

NBER WORKING PAPER SERIES

HOW'S LIFE AT HOME? NEW EVIDENCE ON MARRIAGE AND THE SET POINT
FOR HAPPINESS

Shawn Grover
John F. Helliwell

Working Paper 20794
<http://www.nber.org/papers/w20794>

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
December 2014

The authors are grateful for the research support of the Canadian Institute for Advanced Research (CIFAR), and for data access and assistance from the Gallup Corporation and the UK Office for National Statistics (ONS). We have benefitted especially from collaboration with Ewen McKinnon of the ONS in our use of the UK Annual Population Survey. Grover was in the Vancouver School of Economics when this research was undertaken, and is now at the Department of Finance, Ottawa. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

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NBER Working Paper No. 20794
December 2014
JEL No. I31,J12,J16

ABSTRACT

Subjective well-being research has often found that marriage is positively correlated with well-being. Some have argued that this correlation may be result of happier people being more likely to marry. Others have presented evidence suggesting that the well-being benefits of marriage are short-lasting. Using data from the British Household Panel Survey, we control individual pre-marital well-being levels and find that the married are still more satisfied, suggesting a causal effect, even after full allowance is made for selection effects. Using new data from the United Kingdom's Annual Population Survey, we find that the married have a less deep U-shape in life satisfaction across age groups than do the unmarried, indicating that marriage may help ease the causes of the mid-life dip in life satisfaction and that the benefits of marriage are unlikely to be short-lived. We explore friendship as a mechanism which could help explain a causal relationship between marriage and life satisfaction, and find that well-being effects of marriage are about twice as large for those whose spouse is also their best friend. Finally, we use the Gallup World Poll to show that although the overall well-being effects of marriage appear to vary across cultural contexts, marriage eases the middle-age dip in life evaluations for all regions except Sub-Saharan Africa.

Shawn Grover
Department of Finance Canada
90 Elgin St, Ottawa
Ontario, K1A 0G5
Canada
shawngrover@gmail.com

John F. Helliwell
Vancouver School of Economics
University of British Columbia
997-1873 East Mall
Vancouver BC V6T 1Z1
CANADA
and NBER
john.helliwell@ubc.ca

Introduction

The decision of whether and who to marry is one of the most important that people make. People typically enter into marriage with the expectation that their marriage and their relationship with their spouse will make their lives richer and more satisfying. To test whether the decision to marry actually makes people's lives more satisfying, we rely on individuals' assessments of the quality of their own lives. We follow most other research in using life evaluations, rather than measures of current emotions, because these evaluations have been found to be more reliably based on life circumstances. There are three main types of life evaluation collected: satisfaction with life as a whole (SWL), happiness with life as a whole, and the Cantril ladder, which asks respondents to think of their lives as a ladder, with the best possible life as a 10, and the worst as a 0, and then to evaluate their current lives on this scale. The Cantril ladder, by design, tends to produce lower average scores, at the population level, than either of the other measures, with the means of the other two measures being quite close together, when asked on the same scale of the same respondents. Despite these differences in mean values, all three measures deliver structurally equivalent information about the relative importance of the various factors that have been found to be linked to subjective well-being¹.

Most studies have found that marriage is positively associated with life satisfaction², although most of these studies have been conducted in western, educated, industrialized, and rich democracies³, and as discussed later in this paper, there are indications that these results may not be generalizable to the rest of the world. A positive correlation between marriage and life satisfaction is not in itself sufficient to show that someone who marries is more satisfied with their life than they would have been had they remained single. To draw a causal connection, we must remove or otherwise account for influences in the reverse direction or coming from some third factor. Those who marry tend to be more

1 See *World Happiness Report* (2012), pp. 13-14.

2 See Gove, Hughes and Briggs Style (1983), Di Tella, McCulloch & Oswald (2003), Peiró (2006) and Frijters and Beaton (2012)

3 Based on the implied acronym, such countries have been labeled WEIRD, See Henrich et al (2010), who argue that experiments in WEIRD contexts may be misleading guides to the lives lived by most of the world's population.

social, healthier, better educated and have more engaging jobs, all features of life likely to increase happiness with or without marriage. And there is lots of evidence that happier people tend to attract more friends and potential partners. While we can control for observable traits that we know are associated with well-being and marital status, it would also be useful to allow for personality differences and other unobserved factors that might increase the chances of marriage and of happiness through different channels. A primary contribution of this paper is to use panel data to directly control for pre-marital well-being levels to try to provide a secure estimate of the impact of marriage, excluding the impact of other factors that help to explain why (in some populations) married people are on average happier than those are not married.

This paper also looks again at whether marriage provides evidence for or against the set point theory of happiness. Some previous papers have argued that marriage boosts well-being only in the few years immediately before and immediately after the wedding. This paper tests these claims by looking at how the difference between the married and unmarried changes with age and the duration of marriage. We also discuss why the use of individual fixed effects in panel data could suggest full adaptation where in fact there are continuing happiness effects.

