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Marital Status is Misunderstood in Happiness  
Models

Bruce Chapman and Cahit Guven



# Marital Status is Misunderstood in Happiness Models

Bruce Chapman \*

Australian National University

Cahit Guven †

Deakin University

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## Abstract

One of the most common findings in contemporary empirical social science is that being married is associated with higher measured levels of happiness, or life satisfaction. The result seems to be consistent across both countries and time, and is apparently robust to statistical method, including with respect to econometric specification and fixed effects modeling. Our contribution is to propose that quality of a marriage is likely to be a very important factor in our understanding of the role of marital status, and to conjecture that for some married people being in an alternative state would be conducive to a higher level of happiness. We test this simple idea with conventional OLS modeling using life satisfaction data from three countries, the US, the UK and Germany, and the findings are very clear. We find that the coefficient on the marriage dummy is significant and important with the usual modeling but once marriage quality is controlled for, the effects of being married are extremely different between those in good compared to those in poor marriages. In all three data sets people in self-assessed poor marriages are fairly miserable, and much less happy than unmarried people, and people in self-assessed good marriages are even more happy than the literature reports. We also find that the results differ importantly between women and men, with members of the former sex showing a greater range of responses to marriage quality than do men. A final set of results is that, when marriage quality is controlled for, the apparent marriage effects on other outcome variables, such as self reported health and trust, change significantly.

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\*Australian National University, Crawford School of Economics and Government, Canberra. Email: bruce.chapman@anu.edu.au. The authors thank Alois Stutzer, Paul Frijters, Andrew Leigh, Carol Graham, and Erdal Tekin and participants at the Wellbeing workshop at the University of Wollongong for comments and suggestions.

†Deakin University, Melbourne, Australia, E-mail: cahit.guven@deakin.edu.au.

# 1 Introduction

If being married makes people happy, why is divorce so prevalent? This is the essential enquiry of this paper, motivated by the common-sense notion that some people in poor quality marriages are likely to be very unhappy because of the state of their partnership. A comfortable consensus from the empirical studies is that marriage has a positive and enduring influence on well-being. The usual approach involves using a dummy variable (or variables) for marital status with self-reported happiness or life satisfaction<sup>1</sup> as the dependent variable the result being that the coefficient for the married category is always positive and significant. This interpretation is a consequence of estimation approaches which treat people who are married (or single, or divorced, or widowed) as either being in this state or not being in this state, there being no controls for different levels of marriage quality.

We use the contributions of Ferrer-i-Carbonell and Frijters (2003) who examine a number of methodological issues in the happiness literature, and there are two important results for our current exercise.<sup>2</sup> The first is that using ordinal or cardinal approaches in the estimation of happiness equations results in no differences in practice, and this permits us to employ the simpler approach of OLS compared to ordered probit. Second, they find that while using fixed effects has important consequences for the interpretation of happiness determinants, the strength of the marriage effect is not compromised by controlling for individual time-invariant factors.

Our approach to the issue is purely empirical, using good data from three countries: the US, the UK and Germany. With this range of information we set out to test the

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<sup>1</sup>In the paper we use the terms “happiness” and “life satisfaction” interchangeably. One data set which we know of, the European Social Survey, has measures of both variables; we computed the correlation coefficient between them and found it to be 0.72 (author’s calculations)

<sup>2</sup>Useful recent works by Booth and van Ours (2007) and Booth and van Ours (2008) examine happiness outcomes in the context of family relationships, but are concerned with married couples only.

proposition that self-reported measures of people's satisfaction with their marriages (or married partner, or family) affects their general level of happiness, and perhaps in an important enough way to undermine the consensus concerning the marriage-happiness connection. This is our goal.

Our use of OLS estimation using a standard happiness model with cross-section data means that some of the real econometric concerns associated with this method are not addressed, such as the fundamental selection issues between happiness and marital status, although we control for fixed effects or exploit associated advantages of panel data for Germany and the UK. Overall, we position the analysis squarely in the heart of the usual happiness literature in terms of the dependent variable, control variables and the econometric specifications. We find that the coefficient on the marriage dummy is significant and of the order of 0.251, 0.205 and 0.136 (or about about 8.37, 6.84 and 4.54 percent) for the US, the UK, and Germany using the typical OLS happiness model. However, through the use of categorical approaches with respect to marriage quality, we find very large differences in the happiness effects of being married, with the range of coefficients for these countries in the less parsimonious estimations to be, respectively: -0.476—0.437, -0.547—0.292, and -0.268—0.343 (or about about -15.87—14.57, -18.24—9.74 and -8.94—11.44 percent).

To compensate in part for this simplicity, we offer several extensions. One is to examine the notion that the effect of other variables on happiness changes when our approach to the role of marriage is used, and we find that the measured role of some happiness determinants, such as labor force status, changes importantly once married quality is controlled for. Second is that we test the idea that marriage quality effects on happiness differ between women and men, and the result is fairly clear-cut: women's reported levels of happiness are more conditioned by the quality of their marriage than is the case for men. Third, to encourage much more considered future research on the

determinants of other outcome variables, such as self-reported health and measures of trust, we examine briefly the notion that controlling for marriage quality affects our understanding of the role of marriage on these variables; there is little doubt that this is the case.

## 2 Understanding Our Contribution in the Context of the Literature

### 2.1 The Main Empirical Findings of the Literature

The relationship between marriage and happiness has been studied widely in a range of social science disciplines, with there being a comfortable consensus that marriage has a positive and enduring influence on well-being<sup>3</sup>. Economic theory for this finding is provided in Becker (1973) in which marriage is analysed in the context of the value of role specialization and the gains from trade. From this perspective Becker predicts that gains to a man and woman from marrying depend positively on their human capital and associated relative market wage rates.

Typically empirical studies of the issue report estimations of models using unit record data with measures of life satisfaction as the dependent variable, which is considered to be a function of being married or unmarried, and a host of other independent variables, such as log household income, house ownership, employment status, sex, age, age squared, years of education, log household size, self-reported health, the number of children, religion, and region. In these studies a dummy variable approach is adopted with respect to marital status, sometimes with mutually exclusive multiple sub-categories, such as

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<sup>3</sup>For example, from sociology and demography see Waite (1995), and Waite and Lehrer (2003), and from economics, Frey and Stutzer (2002), Layard (2005) and the papers listed in Table 1. See also Graham (2009) for a summary of findings on marriage and happiness.

being single, widow and divorced. Table 1 provides a short selected summary of the results from papers using approaches such as these.

TABLE 1 HERE.

The important points from the Table 1 are:

(i) The approaches reported use a similar dependent variable, usually self-reported happiness or life satisfaction, and a dummy variable (or variables) for marital status.

(ii) The coefficient for the married category is always positive and statistically significant; and

(iii) The coefficient for the married category varies across studies.

The most sophisticated modeling is to be found in Stutzer and Frey (2006) and Ferrer-i-Carbonell and Frijters (2003). The former analyses the causal relationships between marriage and subjective well-being in a longitudinal data set spanning 17 years, the goal being to separate selection effects from the role of marriage per se. The paper reports that happier singles are more likely to become married and infers from this that there are important selection issues in the conventional approach. However, and a significant finding for our analysis, is that even correcting for this complication as far as they are able to, there are apparently remaining large positive effects from marriage.

The contribution of Ferrer-i-Carbonell and Frijters is to examine a number of methodological issues in the happiness literature, and there are two important results for our current exercise. The first is that using ordinal or cardinal approaches in the estimation of happiness equations results in no differences in practice, and this permits us to employ the simpler approach of OLS compared to ordered probit. Second, they find that while using fixed effects has important consequences for the interpretation of happiness determinants, the strength of the marriage effect is not compromised by controlling for individual time-invariant factors.

On the other hand, Stutzer and Frey (2006) fully shares our argument in their paper

and expresses a similar view based on their analysis of life satisfaction profiles . They find huge differences in how spouses feel in their lives as newly-wed couples (in terms of overall life satisfaction). However, they did not exploit the information on the self rated quality of the relationship. We believe that the systematic and theory based analysis of the heterogeneity in effects on life satisfaction is only at the beginning.

## 2.2 Our Approach in Summary

Essentially the goal is to determine the extent to which conventional empirical approaches calculates the marriage effect on happiness and how much these effects change including the role of marriage quality.<sup>4</sup> The method adopted can be clarified formally through reference to the following. Equation (1) illustrates the usual method, where the dependent variable is the measure of happiness,  $\beta_m$  is the coefficient for marriage dummy.  $\beta_j^S$  are coefficients for other  $T$  control variables (  $x_j$  summed to  $T$ ) in the marriage dummy model.

$$Happiness = \beta_0 + \beta_m X_m + \sum_{j=1}^T \beta_j X_j + \epsilon \quad (1)$$

Our more flexible functional form is given by equation (2), in which  $\gamma_i^S$  are the coefficient for each level of marriage quality, assumed here to number three (to correspond to the empirical analysis, 1=not happily married, 2=pretty happily married, and 3=happily married).

$$Happiness = \beta_0 + \gamma_1 X_1 + \gamma_2 X_2 + \gamma_3 X_3 + \sum_{j=1}^T \beta_j^* X_j + \epsilon \quad (2)$$

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<sup>4</sup>Marriage satisfaction which is the measure of marriage quality in this paper is found to predict divorce (Frijters 2000).

In the situation in which the marriage variables are uncorrelated with other control variables the marriage dummy coefficient from Equation (1) is given by:

$$\beta_m = \bar{\gamma} = \sum_{i=1}^3 \omega_i \gamma_i$$

Where the weight  $\omega_i$  is the proportion of the sample for each level of marriage quality<sup>5</sup>. Allowing for some degree of correlation among the regressors, then the marriage dummy can be approximated by:

$$\beta_m \approx \bar{\gamma} = \sum_{i=1}^3 \omega_i \gamma_i$$

In what follows we are concerned mainly with comparisons of the results of estimations of Equation (1) (with the usual set of right-hand side variables) with the results of various estimations of Equation (2), and use comparable data from the US, the UK and Germany. In the main part of the analysis we seek to determine the role of marriage quality on happiness, with the clear prediction that  $\gamma_1 < \gamma_2 < \gamma_3$ . This part of the exercise allows us to illustrate a new range of marriage effects, and this leads to more disaggregated analyses concerning the effects of different variables on happiness and other differences between people.

