3). Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 3: Life satisfaction across treatments and phases

	Treatment 1	Treatment 2	Treatment 3
Phase 1	Mean: 7.020 Standard deviation: 1.726 Observations: 101	Mean: 7.079 Standard deviation: 1.747 Observations: 101	Mean: 7.521 Standard deviation: 1.249 Observations: 140
Phase 2	Mean: 7.655 Standard deviation: 1.001 Observations: 58	Mean: 7.768 Standard deviation: 1.178 Observations: 69	

Table 4: Attrition

	Sample	Mean full sample	Mean stayers	Difference
Satisfaction with life	T1 & T2	7.050	7.205	-0.155
	T1	7.020	7.069	-0.049
	T2	7.079	7.319	-0.240
Female	T1 & T2	0.569	0.559	0.010
	T1	0.495	0.500	-0.005
	T2	0.644	0.609	0.035
Age below 30	T1 & T2	0.901	0.921	-0.020
	T1	0.911	0.966	-0.055
	T2	0.891	0.884	0.007
Has a partner	T1 & T2	0.381	0.378	0.003
	T1	0.386	0.397	-0.010
	T2	0.376	0.362	0.014
Has children	T1 & T2	0.040	0.024	0.016
	T1	0.050	0.017	0.032
	T2	0.030	0.029	0.001
In good health	T1 & T2	0.693	0.717	-0.023
	T1	0.723	0.724	-0.001
	T2	0.663	0.710	-0.047
College degree	T1 & T2	0.421	0.433	-0.012
	T1	0.396	0.397	-0.001
	T2	0.446	0.464	-0.018
Mid-low income	T1 & T2	0.312	0.307	0.005
	T1	0.277	0.207	0.070
	T2	0.347	0.391	-0.045
Mid-high income	T1 & T2	0.282	0.315	-0.033
	T1	0.347	0.448	-0.102
	T2	0.218	0.203	0.015
High income	T1 & T2	0.139	0.126	0.013
	T1	0.178	0.155	0.023
	T2	0.099	0.101	-0.002
Meeting friends often	T1 & T2	0.743	0.787	-0.045
	T1	0.782	0.828	-0.045
	T2	0.703	0.754	-0.051
Associations membership	T1 & T2	0.450	0.433	0.017
	T1	0.455	0.448	0.007
	T2	0.446	0.420	0.025
From Northern Italy	T1 & T2	0.550	0.543	0.006
	T1	0.584	0.552	0.032
	T2	0.515	0.536	-0.021

Notes: the sample considered includes treatment groups 1 and 2. We report mean values of life satisfaction and the covariates at baseline in the full sample and in the sample of those who do not drop out between phase 1 and phase 2, and the difference in the means (***) $p < 0.01$, ** $p < 0.05$, * $p < 0.1$).

Table 5: Unpacking life satisfaction

	(1)	(2)	(3)	(4)
	Mean	Mean	Variance	Variance
T1 - Information	0.282 (0.221)	0.0594 (0.244)	-0.313 (0.657)	0.0504 (0.654)
T3 - Unpacked	0.627*** (0.203)	0.502** (0.202)	-1.923*** (0.670)	-1.373** (0.607)
Female	-0.00609 (0.157)		0.569 (0.522)	
Age below 30	0.823*** (0.245)		-1.737** (0.774)	
Has a partner	0.165 (0.170)		0.458 (0.578)	
Has children	0.851** (0.343)		-1.189 (1.071)	
In good health	0.960*** (0.189)		-1.646*** (0.552)	
College degree	0.486*** (0.173)		-0.596 (0.555)	
Mid-low income	0.372* (0.209)		-1.588** (0.663)	
Mid-high income	0.583** (0.235)		-0.933 (0.696)	
High income	0.687*** (0.254)		-0.148 (0.795)	
Meeting friends often	0.630*** (0.185)		-1.164** (0.570)	
Associations membership	0.00714 (0.152)		-0.0543 (0.506)	
From Northern Italy	0.00739 (0.172)		-0.611 (0.541)	
Constant	4.353*** (0.469)	7.020*** (0.172)	7.689*** (1.246)	3.000*** (0.462)
Observations	342	342	342	342
R-squared	0.234	0.022	0.104	0.022

Notes: the dependent variable is overall satisfaction with life. Column 1 and 2 report the OLS regression coefficients. Columns 3 and 4 report the RIF regression coefficients for the variance of life satisfaction. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 6: Longitudinal analysis

	(1)	(2)	(3)	(4)
	Mean	Mean	Variance	Variance
Second phase	0.512*** (0.146)	0.512*** (0.143)	-1.786*** (0.573)	-1.786*** (0.591)
Covariates	Yes	No	Yes	No
Observations	254	254	254	254
R-squared	0.210	0.034	0.135	0.035

Notes: the dependent variable is overall satisfaction with life. Columns 1 and 2 report the mean OLS regression coefficient associated with the treatment dummy. Columns 3 and 4 report the RIF regression coefficient for the variance of life satisfaction. The sample considered includes only individuals observed in both phases. The covariates used in columns 1 and 3 are shown in the upper panel of Table 1. A dummy for treatment group 2 is also included. Standard errors clustered at the individual level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 7: Not a re-testing effect?