There are many possible mechanisms that could explain why marriage might have a causal effect on well-being. For instance, Becker (1974) showed the possibility of marriage increasing utility of both partners through complementarity of inputs in household production. As marriage has evolved over time and women's share of the labour market has increased, the model of marriage where one spouse works and the other attends to children seems to be less relevant to many modern households. An important role that a spouse continues to play in a successful marriage is that of a close friend and confidant; however, only one previous paper has, to our knowledge, estimated the extent to which friendship can condition the well-being benefits of marriage. This paper explicitly tests whether those who have a closer friendship with their spouse get more well-being gains from marriage than those who do not.

Literature Review

Although the cross-sectional correlation between marriage and well-being is well-established, at least in certain cultural contexts, some researchers have contested the causal effect. Stutzer and Frey (2006) found that “if singles at the age of 20 are asked about their satisfaction with life, the well-being of those who will get married later is higher than of those who will stay single throughout their life”⁴, although the authors also acknowledge that “it is unlikely that these selection effects can explain the entire difference in well-being between singles and married people”⁵.

A further question is whether the benefits of marriage are short-lived or long-lasting. Brickman and Campbell (1971) introduced the idea of a hedonic treadmill – the notion that people adapt to their sensory experiences and revert to a set-point level of well-being. Proponents of adaptation point to the relative stability of subjective well-being over time, the partial heritability of well-being and the ability of personality variables such as extroversion and neuroticism to predict well-being⁶.

Lucas et al (2003) analyzed the German Socio-Economic Panel Study (GSOEP) and concluded that the set point theory applies to marriage because they found that married individuals have a higher pre-marital happiness baseline than those who will remain unmarried and have further increased well-being around the time of their marriage but that their subsequent well-being reverts to their pre-marital baseline after a few years.

Soons, Liefbroer and Kalmijn (2009) offered four theoretical reasons why people in fact may not adapt to the well-being effects of marriage as readily as they adapt to most events: partner-related resources can manifest themselves in diverse ways, the importance of a partner varies as new situations and challenges arise in one's life, repeated downward comparisons when meeting single people in accordance with downward comparison theory and a partner is a “unique resource provider, who

4 Stutzer and Frey (2006, 334)

5 Stutzer and Frey (2006, 342)

6 Lucas (2007, 76)

cannot be replaced easily by other people.”⁷

The notion of adaptation requires identifying a baseline to which individuals will revert. Many studies that find adaptation use the pre-marital (or pre-relationship) level of well-being as the baseline. This approach implicitly assumes that had the marital event not occurred, the well-being would have remained at “baseline” for the entire duration. However, Blanchflower and Oswald (2008) found that well-being follows a U-shape in age. The authors found that well-being falls through early adulthood until it reaches a minimum (typically in the late 40s but varying across countries) and then rises after that minimum. Thus, as well-being is changing *ceteris paribus* with age, pre-marital well-being levels do not provide an appropriate counterfactual baseline to represent what the individuals’ well-being would have been had they not married.

Zimmermann and Easterlin (2006) analyzed the GSOEP and found that when allowing age to vary “individuals who remain married two or more years do not revert to their baseline value before marriage”⁸. The authors’ reason as to why their results differ from Lucas et al (2003) was due to “their [Lucas et al] failure to treat age as varying with time, and thus to control for life circumstances that affect life satisfaction negatively”⁹.

Yap, Anusic & Lucas (2012) used a propensity score matching method to match unmarried individuals who would go on to be married to similar individuals who would remain unmarried for the duration of the sample and found that while the well-being of the married sample rose around the time of their marriage and then fell, the well-being of the unmarried sample fell during the entire period. This finding is consistent with the U-shape in age as most people marry in their 20s and 30s when well-being is generally in decline. Thus, this finding can reconcile why married individuals simultaneously revert to their premarital baseline and maintain a well-being advantage over their peers who remain

7 Soons, Liefbroer and Kalmijn (2009, 1257)

8 Zimmermann and Easterlin (2006, 519)

9 Zimmermann and Easterlin (2006, 519)

unmarried. The authors found similar results to hold in Switzerland¹⁰ and Australia¹¹.

Clark and Georgellis (2013) used the British Household Panel Survey (BHPS) to show that married people are more satisfied in the years immediately before and immediately after their marriage, but that marriage had a negligible effect for individuals who had been married for at least five years. The authors used individual fixed effects in the panel in an attempt to control for unobserved selection differences between the married and unmarried which are not caused by their marital status. However, given that only twelve waves of the BHPS have life satisfaction data, there is limited variation of marital status across survey waves. Thus, as will be discussed later in this paper, the use of individual fixed effects is likely to have excessively depressed the estimated long-term well-being effects of marriage.