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<sup>5</sup>For example, for BHPS, the weight assigned to the first level of marriage happiness is  $\omega_1 = 0.032$ , the proportion of the sample which reports being “not happily married” (see Table 5).



## 3 Data

### 3.1 Life Satisfaction and Marriage Quality in the US, the UK and Germany

#### The US

For the US we have access to cross-sectional General Social Science (GSS) surveys have been conducted by the National Opinion Research Center (NORC) in the United States annually for most years 1972-1994, and biennially beginning in 1994. The main areas covered in the GSS include measures of socioeconomic status, social mobility, social control, family, race relations, sexual relations, civil liberties, and morality. The dependent variable used in our analysis is the response to the question, “Taken all together, how would you say things are these days-would you say that you are very happy, pretty happy, or not too happy?” The response is recoded as a categorical variable taking the values 1, 2, and 3 which in order refer to “not too happy,” “pretty happy,” and “very happy.”<sup>6</sup>. There were insufficient observations in any single year so we pooled the data which produced 23045 observations<sup>7</sup>.

For the US the measure of marriage quality is taken to be respondents’ answers to the following question: “Taking things all together, how would you describe your marriage - would you say that your marriage is very happy, pretty happy, or not too happy?”. The response is recoded as a categorical variable taking the values 1, 2, and 3 which respectively refer to “not too happy,” “pretty happy,” and “very happy.”

In a robustness test we used family satisfaction as another measure of marriage quality which is the response to the question: ”From each area of life I am going to name, tell me the number that shows how much satisfaction you get from that area: your family”,

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<sup>6</sup>We have omitted observations with the responses ”Don’t know”, ”No answer” and ”Not applicable”, of which there were less than 10 per cent.

<sup>7</sup>This is an acceptable procedure given that there are no repeated observations.

with responses measured as: a very great deal (7); a great deal (6); quite a bit (5); a fair amount (4) some (3) a little (2) none (1).”

### **The UK**

The British Household Panel Survey (BHPS) began in 1991 and is a multi-purpose study whose unique value resides in the fact that: it follows the same representative sample of individuals the panel over a period of years; it is household-based, interviewing every adult member of sampled households; it contains sufficient cases for meaningful analysis of certain groups such as the elderly or lone parent families<sup>8</sup>. The wave 1 panel consists of some 5,500 households and 10,300 individuals drawn from 250 areas of Great Britain. Additional samples of 1,500 households in each of Scotland and Wales were added to the main sample in 1999, and in 2001 a sample of 2,000 households was added in Northern Ireland, making the panel suitable for UK-wide research.

BHPS has information in waves 1996-2007 concerning life satisfaction and individual’s satisfaction with his/her partner (if partnered), both of which are measured on a scale from 1 to 7. To be consistent with the US data we recoded the life satisfaction variable into three categories as follows: (1-3) not too happy; (4,5) pretty happy; (6,7) very happy.

We measure marriage quality with the use of the respondent’s satisfaction with his/her partner which is measured from 1 to 7. Again to be consistent with the US data we have recoded this variable into three categories as follows: (1-3) not too happily married; (4,5) pretty happily married; (6,7) very happily married.

### **Germany**

The German Socio-Economic Panel Study (GSOEP) is a wide-ranging representative longitudinal annual collection of data on private households conducted since 1984<sup>9</sup>. The

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<sup>8</sup>For further information on BHPS: <http://www.esds.ac.uk/longitudinal/access/bhps/L33196.asp>

<sup>9</sup>For further information on GSOEP: <http://panel.gsoep.de/soepinfo2007/>

survey includes information on living conditions, place of residence, values, willingness to take risks, socio-economic factors, the changes currently being undergone in various areas of individuals' life, and with respect to the relationships and dependencies among these areas. Life satisfaction is measured as a categorical variable taking values 0-10 (where 0 is totally unhappy and 10 is totally happy) and is available for every year in the survey. To be consistent with the US data we recoded the life satisfaction variable as a three category variable: (0-6) not too happy; (7,8) pretty happy; (9,10) very happy. We used 18,054 observations from the 25th Wave, conducted in 2007.

For the German measure of marriage quality we had available respondents' "satisfaction with family" which takes values from 0 to 10, a variable which exists only for the years 2006 and 2007. Again to be consistent with the US data we recoded this variable as a three category variable: (0-6) not too happily married; (7,8) pretty happily married; (9,10) very happily married.

Figure 1 shows the distribution of the measures of happiness for the US, the UK and Germany, disaggregated by marital status. In all three countries married people are more likely to report themselves as being in the happiest category than unmarried people, although the data are extremely similar for Germany. Also in all three countries, married people are less likely to be in the least happy category, with the German measures again being very similar. These distributions can be converted into means and we find respectively for the three countries that the average measures of happiness for married and unmarried people are: 2.33 and 2.04; 2.30 and 2.13; and 1.85 and 1.81. The simple t-statistics on a test of differences are respectively 47.9, 14.1 and 4.1, meaning that (without controls) married people are happier than unmarried people in all three countries.

### 3.2 Other Descriptive Statistics

Table 2 presents summary statistics of the variables used in the paper, and some features of the data respectively for the US, the UK and Germany are as follows:

TABLE 2 ABOUT HERE.

- (i) The average ages are around 45, 47, and 49 years of age;
- (ii) 63, 76 and 46 per cent of people own their own dwelling;
- (iii) 62, 56 and 61 per cent are employed;
- (iv) 44, 46 and 48 per cent are male;
- (v) The number of years of education are 13, 12 and 12;
- (vi) The unemployment rates are, at 3.0, 2.6 and 4.8 per cent; and
- (vii) The proportions in each sample which are married<sup>10</sup> are 56, 64 and 60 per cent;

The major characteristics of the data sets are fairly similar between the three countries. We now move to the empirical results.

## 4 Major Empirical Results

The major aspect of our enquiry relates to comparisons between estimations of equation (1) and equation (2). Table 3 presents the results for the baseline specifications where the dependent variable is happiness on a scale 1-3. All regressions include religion dummies, region dummies, and, for the US, year dummies (if applicable).

TABLE 3 ABOUT HERE.

The main results respectively for the US, the UK and Germany are as follows:

- (i) The coefficient on the marriage dummy is significant and of the order of 0.251, 0.205 and 0.136. These results mean that being married adds around 10 per cent on

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<sup>10</sup>We define married as a person living with a partner. We separate the effects for legally married and cohabitation samples in the robustness.

average to happiness in the US and the UK, and about 7.5 per cent to happiness in Germany.

(ii) The positive relationship between household incomes and happiness is highly significant, with the results for U.S and the UK being close and the relationship is stronger in Germany;

(iii) Renters are less happier than owners, but the effects of home ownership are quite small;

(iv) Unemployed people are less happier than employed, with the effect being between 7 and 10 per cent and relatively large in the UK;

(v) Being female is associated with higher happiness of the order of 0.04, 0.02 and 0.02, or around 10-15 per cent at the mean;

(vi) The familiar U-shaped age effect on happiness is found for all three countries;

(vii) Education contributes positively to happiness; and

(viii) The relationship between health and happiness is significant in all three countries being the highest in Germany and lowest in the US

The important general result from the estimation of equation (2) concerns the familiarity of broad results in the context of the literature; for example, the happiness associations with household incomes, unemployment, sex and age are typically what is found in studies of this type. This provides us with some confidence that we will be able to generalize the findings to different populations and periods of time.

Estimations of Equation (2) are reported now in Table 4, in which the typical baseline approach to happiness estimation is augmented through the replacement of the marriage dummy with the marriage quality disaggregation.

TABLE 4 ABOUT HERE.

The critical main results of the exercise are summarized in Table 5, which allows a direct comparison of the results of estimation of Equations (1) and (2) in terms of the

marriage/happiness relationship.

TABLE 5 ABOUT HERE.

The comparison of the coefficients from estimations of Equations (1) and (2) offers very instructive reading indeed. The major results are as follows:

(i) For all three countries people who report themselves to be “not too happily married” are significantly less happy than unmarried people;

(ii) The (un)happiness effect of a poor quality marriage is quite large compared to being unmarried, with the coefficients for the US, the UK and Germany respectively being -0.48, -0.55 and -0.27, which in percentage terms (calculated at the mean) are around 22, 27 and 14 per cent;

(iii) The happiness effect of those who report themselves to be “happily married” is very large, with the coefficients for the US, the UK and Germany being 0.44, 0.30 and 0.34. In percentage terms (calculated at the mean) these effects suggest that those in high quality marriages are around 20, 19 and 18 happier relative to the unmarried; and

(iv) While on average there is clearly a positive happiness effect from marriage, there is very obviously a very large range of marriage effects which are determined by the quality of the partnership. In the US, the UK and Germany those with the happiest marriages are roughly 42, 28 and 32 per cent more happy than those with the unhappiest marriages.

The relative sizes of these effects can be illustrated graphically in many different ways. To highlight the dimensions of the differences we chose to use simulations of the happiness/marriage quality relationships by wave for the British panel from 1996 to 2007. These associations are shown in Figure 2.

FIGURE 2 ABOUT HERE.

The important points illustrated from the figures, and shown empirically in Table 5, are:

- (i) There are quite similar differences between the marriage groups in the countries;
- (ii) The ranges of marriage effects on happiness is very large indeed; and
- (iii) Being unmarried is clearly associated with important happiness benefits if the counter-factual is being in a poor quality partnership.

The findings reported in Table 4, and shown strikingly in Figure 2, offer a strong justification for the basic motivation of the paper. There is no doubt that the literature's consensus of a significantly positive marriage effect for happiness is at best an important simplification and people in poor marriages are fairly miserable relative to the unmarried.

The estimations of Equation (1) and Equation (2) reported above provide the opportunity to explore the sensitivity of the measured effects of other happiness determinants. That is, we are able to examine the issue of whether or not the coefficients of important independent variables change when measures of marriage quality are taken into account. Since the goal here is to encourage further work along these lines rather than to provide a comprehensive analysis for all the samples, this exercise has been undertaken only with respect to the US data. Table 6 illustrates the sensitivity of the major coefficients to changes in marriage specifications

TABLE 6 ABOUT HERE.