	(1)	(2)	(3)	(4)
	Mean	Mean	Variance	Variance
T2 - Information	0.215 (0.201)	0.113 (0.193)	0.265 (0.369)	0.404 (0.365)
T3 - Unpacked	-0.036 (0.197)	-0.134 (0.168)	0.187 (0.363)	0.572* (0.320)
Covariates	Yes	No	Yes	No
Observations	267	267	267	267
R-squared	0.170	0.008	0.109	0.012

Notes: the dependent variable is overall satisfaction with life. Column 1 and 2 report the mean OLS regression coefficients associated with the treatment dummies. Columns 3 and 4 report the RIF regression coefficients for the variance of life satisfaction. Covariates included in columns 1 and 3 are shown in the upper panel of Table 1. The sample considered includes only the treatment groups in which domains are elicited. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 8: Overall life satisfaction and satisfaction with domains

	Phase 1	Phase 1	Phase 2	Phase 2	T3	T3
Satisfaction with income	0.026 (0.081)	0.050 (0.104)	0.103*** (0.039)	0.104*** (0.038)	0.118*** (0.036)	0.118*** (0.036)
Satisfaction with family	0.131 (0.081)	0.140* (0.084)	0.159*** (0.039)	0.167*** (0.037)	0.214*** (0.033)	0.214*** (0.033)
Satisfaction with work or study	0.069 (0.099)	0.144 (0.103)	0.107** (0.050)	0.110** (0.047)	0.163*** (0.033)	0.163*** (0.033)
Satisfaction with friends	0.137 (0.103)	0.136 (0.111)	0.149*** (0.053)	0.152*** (0.051)	0.101*** (0.035)	0.101*** (0.035)
Satisfaction with partner	0.124** (0.056)	0.075 (0.060)	0.048* (0.027)	0.046* (0.026)	0.077*** (0.025)	0.077*** (0.025)
Satisfaction with health	0.093 (0.085)	0.074 (0.088)	0.165*** (0.054)	0.162*** (0.053)	0.192*** (0.037)	0.192*** (0.037)
Covariates	Yes	No	Yes	No	Yes	No
Observations	127	127	127	127	140	140
R-squared	0.261	0.174	0.594	0.591	0.675	0.675

Notes: the dependent variable is overall satisfaction with life, and we report mean OLS regression coefficients associated with satisfaction with specific domains. The sample considered includes only individuals who are observed for two phases. Columns 1 and 2 considers outcomes for phase 1, columns 3 and 4 for phase 2, columns 5 and 6 for the third treatment. Covariates included in columns 1 and 3 are age, geographical origin and gender. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 9: Interaction effects

	(1) Life satisfaction
Second phase	2.310*** (0.677)
Second phase * Female	0.289 (0.249)
Second phase * Age below 30	-1.230*** (0.355)
Second phase * Has a partner	0.110 (0.306)
Second phase * Has children	-1.412*** (0.283)
Second phase * In good health	-0.708** (0.344)
Second phase * College degree	0.0923 (0.277)
Second phase * Mid-low income	0.0378 (0.382)
Second phase * Mid-high income	0.142 (0.392)
Second phase * High income	-0.140 (0.518)
Second phase * Meeting friends often	-0.540 (0.383)
Second phase * Associations membership	-0.524** (0.263)
Second phase * From Northern Italy	0.452 (0.315)
Observations	254
R-squared	0.270

Notes: the dependent variable is overall life satisfaction. All covariates for which interaction effects are shown are included linearly as well. A dummy for belonging to treatment group 2 is also included. We consider the longitudinal sample only. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Appendix - not intended for publication

Questionnaire manipulations in the survey experiment

As follows, we report the questions used in the three treatments to elicit satisfaction with life and the six specific domains. The questions were originally written in Italian.

1. No reference to the life domains (T1, Ph. 1)

How satisfied are you with your life in general?

(Very dissatisfied)

1	2	3	4	5	6	7	8	9	10
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 (Very satisfied)

2. Reference to the life domains (T2, Ph. 1)

Research studies have shown that family, friend and sentimental relationships, education or job situation, economic and health conditions represent important determinants of life satisfaction.

How satisfied are you with your life in general?

(Very dissatisfied)

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

 (Very satisfied)

3. Questions of the life domains (T1 and T2, Ph. 2; T3, Ph. 1)

[Subjects were presented with two consecutive and separate screen shots. In the first screen shot, they reported their satisfaction with the six life domains. In the second screen shot, they reported their overall satisfaction with life]

[First screen shot] Research studies have shown that family, friend and sentimental relationships, education or job situation, economic and health conditions represent important determinants of life satisfaction. For each of the following domains, how do you agree with the correspondent statement?

I am satisfied with my economic conditions and my annual income.

(Strongly disagree)

1	2	3	4	5	6	7	8	9	10
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 (Strongly agree)

I am satisfied with my family relationship.

(Strongly disagree)

1	2	3	4	5	6	7	8	9	10
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 (Strongly agree)

I am satisfied with my job (or my student career - if still student).

(Strongly disagree)

1	2	3	4	5	6	7	8	9	10
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 (Strongly agree)

I am satisfied with my friend relationships.

(Strongly disagree)

1	2	3	4	5	6	7	8	9	10
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 (Strongly agree)

I am satisfied with my sentimental relationships.

(Strongly disagree)

1	2	3	4	5	6	7	8	9	10
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 (Strongly agree)

I am satisfied with my health conditions.

(Strongly disagree)

1	2	3	4	5	6	7	8	9	10
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 (Strongly agree)

[Second screen shot] How satisfied are you with your life in general?

(Strongly disagree)

1	2	3	4	5	6	7	8	9	10
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 (Strongly agree)