Qari (2014) used the GSOEP to show that the adaptation result is sensitive to the baseline period used. Qari found that “using five years prior to marriage as the relevant baseline year allows us to calculate utility while single more accurately. If we – instead of this – use 1–2 years prior to marriage as the reference category, the same sample generates evidence of complete “adaptation” as in previous longitudinal studies”¹². Thus, when analyzing the panel data results in the BHPS, we must be careful as to what baseline we choose, noting that using individual fixed effects will be implicitly choosing a baseline equivalent to the within-sample pre-marital years for those who eventually became married. If this time period is too short, as we find to be the case with the BHPS life satisfaction data, then the baseline could be contaminated by the happy period during which friendship with the eventual marriage partner is being developed and enjoyed.

To implement our exploration of friendship as a possible mediating factor to help explain why the married would be more satisfied than the unmarried, it must first be established that friendship matters for well-being. Similar to marriage, there is a risk of reverse causation – that more satisfied

10 Anusic, Yap and Lucas (2014a)

11 Anusic, Yap and Lucas (2014b)

12 Qari (2014, 36)

people are more likely to develop and sustain friendships. Using the BHPS and individual fixed effects, Powdthavee (2008) found that “a move from “seeing friends or relatives less than once a month” to “seeing friends or relatives on most days” is now estimated to be worth an extra £85,000 a year for a representative individual”¹³.

If marriage affects well-being through friendship, then we would expect that friendship and marriage could be substitutes and that friendship would be more important for the unmarried than the married, as the married would have much of their friendship needs met through their spouse. Helliwell and Huang (2013) found that “the estimated contribution of having more than more than 30 friends is 0.72 in the un-married/partnered sample; the standard error is 0.18. In contrast, the estimated contribution is only 0.14 for people who are married or in a common-law partnership; the standard error is 0.14. There is thus no overlap in the 95% confidence intervals of the two estimates”¹⁴. This paper explores whether the closeness of friendship with one's partner affects the well-being benefit of the marriage.

Data and Summary Statistics

This paper uses three data sets: the United Kingdom's Annual Population Survey (APS), the British Household Panel Survey (BHPS) and the Gallup World Poll (GWP).

The APS is a cross-sectional dataset with 328,665 observations collected between May 2011 and April 2013 in the United Kingdom. The APS data set has four relevant well-being measures: life satisfaction, worthwhileness, anxiety and happiness. This paper focuses on the life satisfaction measure, where respondents are asked “Overall, how satisfied are you with your life nowadays?” Each well-being measure is measured on a 0-10 scale. Table 1 summarizes the key demographics¹⁵, well-being measures and marital statuses in the APS dataset.

The BHPS is a panel data set with 18 waves, collected from 1991 to 2009 in the United

¹³ Powdthavee (2008, 1470)

¹⁴ Helliwell and Huang (2013, 11)

¹⁵ The gross pay measure is artificially capped at 788 pounds per week in order to make it difficult to personally identify high-earning outliers

Kingdom. The BHPS' principal well-being measure is overall life satisfaction, where respondents are asked "How dissatisfied or satisfied are you with your life overall" and scores are measured on a 1-7 scale. The BHPS has overall life satisfaction only for Waves 6-10 and 12-18, thus these waves will be the principal focus of this paper's analysis. Overall, the BHPS surveyed approximately 30,000 individuals; however, not all respondents completed all waves. There are only 5,337 respondents for whom we have life satisfaction scores for both Wave 6 and Wave 18. Table 2 reports the summary statistics for each of Wave 6 and Wave 18.

The GWP is a cross-country and cross-sectional dataset where observations were taken from 2005 to 2013. The life evaluation measure in the GWP is the Cantril ladder, which is slightly different than life satisfaction. Respondents are asked "to evaluate the quality of their lives on an 11-point ladder scale running from 0 to 10, with the bottom rung of the ladder (0) being the worst possible life for them and 10 being the best possible"¹⁶. Table 3 reports the summary statistics for the GWP by region of the world.

Causal Effect of Marriage

Those who are more satisfied with their life are more likely to get and stay married as happier people may be more likely to enter into and maintain romantic relationships and previous research has provided evidence for some reverse causation. Additionally, factors such as sociability, income, education and health status are correlated and possibly even causally related to both well-being and propensity to marry.

To provide a likely upper-bound estimate of the possible causal effects running from happiness to marriage, we estimate the impact of life satisfaction ten periods ago on probability of marriage considering only the population that was unmarried ten, nine and eight periods ago. We find that an increase of one point on the life satisfaction scale is associated with an increase in probability of marriage of 1.37%. This effect is significant at the 1% level. For perspective, the mean probability of

¹⁶ World Happiness Report (2012, 11)

someone unmarried in each of ten, nine and eight periods ago being married in the current period is 22.74%. This indicates that the selection effects found in papers such as Stutzer and Frey (2006) are present in the BHPS data as well.