The main results with respect to changes in the effects of other marriage determinants for the US as a consequence of a different treatment of the role of marriage are as follows:

- (i) There are no important changes in the measured effects on happiness of changes in: household incomes; being a renter; being unemployed; education; household size; having one child instead of no children; and age;
- (ii) The happiness effect of not being in the labor force decreases considerably when marriage quality is controlled for, from 0.028 to 0.017;
- (iii) The happiness effect of self-reported good health increases very significantly, from 0.182 to 0.648;

(iv) The happiness effect of having more than one child, compared to having no children, decreases from -0.072 to -0.058; and

(v) The female happiness premium increases from 0.041 to 0.052<sup>11</sup>.

The results suggest that there is considerably more work to do with other data sets on this issue. They also imply that some of the generally accepted happiness determinants results are open to question, at least in terms of coefficient sizes, and this in turn reinforces the basic notion that modeling happiness with disaggregated measures of marriage quality appears to be a very fruitful journey for research that has just begun.

While we are confident that our approach has great potential, we stress that we have not addressed the econometric concerns of simple happiness cross-sectional modeling and, accordingly, this remains a caveat for interpretation of the overall contribution of the analysis. With these qualifications we now explore several important extensions of our theme.

## 5 Are There Gender Differences?

So far we have focused on our basic concern and have used a restriction typically employed in happiness estimations, which is to constrain relationships to be identical between the sexes. Table 3 reports male and female coefficient sizes for the marriage quality effects on happiness from models which allow flexibility between the sexes in terms of happiness effects.

TABLE 3 ABOUT HERE.

The main results from the estimations with unconstrained sex effects are as follows with respect to all three countries:

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<sup>11</sup>Section 5 illustrates that the gender effect is unlikely to be completely accurately measured with this specification given that there are quite clearly differences between females and males with respect to the impact of marriage quality on happiness.



(i) Both males and females experience negative and statistically significant effects on happiness as a result of being in marriages in which they report themselves to be “not too happily married”;

(ii) Both males and females experience positive and statistically significant effects on happiness as a result of being in marriages which they report themselves to be “happily married”, and in all cases these effects are much higher than the average marriage effects from the baseline model;

(iii) The (un)happiness effects for females as a result of being in marriages which they report to be “not too happily married” are much greater than is the case for males, of the order of 25 per cent<sup>12</sup>; and

(iv) The happiness effects for males and females as a result of being in marriages in which they report to be “happily married” are quite similar.

A broad conclusion from the disaggregated estimation by sex is that the effects of marriage quality are not substantially different between men and women, and that the findings concerning the effects of marriage quality on happiness are not compromised through the use of a more constrained approach by gender. The one notable difference is that women are apparently much more responsive in terms of (un)happiness effects from poor marriages. The evidence from the demographic literature, that marital separation is more likely to be initiated by women, sits comfortably with this result<sup>13</sup>. We illustrate the points in figure 3 which are empirically shown in Table 3.

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<sup>12</sup>This approximation is the result of comparisons between the absolute sizes of the coefficients on the lowest category of marriage quality between males and females for each country.

<sup>13</sup>Senik et al. (2009) use a direct question on separations in HILDA and find that separations are mostly initiated by women. Moreover, women who report to have initiated the separations were actually less happier than their partners.

## 6 Non-Happiness Well-being Outcomes and Marriage Quality

There is a great deal of social sciences research aimed at explaining variations in individual levels of physical and emotional health, of which the happiness literature is a (substantial) subset. Other indicators of well-being include measures of self-reported health, feelings about suicidal, mental and emotional health and levels of interpersonal trust. In what follows we complement our essential contribution through a brief examination of whether or not there are important differences in these outcomes depending on marriage quality.

As very partial background to this we note that several examples of findings of research of this kind. First, the literature has established a positive and significant relationship between being married and good health for both men and women<sup>14</sup>. Second, Kiecolt-Glaser and Newton (2001) find that marriage has indirect positive influences on health outcomes through diminution of depression and lifestyle health risks, and direct positive influences on cardiovascular, endocrine, immune, neuro-sensory, and other physiological mechanisms. Third, married people live longer than unmarried people, a result that Guven and Soloumidies (2009) attribute to the influence on marriage of increased happiness. Finally, Grundy and Sloggett (2003) purport to show that social support related to being married have an important and positive effect on psychological and self-rated health.

This brief background motivates a plethora of different well-being related estimations reported in Table 8. The goal is to enquire as to the possible differences in the role of marriage on non-happiness well-being outcomes, and to ask this role is influenced by marriage quality. The exercise is indicative only, designed to encourage further explorations

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<sup>14</sup>See Ross et al. (1990) for a review.

of these relationships.

Selectively, some of the important findings from Table 8 are as follows, all compared to being unmarried:

(i) In all three countries people in high quality marriages report higher levels of health and interpersonal trust, findings which are summarized more clearly in Appendix Table 12;

(ii) In all three countries people in poor quality marriages report lower levels of health and interpersonal trust;

(iii) In the US, different reasons for suicide - such as bankruptcy - were significantly less likely to be justified in the minds of people in high quality marriages;

(iv) In the UK, high quality marriages were much less likely to be associated with poor measures of health outcomes except migraine; and

(v) In Germany, people in low quality marriages were much more likely to have a high number of doctor visits.

The most important point from the estimations reported in Table 8 is that, as is the case with modeling the happiness-marriage relationship, well-being outcomes differ very significantly depending on the quality of the marriage. Again, we find that interpretation of the influence of marriage is importantly distorted when marriage quality is not accounted for. That is, the range of outcomes within marriage is a critical aspect to our understanding of the alleged benefits to partnership, a point that we believe should be taken up in much more detail with respect to many health and related outcomes.

## 7 Selected Sensitivity Analyses

A range of different sensitivity tests were undertaken with the data, and these are reported in Appendix Tables. In general these exercises illustrate a broad robustness of

general conclusions to specification and measurement. The main findings are:

(i) The use of the original 10 point happiness scale for Germany and 7 point scale for the UK shows that the estimations of both the baseline (Appendix Table 10 ) and disaggregated marriage quality (Appendix Table 11) result in very similar outcomes and since we have repeated observations in the pooled OLS, we cluster standard errors at the person level in these specifications;

(ii) Using all available waves (with year dummies) for the UK (1996-2007) and for Germany (2006-2007) results in the same conclusions, with generally even higher levels of statistical significance (Appendix Table 9);

(iii) Disaggregating measures of marriage quality from three to seven categories for the UK and to ten categories for Germany and using another seven scale marriage quality measure for the US provides very similar findings to the main exercise (Appendix Table 11 and Table 13);

(iv) For the UK, and the US, the use of other indeces constructed on the basis of answers to questions indicating satisfaction with other aspects of married or family life, spouse's satisfaction with partner, and satisfaction measured on difference scales delivers comparable broad conclusions as our use of the marriage quality measures (Table 9); and

(v) Fixed effects modeling with the use of the British and German waves resulted in the same broad conclusions (Table 9).

(vi) Our broad results hold also for the legally married sample as well as cohabitation sample in the UK and Germany. (Table 9).

(vii) Our broad results hold when we use 5 and 11 year lagged interaction in the UK and 1 year lagged interaction in Germany (Table 9).

## 8 Conclusion

There is a very large number of empirical investigations concerning the determinants of happiness and an apparent consensus as to the role of marriage in this context: married people report higher levels of life satisfaction, a finding that apparently transcends data characteristics, country, time, method and econometric sophistication. This pervasive result has motivated the research of the current paper, and it is a finding that we consider to be parsimonious, at best, and in some contexts possibly misleading.

The simple conjecture explored in our exercise is that marriage quality is likely to play a very important role in an understanding of happiness determinants. It might be critical enough to encourage questioning of the notion that being married is generally a better state to be in than being unmarried, and should at least provide a far greater range of life satisfaction outcomes within the broad category of marriage.

To examine this proposition we used data from three countries, the US, the UK and Germany. The data are mostly recent and of a similar form: cross-sectional survey samples on individuals reporting responses to a large number of questions concerning demographic, economic, health and lifestyle issues. We adopt mainstream methods and test the notion that the marriage effect on happiness when it is allowed to vary according to self-reported measures of the quality of the partnership, delivers a different understanding of the role of marriage as measured in categorical terms. For all three countries we find this to be powerfully true. We find that the coefficient on the marriage dummy is significant and of the order of 0.251, 0.205 and 0.136. But, once marriage quality is controlled for, the coefficient for these countries ranges as follows: -0.476—0.437, -0.547—0.292, and -0.268—0.343. In percentage terms these sizes are: -15.87—14.57, -18.24—9.74 and -8.94—11.44 percent.

Specifically, and very unsurprisingly, the general result is that people in poor mar-

riages are far less happy than people in good marriages. Of much more importance for this literature is the clear finding that people in the lowest quality marriages are generally and statistically significantly less happy than those who are unmarried. This result seems to be us to be completely sensible, sitting comfortably in a world in which divorce is commonplace.

When marriage quality is controlled for, a reasonable expectation is that the effect on happiness of other variables changes, and this is the case for our estimations. In particular, the measured role of health and the presence of children are influenced by our innovation, although the relationships with respect to age, education and household income appear to be robust.

The analysis was extended in several ways. One was to allow flexible estimations with respect to women and men, and this revealed that while women still tend to be happier, women respond much more strongly in happiness terms to poor marriages. We also explored briefly the possibility that the apparent marriage effect of other self-reported measures of well-being, such as health and trust, are influenced by the inclusion of marriage quality in typical estimations. While our examination of these matters is only exploratory the results are such as to encourage more flexibly based future analyses in these areas as well.

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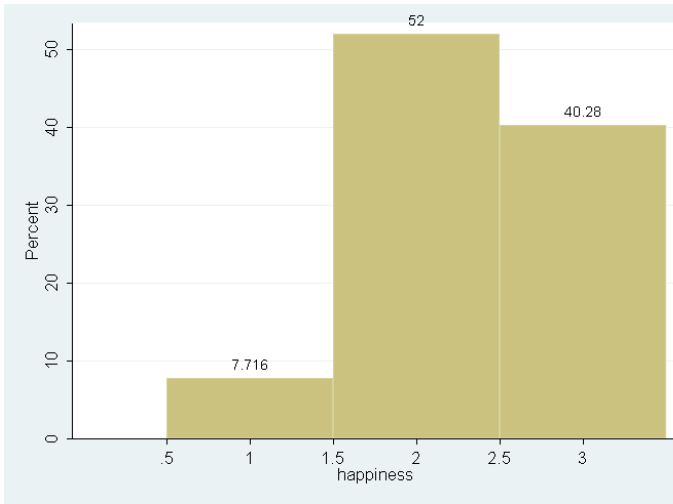
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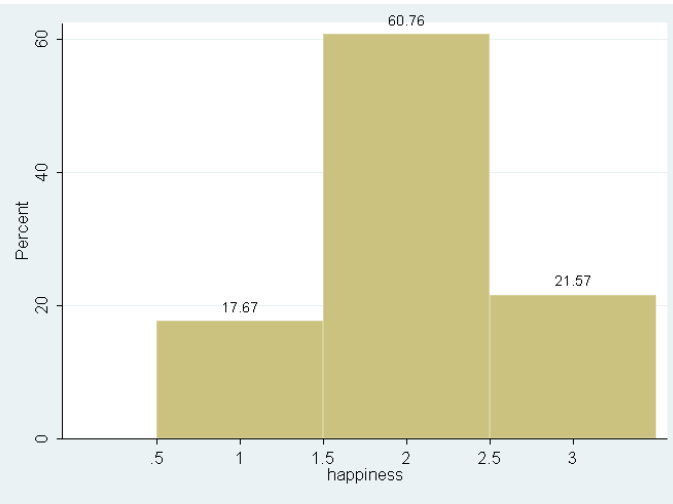
Table 1: Literature Review on the Happiness Effects of Marriage

author	country of data	year	method	happiness scale	coefficient /marginal effect	regression method
Blanchflower and Oswald	U.K	1975-1998	married dummy	1-4	0.41	OLS
Alesina et al.	US	1981-1996	married dummy	1-3	0.31	ordered logit
Alesina et al.	12 European countries	1975-1992	married dummy	1-3	0.29	ordered logit
Clark et al.	Australia	2001	married dummy	0-10	0.31 (men)	ordered logit
Clark et al.	Australia	2001	married dummy	0-10	0.20 (women)	ordered logit
Stutzer and Frey	Germany	1984-2001	married dummy	0-10	0.30	OLS
Dockery	Australia	1997-2002	married dummy	1-4	0.74	random effects logit
Graham et al.	Russia	1995	married dummy	1-5	0.15	ordered logit
Ferrer-i-Carbonell and Frijters	Germany	1984-2001	married dummy	0-10	0.07	FE OLS

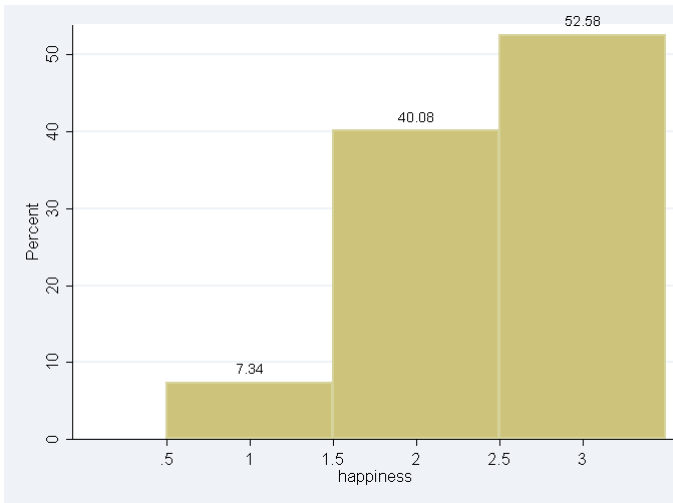
Notes: We present a summary of the findings in the literature. The coefficients are given for OLS and marginal effects for other specifications.



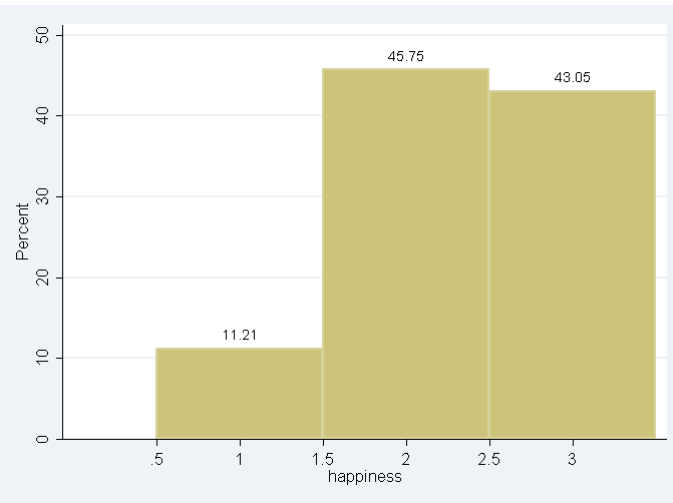
(a) US GSS/married



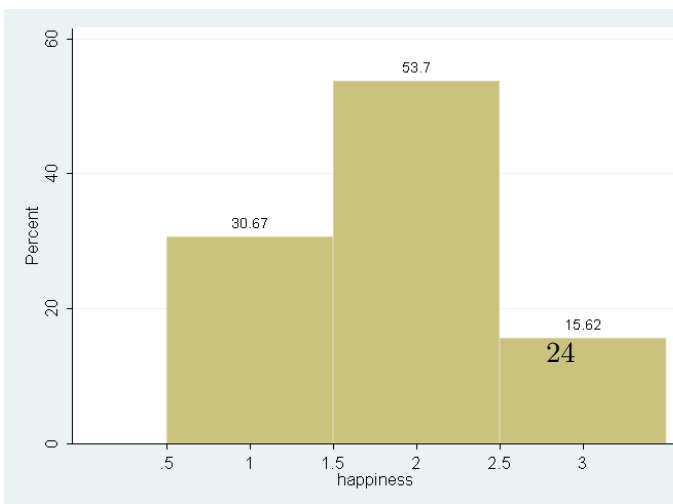
(b) US GSS/unmarried



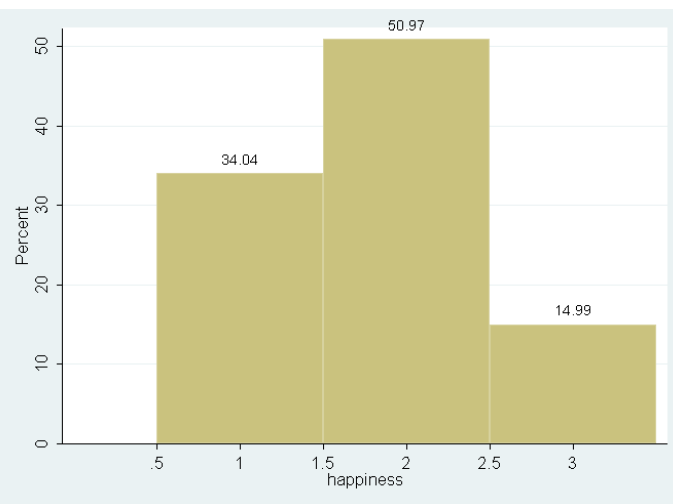
(c) BHPS/married



(d) BHPS/unmarried



(e) GSOEP/married



(f) GSOEP/unmarried

Figure 1: Distribution of happiness by marital status

Table 2: variables' means, proportions, and standard deviations

Variable	mean	stdev	mean	stdev	mean	stdev
	US GSS.		BHPS		GSOEP	
original happiness	2.2	0.63	5.3	1.25	7.0	1.78
recoded happiness	2.2	0.63	2.4	0.64	1.9	0.67
ln household income	9.9	0.98	4.7	1.12	7.9	0.59
age	45.2	17.52	46.5	16.92	48.9	17.50
percent own dwelling	62.8	0.04	75.9	0.04	45.6	0.07
percent rent dwelling	35.0	0.03	24.1	0.03	54.4	0.07
percent other dwelling	2.2	0.01				
percent employed	61.9	0.02	57.5	0.02	60.9	0.02
percent unemployed	3.0	0.01	2.6	0.01	4.8	0.01
percent not in the labor force	35.1	0.02	39.9	0.02	34.4	0.03
percent male	43.9	0.02	45.6	0.02	47.6	0.02
percent female	56.1	0.02	54.4	0.02	52.4	0.02
years of education	12.6	3.2	12.2	2.8	12.2	2.7
percent no children	27.3	0.03	67.0	0.03	70.9	0.03
percent 1 child	16.0	0.02	15.4	0.02	15.1	0.02
percent > 1 children	56.7	0.02	17.5	0.02	14.0	0.02
ln household size	0.9	0.57	0.9	0.53	0.9	0.49
percent married	55.5	0.02	64.0	0.02	60.0	0.02
percent unmarried	45.5	0.02	36.0	0.02	40.0	0.02
self-reported health	3.0	0.85	3.8	0.94	3.4	0.95
happiness with:						
marriage	2.6	0.54				
recoded satisfaction with:						
partner			2.8	0.46		
recoded satisfaction with:						
family					2.2	0.75

*Notes:* This table shows the summary statistics of the variables. Means are reported for the continuous variables and proportions (for instance, 61.9 equals to the number of people who are employed divided by the sum of people who are employed, unemployed, and not in the labor force.) are reported for categorical variables. Original happiness takes values 0-10 for GSOEP and 1-7 for BHPS. Recoded happiness takes values 1-3 for GSOEP and BHPS which is recoded from the original form as follows: GSOEP- (0-6) not too happy; (7,8) pretty happy; (9,10) very happy and BHPS-(1-3) not too happy; (4,5) pretty happy; (6,7) very happy. For the US GSS, original happiness and recoded happiness is the same and is on a scale 1-3 where: (1) not too happy; (2) pretty happy; (3) very happy. Unmarried includes separated, divorced, widowed, and single people. The numbers are for all the waves of the US GSS from 1974 to 2004, for the wave (2007) of BHPS and for the 25<sup>th</sup> wave (2007) of GSOEP. Satisfaction with partner (BHPS) and satisfaction with family (GSOEP) is recoded from the original form as follows: BHPS-(1-3) not too happily married; (4,5) pretty happily married; (6,7) very happily married. GSOEP- (0-6) not too happily married; (7,8) pretty happily married; (9,10) very happily married. For the GSS, happiness with marriage is on a scale 1-3 where: (1) not too happily married; (2) pretty happily married; (3) very happily married.