The existence of a selection effect does not preclude a true causal effect from marriage to life satisfaction. To test whether the reverse causation can fully explain the life satisfaction difference between the married and unmarried, we use the BHPS to regress life satisfaction on relationship status, lagged life satisfaction from ten periods ago and other individual characteristics. Standard errors are clustered at the level of the individual respondent. Model 1 in Table 4 below provides the coefficients when no lagged life satisfaction is included. This is the relationship between marriage and life satisfaction including any selection bias into marriage that is not captured by controlling for age, health limitations and log income. Model 2 includes life satisfaction from ten waves ago as an independent variable. If there are stable but unobserved pre-marital differences in circumstances and personality that increase both happiness and marriage prospects, any resulting danger to the estimate of the effects of marriage on happiness can be allowed for by including a baseline measure of each individual's life satisfaction at the beginning of the sample period. Any remaining effect should be attributable to the effect of marriage.

Model 3 includes lagged life satisfaction and also includes the life satisfaction changes that occurred between ten periods ago and nine periods ago and between nine periods and eight periods ago, to capture any trends in life satisfaction that may have occurred prior to any potential marriage. Since this sample restricts itself to only those who were unmarried eight periods ago, the life satisfaction trend from ten periods ago to eight periods ago will likely capture some of the anticipatory benefits of marriage for some people in the sample who will be married shortly after the trend ends eight periods ago. This could explain why the marriage effect is slightly reduced in this specification, as any anticipation effects captured in the trend would lower the estimated effect of marriage.

The inclusion of lagged life satisfaction as an independent variable lowers the coefficient on

being married slightly from 0.480 to 0.427 and the inclusion of the previous life satisfaction lowers the coefficient to 0.347. In both cases, the effect still remains significant at the 0.1% level and the difference between singles and those who are living as couple but unmarried is approximately three-quarters of the difference between singles and married individuals. The inclusion of within-sample changes in life satisfaction lowers the estimated effects of marriage, and perhaps excessively so, as noted above. Hence the estimates including only the initial life satisfaction as a personality control are probably more appropriate.

Model 4 is equivalent to Model 2 with the inclusion of the interaction term to cover the difference between men and women in the well-being effect of marriage. This model shows that the life satisfaction impact of marriage is 0.161 higher for females than males. This effect is significant at the 5% level.

The estimates of the average well-being effects of marriage may include some unhappy years that precede separation and divorce. Thus, the long-term well-being difference between the never-married and those who stay married may be greater than the above would suggest.

Marriage and the U-shape in Age

If the benefits of marriage are fleeting and individuals return to their set-point level of well-being, we would expect that the difference between the married and unmarried would be greatest at ages when many people of that age are recently married and much smaller at ages when fewer people are getting married. Given that the median of age of marriage in the United Kingdom is approximately 30.8 for men and 28.9 for women¹⁷, adaptation theory would suggest that the difference between married and unmarried should be the greatest in one's late 20's and 30's. But the cross-sectional evidence from the UK Annual Population Survey rules out this possibility.

Figure 1 shows that the U-shape in marriage exists for both the married and unmarried but is deeper for the unmarried. Figure 2 shows the difference between the married and unmarried by age

¹⁷ Haurant (2013)

group, and we can see the difference between married and unmarried is greatest when people are in their late 40s and 50s¹⁸.

We can also test whether the above result is driven by disproportionate selection out of marriage, where people who are less satisfied with their lives will be more likely to divorce. This is done in Figures 3 and 4, where we see similar results persist when we compare people who have ever been married to people who have never been married, although, as would be expected, the difference between the ever-married and the never-married is smaller than the difference between the married and unmarried. Figure 5 shows the difference between married and unmarried over age by gender. Marriage seems to be more important for women than men in middle ages, with the largest gap for those ages 51 to 55 where there is no overlap between the 95% confidence intervals.

One hypothesis that could explain why the U-shape in life satisfaction over age is deeper for the unmarried than the married is that the social support provided by a spouse helps ease the stresses of middle age. It has already been shown, although with US data, that the U-shape in age, for daily measures of positive and negative affect, is smaller on weekends than of weekdays, and the determinants of the additional weekend happiness are shown to relate to the social contexts both at home and at work¹⁹. The U-shape difference for the married is likely to have a similar explanation, although the BHPS does not have sufficient variables describing the social context to permit more direct testing.

Why not Fixed Effects?

As noted in the literature review, Clark and Georgellis (2013) analyzed the relationship between marriage and well-being in the BHPS using individual fixed effects. This approach makes intuitive sense because we would expect that the fixed effect would eliminate any time-invariant unobservable

18 This is not a definitive rejection of full adaptation, as there could be a small group of people becoming married in middle age who have a dramatic but temporary increase in life satisfaction or the selection effects between the married and unmarried could be largest in middle age; however, we believe that is unlikely that these could explain the difference between Figure 1 and what the adaptation theory would predict.

19 See Helliwell and Wang (2014, Table 6).

selection bias; and thus only the remaining estimated effect of marriage could be interpreted as causal. However, this approach is problematic in the BHPS due to the relatively short duration of the dataset and the large number of lags and leads included by Clark and Georgellis (2013).