Table 3: **Baseline Regressions**

Dependent Variable: Self-reported Happiness

OLS			
	US GSS.	BHPS	GSOEP
married	0.251 (31.5)	0.205 (14.7)	0.136 (10.7)
unmarried (omitted)			
ln household income	0.049 (8.4)	0.023 (2.7)	0.182 (17.4)
own dwelling (omitted)			
rent dwelling	-0.016 (1.7)	-0.089 (6.6)	-0.044 (4.5)
employed (omitted)			
unemployed	-0.178 (7.1)	-0.182 (5.2)	-0.156 (7.3)
not in the labor force	0.028 (3.6)	0.036 (2.5)	0.048 (3.8)
male (omitted)			
female	0.041 (5.7)	0.016 (1.6)	0.024 (2.7)
age	-0.006 (4.3)	-0.022 (12.0)	-0.018 (10.4)
age square*100	0.009 (6.5)	0.023 (13.1)	0.018 (11.1)
years of education	0.006 (7.6)	0.002 (0.7)	0.013 (6.9)
ln household size	-0.001 (0.4)	-0.051 (2.9)	-0.156 (9.6)
self-reported health	0.182 (147.8)	0.239 (40.1)	0.279 (55.2)
no children (omitted)			
one child	-0.080 (7.3)	-0.023 (1.4)	0.044 (3.0)
more than one child	-0.072 (9.2)	-0.033 (1.8)	0.079 (4.7)
religion dummies	yes	yes	yes
region dummies	yes	yes	yes
year dummies	yes	no	no
Adjusted R-squared	0.128	0.154	0.241
Number of observations	43317	12956	18054

*Notes:* The dependent variable is on a scale from 1 to 3. Original happiness takes values 0-10 for GSOEP and 1-7 for BHPS. Recoded happiness takes values 1-3 for GSOEP and BHPS which is recoded from the original form as follows: GSOEP- (0-6) not too happy; (7,8) pretty happy; (9,10) very happy and BHPS-(1-3) not too happy; (4,5) pretty happy; (6,7) very happy. For the GSS, happiness is on a scale 1-3 where: (1) not too happy; (2) pretty happy; (3) very happy. Not married includes separated, divorced, widowed, and single people. We present coefficients in all regressions together with the *t*-statistics in parenthesis. The first column is estimated for all the waves of the GSS from 1974 to 2004. The second column is estimated only for the wave (2007) of BHPS. The third column is estimated only for the 25<sup>th</sup> wave (2007) of GSOEP.

Table 4: **Marriage Quality**

Dependent Variable: Self-reported Happiness

OLS			
	US GSS	BHPS	GSOEP
not too happily married	-0.476 (16.3)	-0.547 (14.7)	-0.268 (15.8)
pretty happily married	-0.041 (2.6)	-0.177 (8.4)	0.037 (2.8)
happily married	0.437 (41.2)	0.292 (21.3)	0.343 (26.0)
not married (omitted)			
ln household income	0.045 (7.6)	0.021 (2.5)	0.187 (18.0)
rent dwelling	-0.017 (1.9)	-0.070 (5.4)	-0.051 (5.5)
unemployed	-0.176 (6.7)	-0.162 (4.9)	-0.159 (7.8)
not in the labor force	0.017 (2.3)	0.036 (2.6)	0.030 (2.5)
female	0.052 (7.6)	0.032 (3.1)	0.030 (3.5)
age	-0.004 (3.8)	-0.019 (11.4)	-0.017 (10.6)
age square*100	0.007 (5.8)	0.002 (12.7)	0.002 (12.7)
years of education	0.004 (5.8)	0.003 (1.2)	0.011 (16.1)
ln household size	0.012 (1.8)	-0.024 (1.4)	-0.163 (10.3)
self-reported health	0.648 (50.8)	0.223 (38.7)	0.241 (49.9)
no children (omitted)			
one child	-0.067 (6.0)	-0.017 (1.0)	0.046 (3.3)
more than one child	-0.058 (6.6)	-0.024 (1.3)	0.088 (5.5)
religion dummies	yes	yes	yes
region dummies	yes	yes	yes
year dummies	yes	no	no
Adjusted R-squared	0.213	0.224	0.318
Number of observations	43317	12956	18054

*Notes:* The dependent variable is on a scale from 1 to 3. Original happiness takes values 0-10 for GSOEP and 1-7 for BHPS. Recoded happiness takes values 1-3 for GSOEP and BHPS which is recoded from the original form as follows: GSOEP- (0-6) not too happy; (7,8) pretty happy; (9,10) very happy and BHPS-(1-3) not too happy; (4,5) pretty happy; (6,7) very happy. For the GSS, happiness is on a scale 1-3 where: (1) not too happy; (2) pretty happy; (3) very happy. Not married includes separated, divorced, widowed, and single people. We present coefficients in all regressions together with the *t*-statistics in parenthesis. The first column is estimated for all the waves of the GSS from 1974 to 2004. The second column is estimated only for the wave (2007) of BHPS. The third column is estimated only for the 25<sup>th</sup> wave (2007) of GSOEP. Unmarried includes separated, divorced, widowed, and single people. Satisfaction with partner (BHPS) and satisfaction with family (GSOEP) is recoded from the original form as follows: BHPS-(1-3) not too happily married; (4,5) pretty happily married; (6,7) very happily married. GSOEP-(0-6) not too happily married; (7,8) pretty happily married; (9,10) very happily married. For the GSS, happiness with marriage is on a scale 1-3 where: (1) not too happily married; (2) pretty happily married; (3) very happily married.

Table 5: How much our specification changes the relationship between marriage and happiness?

Country	baseline specification	including marriage quality specification		
	$\beta_{married}$	$\gamma_1$	$\gamma_2$	$\gamma_3$
US GSS.	0.251	-0.476 (0.030)	0.041 (0.333)	0.437 (0.637)
BHPS	0.205	-0.547 (0.032)	-0.177 (0.140)	0.292 (0.829)
GSOEP	0.136	-0.268 (0.162)	0.037 (0.425)	0.343 (0.423)

*Notes:* Values in the brackets are weights for each group. Baseline specification is the same as in table 3. Interaction with marriage quality specification is the same as in table 4. The dependent variable is on a scale from 1 to 3. All regressions include the same controls as the baseline regressions as in table 3.

Table 6: **How much our specification changes the relationship between happiness and other controls?**

variables	baseline specification		including marriage quality specification	
	coefficient	<i>t</i>	coefficient	<i>t</i>
ln household income	no change			
rent dwelling	no change			
unemployed	no change			
not in the labor force	0.028	3.6	0.017	2.3
years of education	no change			
ln household size	no change			
self-reported health	0.182	147.80	0.648	50.8
one child	no change			
more than one child	-0.072	9.2	-0.058	6.6
female	0.041	5.70	0.052	7.6
age	no change			

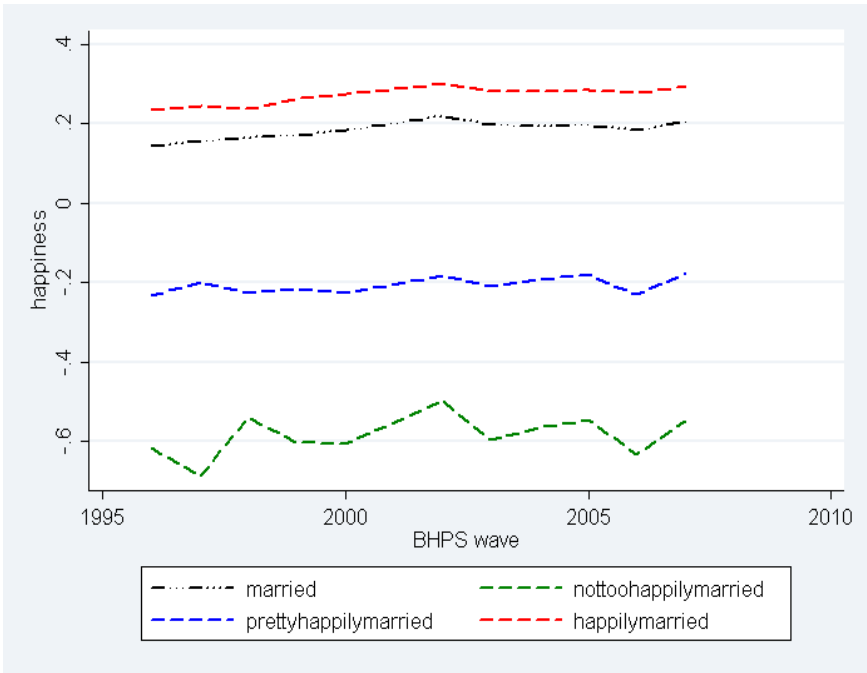
*Notes:* We give a summary of the results for the control variables. If the coefficients on a variables does not statistically differ across specifications, we name it as no change. Otherwise we present the coefficients only for the US for simplicity.

Table 7: Gender Differences

		Dependent Variable: Self-reported Happiness			
		baseline specification		including marriage quality specification	
		married dummy	not too happily married	pretty happily married	happily married
US GSS:					
male		0.259 (22.1)	-0.439 (11.8)	-0.038 (2.8)	0.429 (35.9)
female		0.241 (10.0)	-0.549 (8.8)	-0.073 (6.1)	0.463 (44.8)
BHPS:					
male		0.172 (7.8)	-0.623 (10.5)	-0.193 (5.9)	0.238 (11.1)
female		0.220 (11.9)	-0.507 (10.6)	-0.178 (6.5)	0.324 (17.9)
GSOEP:					
male		0.082 (4.9)	-0.221 (8.8)	0.047 (2.3)	0.359 (17.8)
female		0.085 (5.2)	-0.279 (19.2)	0.042 (2.3)	0.341 (18.9)

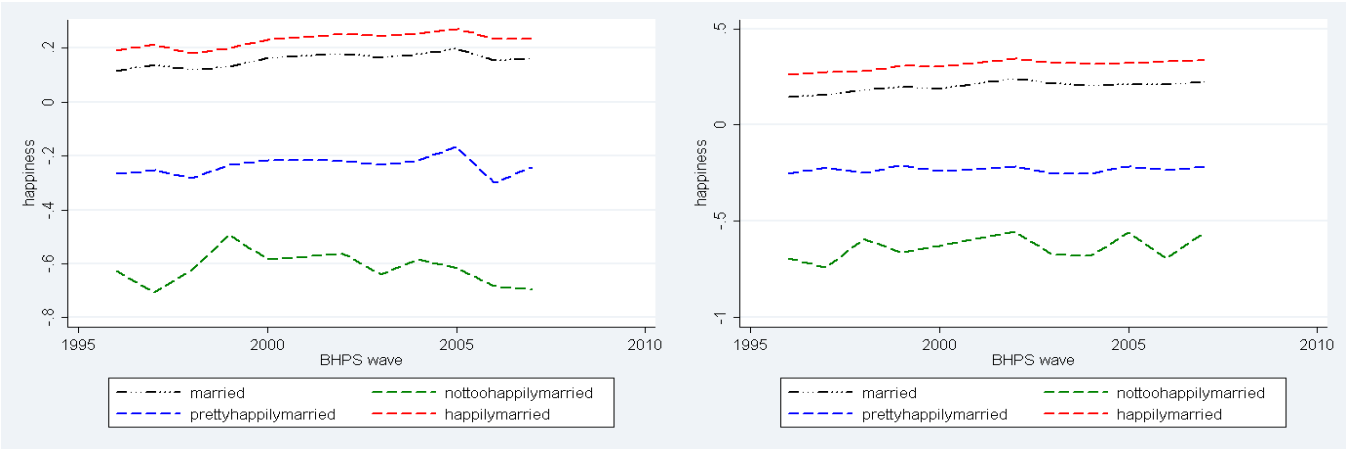
*Notes:* Each row corresponds to a different regression with the corresponding gender sample and country. Baseline specification is the same as in table 3 for gender subsamples. Interaction with marriage quality specification is the same as in table 4 for gender subsamples. The dependent variable is on a scale from 1 to 3. We present coefficients in all regressions together with the  $t$ -statistics in parenthesis. All regressions include the same controls as the baseline regressions as in table 3.





(a) BHPS

Figure 2: Interaction effects



(a) BHPS/men

(b) BHPS/women

Figure 3: Interaction effects by gender in BHPS

Table 8: Non-Happiness Well-being Outcomes and the Role of Marriage Quality

	baseline specification		including marriage quality specification	
	married dummy	not too happily married	pretty happily married	happily married
<b>US GSS.</b>				
(1) subjective health	0.065 (6.2)	-0.217 (6.2)	-0.067 (5.0)	0.144 (12.6)
(2) trust	0.006 (0.5)	-0.139 (3.1)	-0.028 (1.6)	0.023 (1.6)
Suicide if				
(3) incurable disease	-0.029 (3.4)	0.013 (0.4)	0.009 (0.9)	-0.051 (5.5)
(4) bankrupt	-0.010 (2.5)	0.023 (1.9)	-0.007 (1.4)	-0.013 (3.1)
(5) dishonored family	-0.011 (2.9)	0.024 (2.0)	-0.009 (1.8)	-0.014 (3.2)
(6) tired of living	-0.021 (3.7)	0.040 (2.2)	-0.013 (1.9)	-0.030 (4.9)
<b>BHPS:</b>				
(7) subjective health	0.002 (0.1)	-0.271 (4.8)	-0.178 (5.6)	0.040 (1.9)
(8) trust	-0.006 (0.3)	-0.187 (3.1)	-0.107 (3.1)	0.002 (0.8)
(9) high blood pressure	-0.002 (0.2)	0.036 (1.6)	0.030 (2.3)	-0.005 (0.6)
(10) cancer	0.002 (1.3)	0.011 (2.0)	0.001 (0.4)	0.002 (1.3)
(11) diabetes	-0.011 (2.6)	0.005 (0.5)	-0.004 (0.7)	-0.011 (2.7)
(12) epilepsy	-0.002 (1.3)	-0.001 (0.3)	-0.001 (0.5)	-0.002 (1.7)
(13) migraine	0.013 (2.4)	0.010 (0.9)	0.021 (2.2)	0.012 (2.1)
(14) alcohol and drugs	-0.001 (1.2)	0.002 (1.5)	-0.001 (0.7)	-0.002 (2.4)
(15) cigarettes per day	-1.338 (3.7)	0.167 (0.2)	-1.235 (2.1)	-1.535 (4.0)
(16) concentration	0.003 (0.2)	-0.209 (6.0)	-0.062 (3.2)	0.021 (1.6)
(17) loss of sleep	-0.046 (2.7)	0.344 (7.1)	0.123 (4.5)	-0.086 (4.9)
(18) depressed	-0.101 (5.4)	0.554 (10.7)	0.172 (5.9)	-0.164 (8.6)
<b>GSOEP:</b>				
(19) subjective health	0.003 (0.1)	-0.326 (12.9)	-0.067 (3.3)	0.163 (8.1)
(20) annual doctor visits	0.189 (0.6)	2.214 (5.0)	0.302 (0.9)	0.131 (0.4)
(21) trust	0.040 (2.7)	-0.088 (4.1)	-0.032 (2.1)	0.009 (0.5)

Notes: Each row corresponds to a different regression with the corresponding outcome variables. Baseline specification is the same as in table 3 for different dependent variables and interaction with marriage quality specification is the same as in table 4 for different dependent variables. (3)-(6), (8), (9)-(14) are estimated with probit and marginal effects are presented and OLS is used in all other specifications and we present coefficients together with the  $t$ -statistics in parenthesis. All regressions include the same controls as the baseline regressions as in table 3. All dependent variables are defined in the appendix.

Table 9: **Robustness checks**

	Dependent Variable: Self-reported Happiness			
	baseline specification married dummy	not too happily married	including marriage pretty happily married	quality specification happily married
<b>BHPS:</b>				
pooled OLS (1996-2007)	0.185 (40.9)	-0.577 (49.3)	-0.206 (30.1)	0.270 (61.3)
OLS FE	0.108 (14.6)	-0.405 (31.5)	-0.078 (8.6)	0.205 (27.2)
total satisfaction 1-4 (2007)	0.042 (3.2)	-0.317 (8.6)	-0.052 (2.5)	0.065 (4.8)
total satisfaction compared to last year 1-3 (2007)	0.038 (2.0)	-0.075 (1.5)	-0.065 (2.2)	0.048 (2.5)
5 year lagged interaction (2007)	0.097 (6.1)	-0.338 (8.3)	-0.136 (5.5)	0.151 (9.3)
11 year lagged interaction (2007)	0.020 (0.9)	-0.158 (3.2)	-0.195 (5.7)	0.076 (3.4)
spouse's satisfaction with partner (2007) as marriage quality	0.205 (14.7)	-0.174 (4.2)	-0.028 (1.4)	0.184 (14.1)
legally married sample (2007)	0.161 (11.6)	-0.636 (15.2)	-0.229 (10.1)	0.250 (18.3)
cohabitation sample (2007)	0.164 (8.3)	-0.392 (4.9)	-0.162 (4.0)	0.258 (12.3)
<b>GSOEP:</b>				
pooled OLS (2006-2007)	0.136 (15.4)	-0.256 (21.8)	0.040 (4.3)	0.273 (36.7)
OLS FE	0.068 (1.9)	-0.094 (2.6)	0.069 (2.0)	0.182 (5.1)
1 year lagged interaction (2007)	0.136 (10.7)	-0.211 (12.3)	0.004 (0.3)	0.253 (18.6)
spouse's satisfaction with family (2007) as marriage quality	0.136 (10.7)	-0.194 (11.7)	0.044 (3.4)	0.260 (20.5)
legally married sample (2007)	0.084 (7.0)	-0.323 (18.8)	-0.011 (0.8)	0.298 (23.1)
cohabitation sample (2007)	0.136 (7.5)	-0.158 (4.7)	0.054 (2.3)	0.342 (14.1)

*Notes:* Each row corresponds to a different regression with the corresponding sample and country. Baseline specification is the same as in table 3 for gender subsamples. Interaction with marriage quality specification is the same as in table 4. The dependent variable is on a scale from 1 to 3. We present coefficients in all regressions together with the *t*-statistics in parenthesis. All regressions include the same controls as the baseline regressions as in table 3 and pooled regressions include year fixed effects as well. We use total satisfaction on a scale 1-4 and total satisfaction compared to last year on a scale 1-3 as the dependent variables for BHPS in the third and fourth specifications.

## APPENDIX: DEPENDENT VARIABLES USED IN TABLE 8

- (1) Would you say your own health, in general, is: 4 Excellent 3 Good 2 Fair 1 Poor.
- (2) Generally speaking, would you say that most people can be trusted or you can't be too careful in life. 3 Most people can be trusted 2 Depends 1 Can't be too careful.
- (3)-(6) Do you think a person has the right to end his or her own life if this person: A) has an incurable disease B) has gone bankrupt C) has dishonored his or her family D) is tired of living and is ready to die. 1 Yes 0 No.
- (7) Please think back over the last 12 months about how your health has been. Compared to people of your own age, would you say that your health has on the whole been? 5 Excellent 4 good 3 fair 2 poor 1 very poor.
- (8) do you agree or disagree with the following statements? Generally speaking, most people can be trusted: 1 yes 7 no.
- (9)-(14) Do you have any of the health problems or disabilities listed on this card? You can just tell me which numbers apply. exclude temporary conditions? Heart/high blood pressure or blood circulation problems Diabetes, Alcohol or drug related problems, Epilepsy , Migraine or frequent headaches, Cancer, Alcohol and drugs.
- (15) Approximately how many cigarettes a day do you usually smoke, including those you roll yourself?
- (16)-(18) Please think back over the last 12 months about how your health has been. would you say that .... has on the whole been? 4 better than usual. 3. same as usual 2. less than usual 1. much less than usual
- (19) How would you describe your current health? 5 Very good 4 Good 3 Satisfactory 2 Poor 1 Bad.
- (20) Number of annual doctor visits (derived)
- (21) On the whole one can trust people? 4 Totally agree 3 Agree slightly 2 Disagree slightly 1 Totally disagree.