The use of fixed effects in panel data with rarely varying regressors is problematic. Beck (2001) noted this issue and said “although we can estimate [a model] with slowly changing independent variables, the fixed effect will soak up most of the explanatory power of these slowly changing variables. Thus, if a variable ... changes over time, but slowly, the fixed effects will make it hard for such variables to appear either substantively or statistically significant”²⁰.

Plumper and Troeger (2007) noted that variables can be time-invariant either by definition or because of the period or sample under analysis. The BHPS suffers from the latter problem as we only have twelve years of life satisfaction data. Marital statuses typically do not differ much over short periods of time. In the BHPS, 92.73% of people who were single in a period remained single in the next period, 82.45% of people who were living as couple remained living as a couple in the next period and 97.83% of people who were married remained married in the next period. Plumper and Troeger (2007) proposed a method entitled fixed effects vector decomposition (FEVD) to deal with time-invariant or rarely variant regressors and Boyce (2010) applied the method to life satisfaction and marital status and found that the marriage benefit was nearly three times larger in a model using FEVD rather than a model just using fixed effects. This suggests that the limited variance of marital status in the panel data is a real problem with significantly large effects.

The anticipatory effects of marriage and the use of lags and leads make the relatively invariant nature of the BHPS even more questionable. Clark and Georgellis (2013) used dummies for four periods prior to marriage and five periods after marriage. Thus, the long-term effect of marriage, which is the effect after five periods can be compared to the pre-marital baseline only if someone has been in the sample for that entire period. This would require someone to have at least five unmarried periods

²⁰ Beck (2001, 285)

and at least six married periods.

By running the panel regression with fixed effects, the estimated marriage effect is identified by comparing to a baseline level of well-being, which includes whatever unmarried years the individual has in the panel. The “all people” regression in Table 5 shows that using this specification and similar lags and leads as employed by Clark and Georgellis (2013), that the long-term marriage effect for people who have been married at least six years is approximately zero. However, if we shift the baseline by only including individuals in the regression if they have at least five periods of a “never married” status, then the long-term effect returns to being large and significant at the 5% level. We believe that this is a more appropriate specification as failing to ensure that people have at least five years to use a pre-marital baseline causes the anticipatory well-being effects of marriage and the limitations of the BHPS to falsely drive down the estimated impact of marriage.

Friendship as a Mechanism

The potential mechanisms through which marriage could have a causal effect on well-being are numerous. Ribar (2004) found that there is a wage differential between the married and unmarried²¹; however, given that the estimations in the previous sections of this paper control for income, it is unlikely that economic factors are a key part of the explanation for the well-being difference between the married and unmarried.

The difference between how people perceive changeable versus unchangeable decisions may be a mechanism to explain the higher well-being of the married. Gilbert and Ebert (2002) experimentally gave some participants photographs with the opportunity to change photographs at a later time and some participants no opportunity to change their mind. They found that contrary to orthodox economic theory, those “who had been given the opportunity to change their outcome were less likely to grow

21 Ribar (2004) provides five hypotheses as to why this wage differential exists: specialization of activities allowing one partner to focus on market activities and one to focus on non-market activities, instrumental support of a partner's career such as reviewing resumes and entertaining co-workers, marriage as a stabilizing or maturing influence, married individuals may sacrifice amenities in a job for higher pay to support their family and market discrimination in favour of married men compared to unmarried men.

relatively fond of it over the course of several days than were experiencers who had not been given that opportunity, even though only one of the experiencers who had been given the opportunity chose to exercise it”²². Gilbert proposed to his long-term girlfriend shortly after making this finding and he is reported as having said “I love my wife more than I loved my girlfriend” due to the irrevocability of the decision²³. Gilbert and Ebert (2002) noted that the increased societal acceptability of divorce over the 20th century may alter this perception of irrevocability²⁴.

However, for the purpose of this paper we focus on the mechanism of friendship and the social relationship between spouses. Friendship could help explain why the benefits of marriage are not subject to adaptation, as one's partner provides unique social support for each challenge one faces in life. Additionally, friendship can help explain why people who are unmarried but living as a couple enjoy most of the well-being benefits of marriage, especially if, as we find, their partner is also their best friend.

If friendship explains much of the well-being benefits of marriage, then life satisfaction should be higher for those whose spouses are also close friends. This is easily tested using the BHPS data, since respondents are asked about their closest friendship, with spouse or partner being one of the choices. Table 6 shows the distribution by relationship status in Wave 17 of the BHPS of whether an individual lists their best friend as their partner or lists someone else as their best friend. Approximately half of married people and of those who are cohabiting list their partner as their best friend and less than five percent of people in any other marital status consider their partner to be their best friend²⁵.