## VARIABLES USED IN THE PAPER FROM THE US GSS:

Self-reported happiness: The answer to the question 157 in the 2004 GSS codebook: “Taken all together, how would you say things are these days—would you say that you are very happy, pretty happy, or not too happy?” Answer: not too happy (1), pretty happy (2), very happy (3), don’t know (missing), no answer (missing), not applicable (missing).

Household income: 1) We created a continuous family income variable using the mid-point method to the the answer to the question 37 in the 2004 GSS codebook: “In which of these groups did you total family income, from all sources, fall last year before taxes, that is? Just tell me the letter.” Answer: Under 1000 (1), 1000-2999 (2), 3000-3999 (3), 4000-4999 (4), 5000-5999 (5), 6000-6999 (6), 7000-7999 (7), 8000-8999 (8), 10000-14999 (9), 15000-19999 (10), 20000-24999 (11), 25000 and over (12), refused (missing), don’t know (missing), no answer (missing), not applicable (missing). 2) GSS generated, variable number 1437 in the 2004 GSS codebook, family income on 1972-2004 surveys in constant dollars (base 1986)

Health status: The answer to the question 159 in the 2004 GSS codebook: “Would you say your own health, in general, is excellent, good, fair, or poor?” Answer: Excellent (4), good (3), fair (2), poor (1), don’t know (missing), no answer (missing), not applicable (missing).

Marital status: The answer to the question 4 in the 2004 GSS codebook: “Are you currently—married, widowed, divorced, separated, or have you never been married?” Answer: married (1), widowed (2), divorced (3), separated (4), never married (5), no answer (missing). We recode this variable as follows: married=1, and not married=2, 3, 4, 5.

Labor force status: The answer to the question 1 in the 2004 GSS codebook: “Last week were you working full-time, part-time, going to school, keeping house, or what?” Answer: working full-time (1), working part-time (2), with a job, but not at work because of temporary illness, vacation, strike (3), unemployed, laid off, looking for work (4), retired (5), in school (6), keeping house (7), other (8), no answer (missing). We recode this variable as follows: employed=1, 2, 3 unemployed=4, and not in the labor force=5, 6, 7, 8.

Working hours: The answer to the question 1-A in the 2004 GSS codebook: “If working full or part-time: How many hours did you work last week, at all jobs? ” Answer is the number of hours, no answer (missing), not applicable (missing).

Sex: The answer to the question 23 in the 2004 GSS codebook: Coded by the interviewer, male (1), female (2).

Race: The answer to the question 24 in the 2004 GSS codebook: “What race do you consider yourself?” Answer: white (1), black (2), other (3) not applicable (missing).

Education: The answer to the question 15 in the 2004 GSS codebook: Coded as the number of years of schooling (maximum is 20) and don’t know (missing), no answer (missing).

Children: The answer to the question 12 in the 2004 GSS codebook: ‘How many children have you ever had? Please count all that were born alive at any time (including any had from a previous marriage)’ Answer: 0, 1, 2, 3, 4, 5, 6, 7, 8 or more, don’t know (missing), no answer (missing).

Age: The answer to the question 13 in the 2004 GSS codebook: Coded as the number of years from birth, don’t know (missing), no answer (missing).

Household size: The answer to the question 34 in the 2004 GSS codebook: Coded as the number of household members (1-16), no answer (missing).

Region: The region of interview, question 51 in the 2004 GSS codebook: New England (1), Middle Atlantic (2), East North Central (3), West North Central (4), South Atlantic (5), East South Central (6), West South Central (7), Mountain (8), Pacific (9). (See Question 26 in the 2004 GSS codebook for a listing of the states within regions.)

Dwelling own: The answers to the question 1471 in the 2004 GSS codebook: “(Do you/does your family) own your (home/apartment), pay rent, or what?” Answer: own or is buying (1), pays rent (2), other (3), don’t know (missing), no answer (missing), not applicable (missing).

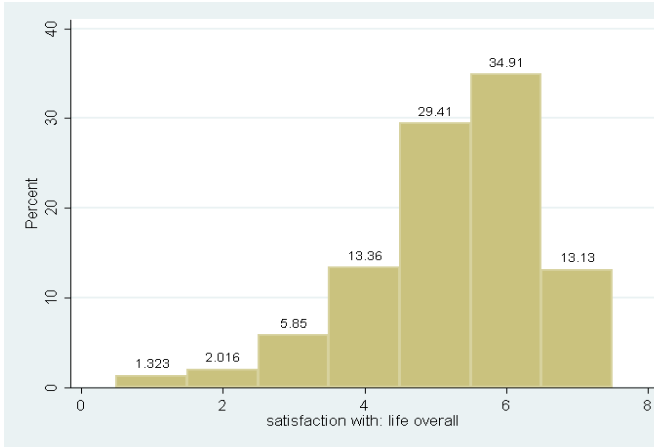
Religion: The answer to the question 104 in the 2004 GSS codebook: “What is your religious preference? Is it Protestant, Catholic, Jewish, some other religion, or no religion?” Answer: Protestant (1), Catholic (2), Jewish (3), none (4), other denominations (5), Buddhism (6), Hinduism (7), other Eastern (8), Moslem/Islam (9), Orthodox-Christian (10), Christian (11), Native American (12), Inter-Nondenominational (13), don’t know (missing), no answer (missing).

Other satisfaction variables: Marriage: the answer to the question 158 “Taking things all together, how would you describe your marriage? Would you say that your marriage is very happy, pretty happy, or not too happy?” Answer: not too happy (1), pretty happy (2), very happy (3), don’t know (missing), no answer (missing), not applicable (missing). The answers to the questions 164 in the 2004 GSS codebook: “For each area of life I am going to name, tell me the number that shows how much satisfaction you get from that area. C) Your family life Answer: None (1), a little (2), some (3), a fair amount (4), quite a bit (5), a great deal (6), a very great deal (7), don’t know (missing), no answer (missing), not applicable (missing).

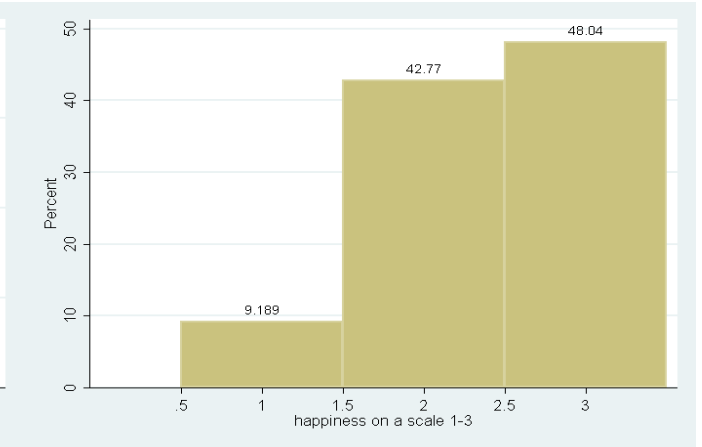
Reference for the variables and the explanations:

**Webpage:** 1972-2004 GSS Codebook

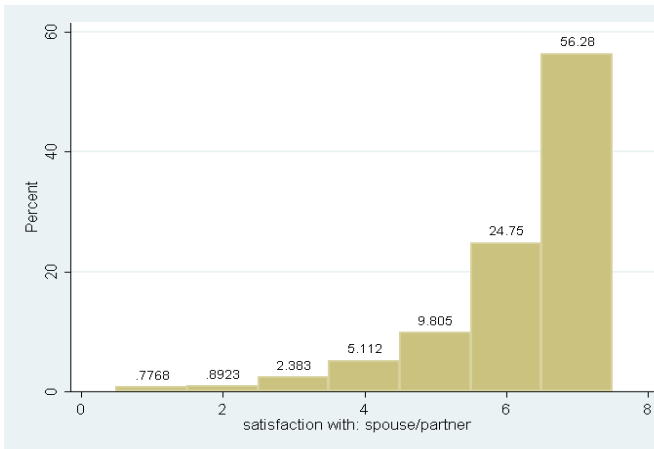
**Webpage:** 1972-2004 GSS Appendix



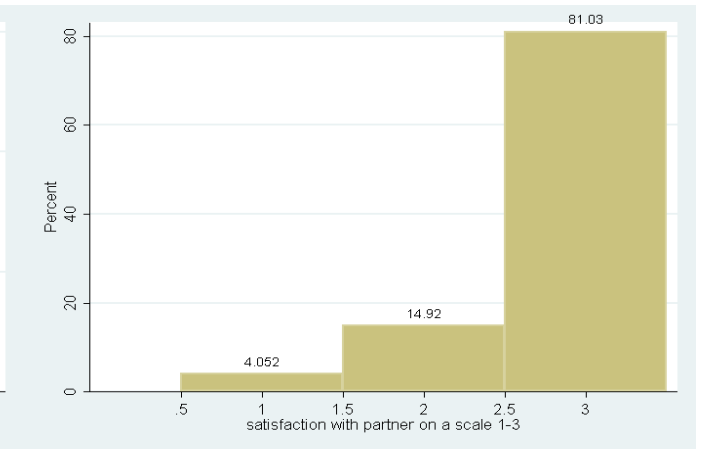
(a)



(b)