To test the impact of having a best friend as a partner, we regressed life satisfaction on relationship status interacted with whether their partner is their best friend and standard controls and the results are presented in Table 7. Given their small number and unusual status, those who are neither

22 Gilbert and Ebert (2002, 508)

23 Ury (2008)

24 Gilbert and Ebert (2002, 504)

25 There are differences by gender. Among the married, 53% of men and 43% of women respondents list their spouse as their best friend. For the cohabiting unmarried, the percentages are 48% for men and 44% for women.

married nor cohabitating but whose partner is still their best friend are omitted from the analysis. Those whose spouse or partner is also considered their best friend get almost twice as much additional life satisfaction from marriage or cohabitation as do others²⁶.

Figure 6 shows that married individuals whose spouse is their best friend have higher life satisfaction than those who do not, even when controlling for age, gender, income and health limitations, and the same results hold for those who are cohabiting. Figure 7 shows that the effect of being best friends with one's spouse persists even when previous life satisfaction is controlled for.

Figure 8 shows the same specification as Figure 6, except with the sample divided by gender. The well-being benefit of being married to one's best friend appears much higher for women than for men, although on average fewer women than men regard their spouse as their best friend. Further research is required to indicate how the friendship mechanism may differ for men and women or if there are other factors driving this result.

Our finding that the happiness benefits of marriage flow largely through social channels, in particular through friendship, has strong parallels to the results of by Lim and Putnam (2010) for the life satisfaction effects of religion. They find that most or all of the SWB benefits of religious involvement flow through the number of church friends, in particular those who share common values. The two pieces of research taken together suggest that friendship is a strong mediating factor for the life satisfaction consequences of two key life circumstances: marriage and religion. While all friends are important for happiness, those who share who share beliefs (in the Lim and Putnam example) or are married to each other (as in our results) are super-friends, with well-being effects apparently much larger than for friends on average. Our results for the U-shape in age are also consistent with our emphasis on the social context.

²⁶ The impact of being best friends with one's spouse was not significantly different for married individuals with and without children.

International Results

Marriage is a social, cultural, religious and legal institution, with different meaning for different individuals and different cultures. Therefore, the well-being effects of marriage found in this paper may be specific to the cultural context of the participants of the dataset. Using the cross-sectional Gallup World Poll, we use OLS by world region to determine the marriage effect on life evaluations by region and Table 8 summarizes the results of this analysis.

We find that marriage is significantly positively related with life evaluations in Western Europe (excluding the United Kingdom), United Kingdom, Central and Eastern Europe, the Commonwealth of Independent States (including Russia), Australia-New Zealand, East Asia, North America and the Middle East & North Africa. Marriage is significantly negatively associated with life evaluations in Latin America and the Caribbean and Sub-Saharan Africa. Marriage is not significantly associated with life evaluations in the Southeast Asia and South Asia.

In Table 9, we add interaction effects between marriage and age to test whether the U-shape in age persists across countries and whether marriage affects the middle-age dip globally in the same way it does in the United Kingdom. Somewhat surprisingly, the results are remarkably consistent across regions. With the exception of Sub-Saharan Africa, in each region, the U-shape over age exists for both married and unmarried and is deeper for the unmarried. Appendix A shows the U-shape for each region across age, by five-year age brackets²⁷. We believe the most natural hypothesis is that the social support provided by marriage is most important in middle-age and this social support is applicable, to varying degrees, in all cultures.

Summary and Conclusions

This paper makes four key contributions. First, even when controlling for pre-marital life satisfaction levels, those who marry are more satisfied than those who remain single. Second, contrary

²⁷ The on-line Appendix B shows the difference between married and unmarried ladder scores in each global region, separately for males and females.

to past papers claiming full adaptation, the benefits of marriage persist in the long-term, even if the well-being benefits are greatest immediately after marriage. Third, marriage seems to be most important in middle age when people of every marital status experience a dip in well-being. This result seems to be applicable globally, even in regions of the world where the average effects of marriage are not positive. Fourth, those who are best friends with their partners have the largest well-being benefits from marriage and cohabitation, even when controlling for pre-marital well-being levels. The well-being benefits of marriage are on average about twice as large for those (about half of the sample) whose spouse is also their best friend.

This paper provides evidence that the long-term benefits of marriage are substantial and worth further exploration. The evidence in this paper helps to solidify the important case that changes in key life circumstances have large and enduring consequences for life evaluations. These results combine with the large international differences in average life evaluations (as shown in Table 3) to demonstrate that life evaluations are not fully determined by genetic and other factors to define immutable long-term individual happiness set points²⁸.

²⁸ Although Cummins et al (2014) argue that set point theory can be reconciled with the idea that life circumstances have long-term impacts on life satisfaction.