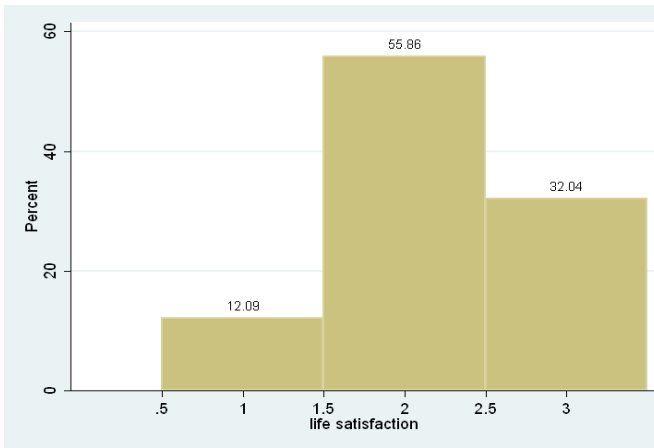
(c)



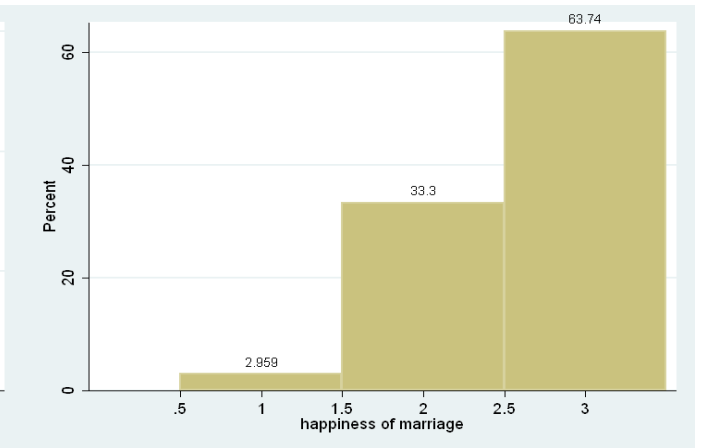
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Figure 4: Distribution of the main variables in BHPS wave 2007



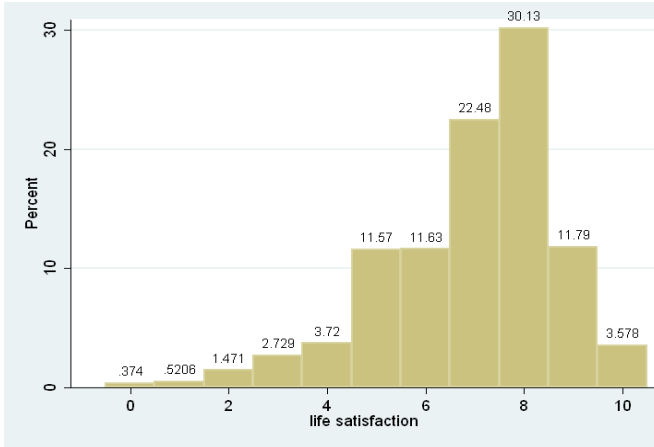


(a) US GSS

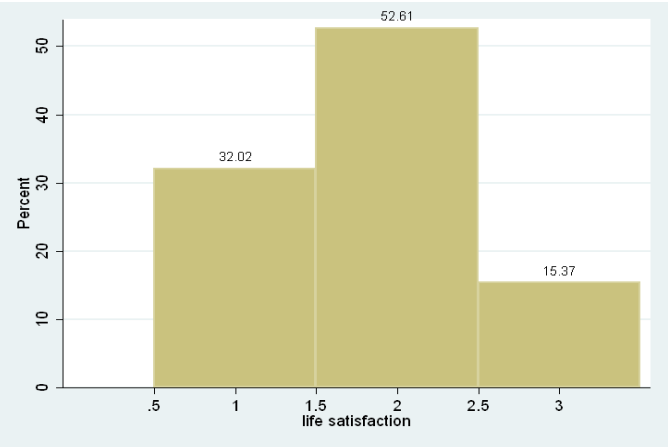


(b) US GSS

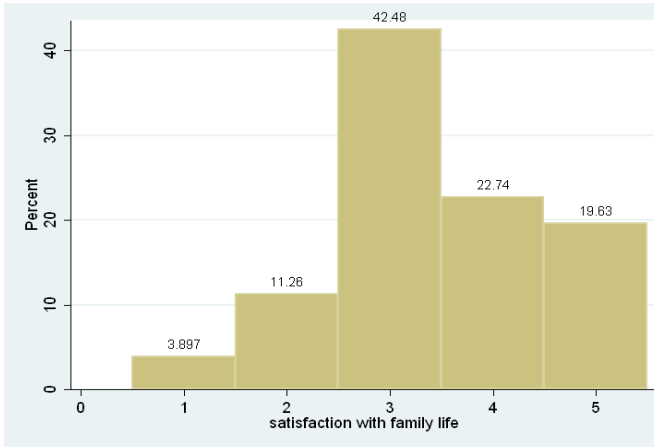
Figure 5: Distribution of the main variables in the US GSS



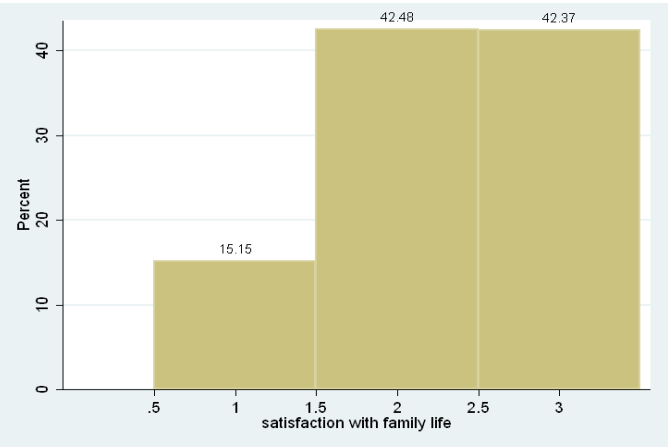
(a)



(b)



(c)



(d)

Figure 6: Distribution of the main variables in GSOEP wave 2007

Table 10: **Baseline Regressions**

Dependent Variable: Self-reported Happiness

OLS		
	BHPS	GSOEP
married	0.388 (14.5)	0.265 (8.5)
not married (omitted)		
ln household income	0.044 (2.6)	0.553 (19.7)
rent dwelling	-0.188 (7.2)	-0.132 (5.3)
unemployed	-0.375 (5.6)	-0.593 (10.7)
not in the labor force	0.020 (0.8)	0.104 (3.2)
female	0.027 (1.3)	0.091 (4.0)
age	-0.047 (14.3)	-0.051 (12.6)
age square*100	0.052 (15.6)	0.056 (13.1)
years of education	-0.012 (2.8)	0.014 (3.0)
ln household size	-0.107 (3.3)	-0.543 (12.6)
self-reported health	0.489 (42.8)	0.855 (65.1)
no children (omitted)		
one child	-0.051 (1.6)	0.127 (3.4)
more than one child	-0.060 (1.7)	0.293 (6.8)
religion dummies	yes	yes
region dummies	yes	yes
year dummies	no	no
Adjusted R-squared	0.172	0.291
Number of observations	12956	18054

*Notes:* The dependent variable is on a scale from 0 to 10 for GSOEP and 1-7 for BHPS. We present coefficients in all regressions together with the  $t$ -statistics in parenthesis. First column is estimated only for the wave 2007 of BHPS. The second column is estimated only for the 25<sup>th</sup> wave (2007) of GSOEP.

Table 11: **Marriage Quality**

Dependent Variable: Self-reported Happiness

OLS		
	BHPS	GSOEP
(0) very unhappily married		-1.708 (11.3)
(1)	-1.618 (9.1)	-1.540 (9.4)
(2)	-1.625 (11.5)	-1.377 (11.1)
(3)	-0.855 (9.9)	-1.277 (11.7)
(4)	-0.655 (10.9)	-0.958 (9.0)
(5)	-0.169 (3.7)	-0.722 (8.0)
(6)	0.229 (6.9)	-0.288 (3.2)
(7)	0.668 (25.0)	0.015 (0.2)
(8)		0.430 (5.1)
(9)		0.832 (9.7)
(10) very happily married		1.076 (12.5)
controls	yes	yes
Adjusted R-squared	0.256	0.408
Number of observations	12956	18054

*Notes:* The dependent variable is on a scale from 0 to 10 for GSOEP and 1-7 for BHPS. We use satisfaction with partner from BHPS (1-7) and satisfaction with family from GSOEP (0-10) as the measures of marriage quality. We present coefficients in all regressions together with the  $t$ -statistics in parenthesis. First column is estimated only for the wave (2007) of BHPS. The second column is estimated only for the 25<sup>th</sup> wave (2007) of GSOEP.

Table 12: Our specification and other outcome variables

Country	outcome variable	baseline specification		including marriage quality specification		
		$\beta_{married}$		$\gamma_1$	$\gamma_2$	
US GSS.	self-reported health	0.065		-0.217 (0.125)	-0.067 (0.232)	0.144 (0.643)
	trust	0.006		-0.139 (0.125)	-0.028 (0.232)	0.023 (0.643)
BHPS	self-reported health	0.002		-0.271 (0.032)	-0.178 (0.140)	0.040 (0.829)
	trust	-0.006		-0.187 (0.032)	-0.107 (0.140)	0.002 (0.829)
GSOEP	self-reported health	0.003		-0.326 (0.162)	-0.067 (0.425)	0.163 (0.423)
	trust	0.040		-0.088 (0.162)	-0.032 (0.425)	0.009 (0.423)

*Notes:* Values in the brackets are weights for each group. Baseline specification is the same as in table 3. Interaction with marriage quality specification is the same as in table 4. The dependent variable is on a scale from 1 to 3. All regressions include the same controls as the baseline regressions as in table 3.

Table 13: **Robustness checks: Other measures of marriage quality**

Dependent Variable: Self-reported Happiness	
US GSS	family satisfaction (1-7)
unhappily married	-0.379 (2.2)
a little happily married	-0.305 (5.0)
some happily married	-0.348 (8.9)
fair happily married	-0.143 (6.2)
quite a bit happily married	-0.028 (1.7)
great happily married	0.175 (9.2)
very great happily married	0.398 (45.9)

*Notes:* For US GSS, family satisfaction is a categorical variable on a scale from 1 to 7 where 1 is not happy and 7 is very happy. We present coefficients in all regressions together with the *t*-statistics in parenthesis. Specification is estimated in the whole GSS sample from 1974 to 2004. All regressions include the same controls as the baseline regressions as in table 3.