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variable	N	mean	sd	min	max
female	328,665	56.19%	49.62%	0	1
age	328,665	51.73	17.36	16	99
satis	328,665	7.44	1.90	0	10
happy	328,665	7.32	2.23	0	10
anxious	328,665	3.09	2.90	0	10
worth	328,665	7.72	1.79	0	10
grosspay	91,824	497.94	198.77	1	788
single	328,665	25.18%	43.40%	0	1
married	328,665	50.70%	50.00%	0	1
separated	328,665	3.51%	18.39%	0	1
divorced	328,665	11.34%	31.70%	0	1
widowed	328,665	9.03%	28.66%	0	1
CivilPartner	328,665	0.25%	4.96%	0	1

Table 1: Summary Statistics of APS

variable	Wave 6					Wave 18				
	N	mean	sd	min	max	N	mean	sd	min	max
female	9438	53.01%	49.91%	0	1	13685	54.41%	49.81%	0	1
age	9438	43.71	18.46	15	97	14418	46.75	18.94	15	101
Life Satis.	9032	5.24	1.32	1	7	13417	5.24	1.23	1	7
married	9412	54.35%	49.81%	0	1	14385	51.89%	49.97%	0	1
livingascouple	9412	10.16%	30.21%	0	1	14385	12.09%	32.60%	0	1
separated	9412	1.56%	12.40%	0	1	14385	1.43%	11.88%	0	1
divorced	9412	4.89%	21.56%	0	1	14385	5.60%	22.99%	0	1
widowed	9412	7.34%	26.08%	0	1	14385	7.15%	25.76%	0	1

Table 2: Summary Statistics of BHPS for Waves 6 and 18

	ladder (life eval)	age	married	Log Income	female	N
Australia-New Zealand	7.37	47.41	57.77%	10.52	56.04%	9956
Central & Eastern Europe	5.30	45.70	57.64%	9.21	56.28%	90094
Commonwealth of Independent States	5.10	42.18	57.23%	8.76	58.86%	81392
East Asia	5.40	43.83	68.43%	9.37	53.78%	57184
Latin America & Carribean	6.05	40.15	52.84%	8.80	56.50%	120627
Middle East and North Africa	5.43	35.34	60.16%	9.20	48.86%	152892
North America	7.41	49.83	57.48%	10.62	53.80%	14216
South Asia	4.81	36.09	72.17%	8.16	49.61%	74463
Southeast Asia	5.40	39.75	67.62%	8.47	57.42%	56977
Sub-Saharan Africa	4.39	33.61	50.13%	7.87	48.74%	180433
United Kingdom	6.92	51.68	54.36%	10.29	53.70%	20851
Western Europe (excluding UK)	6.83	49.61	59.62%	10.30	57.48%	92628
Total	5.48	40.37	58.38%	8.91	53.45%	951713

Table 3: Summary Statistics of GWP

	Model 1	Model 2	Model 3	Model 4
married	0.482***	0.427***	0.346***	0.343***
	(0.054)	(0.047)	(0.047)	(0.061)
livingascouple	0.361***	0.307***	0.259***	0.307***
	(0.055)	(0.049)	(0.049)	(0.049)
divorced	-0.108	-0.011	0.002	-0.001
	(0.086)	(0.076)	(0.077)	(0.076)
widowed	0.095	0.083	0.036	0.097
	(0.108)	(0.096)	(0.095)	(0.096)
separated	-0.179	-0.131	-0.153	-0.125
	(0.214)	(0.187)	(0.180)	(0.187)
female	-0.055	-0.010	0.011	-0.049
	(0.043)	(0.038)	(0.038)	(0.046)
married and female				0.161*
				(0.076)
age at date of interview	-0.031***	-0.007	-0.002	-0.007
	(0.009)	(0.008)	(0.007)	(0.008)
agesq	0.038***	0.013	0.007	0.013
	(0.008)	(0.008)	(0.007)	(0.008)
HealthLimits	-0.917***	-0.774***	-0.683***	-0.775***
	(0.063)	(0.057)	(0.059)	(0.057)
LogIncome	0.034	0.027	0.025	0.031
	(0.021)	(0.019)	(0.019)	(0.019)
LfSat10PeriodsAgo		0.322***	0.505***	0.322***
		(0.015)	(0.020)	(0.015)
LfSatChange10PeriodsAgo			0.341***	
			(0.020)	
LfSatChange9PeriodsAgo			0.201***	
			(0.017)	
Constant	5.260***	3.111***	2.129***	3.094***
	(0.285)	(0.273)	(0.279)	(0.274)
Observations	5923	5806	5415	5805
Adjusted R-squared	0.115	0.228	0.290	0.229

Standard errors in
parentheses

* p<0.05

** p<0.01

*** p<0.001

Table 4: Life Satisfaction Controlling for Lagged Life Satisfaction

	All People	Only 5 Single Periods
3 periods before marriage	-0.006 (0.034)	-0.052 (0.080)
2 periods before marriage	0.072* (0.031)	0.059 (0.073)
1 period before marriage	0.123*** (0.028)	0.264*** (0.069)
Period after marriage	0.262*** (0.031)	0.453*** (0.068)
2 periods after marriage	0.231*** (0.034)	0.373*** (0.081)
3 periods after marriage	0.192*** (0.036)	0.339*** (0.093)
4 periods after marriage	0.135*** (0.037)	0.329** (0.112)
5 periods after marriage	0.104* (0.041)	0.374** (0.136)
At least 6 periods after marriage (or married since entry into panel)	-0.010 (0.028)	0.349* (0.140)
3 periods before living as couple	-0.054 (0.033)	-0.030 (0.049)
2 periods before living as couple	-0.034 (0.030)	0.047 (0.046)
1 period before living as couple	0.084** (0.026)	0.114** (0.043)
Period after starting to live as couple	0.225*** (0.028)	0.208*** (0.043)
2 Periods after starting to live as couple	0.145*** (0.033)	0.187*** (0.051)
3 Periods after starting to live as couple	0.040 (0.037)	0.118 (0.064)
4 Periods after starting to live as couple	0.077 (0.042)	0.098 (0.076)
5 Periods after starting to live as couple	0.026 (0.049)	0.060 (0.090)
6+ periods after starting to live as couple (or since entry into panel)	0.119*** (0.026)	0.061 (0.070)
divorced	-0.147*** (0.031)	0.149 (0.191)
widowed	-0.333*** (0.037)	-0.216 (0.273)
separated	-0.362*** (0.035)	0.009 (0.147)
Age, Child, Health and Income Controls?	Yes	Yes
Observations	123860	20127
Groups	24839	3525

Standard errors in parentheses

* p<0.05

** p<0.01

*** p<0.001"

Table 5: Regression results with lags and leads with changing baseline

	Married		Living As Couple		Other	
	Freq.	%	Freq.	%	Freq.	%
Partner is Closest Friend	3662	47.4	817	45.64	260	4.89
Other Closest Friend	4064	52.6	973	54.36	5057	95.11
Total	7726	100	1790	100	5317	100

Table 6: Distribution of Closest Friend by Relationship Status

	W/o Lagged Life Sat	W/ Lagged Life Sat
married	0.304*** (0.021)	0.225*** (0.043)
livingascouple	0.187*** (0.028)	0.308*** (0.073)
MarriedXClosestFriendPartner	0.222*** (0.017)	0.191*** (0.034)
LACXClosestFriendPartner	0.227*** (0.032)	0.147 (0.087)
age at date of interview	-0.047*** (0.003)	-0.002 (0.007)
agesq	0.057*** (0.003)	0.008 (0.006)
HealthLimits	-0.874*** (0.022)	-0.735*** (0.049)
LogIncome	-0.012* (0.006)	-0.005 (0.016)
female	0.053*** (0.015)	0.019 (0.031)
L10.satisfaction with: life overall		0.367*** (0.014)
Constant	5.961*** (0.061)	3.034*** (0.256)
Observations	50047	5243
Adjusted R-squared	0.103	0.259

Standard errors in parentheses

* p<0.05

** p<0.01

*** p<0.001

Table 7: Regression results by marital status and whether partner is best friend

	Australia-New Zealand	Central & Eastern Europe	Commonwealth of Ind. States (inc. Russia)	East Asia
Age	-0.060***	-0.072***	-0.029***	-0.057***
Age Sq	0.072***	0.055***	0.015***	0.059***
married	0.266***	0.049**	0.076***	0.208***
LogIncome	0.442***	0.838***	0.607***	0.683***
Constant	3.586***	-0.560***	0.586***	-0.053
Observations	9893	82986	78845	49304
Adjusted R-squared	0.058	0.160	0.114	0.175

	Latin America & Carribean	Middle East and North Africa	North America	South Asia
Age	-0.052***	-0.033***	-0.067***	-0.017***
Age Sq	0.045***	0.027***	0.072***	0.016***
married	-0.076***	0.159***	0.431***	-0.027
LogIncome	0.699***	0.794***	0.371***	0.743***
Constant	1.147***	-1.238***	4.514***	-0.882***
Observations	118191	150356	14088	73517
Adjusted R-squared	0.087	0.159	0.064	0.092

	Southeast Asia	Sub-Saharan Africa	United Kingdom	Western Europe (excl UK)
Age	-0.028***	0.002	-0.059***	-0.053***
Age Sq	0.031***	-0.008***	0.066***	0.049***
married	-0.025	-0.048***	0.437***	0.101***
LogIncome	0.567***	0.342***	0.339***	0.875***
Constant	1.091***	1.802***	4.268***	-1.005***
Observations	56270	172053	19867	91809
Adjusted R-squared	0.148	0.050	0.059	0.137

* p<0.05

** p<0.01

*** p<0.001

Table 8: Effect of marriage on life evaluation (0-10 scale) by region

	Australia-New Zealand	Central & Eastern Europe	Commonwealth of Ind. States (inc. Russia)	East Asia
Age	-0.074***	-0.080***	-0.035***	-0.080***
Age Sq	0.085***	0.064***	0.021***	0.083***
married	-0.692**	-0.466***	-0.295**	-0.844***
ageXmarried	0.041***	0.023***	0.017***	0.049***
agesqXmarried	-0.039***	-0.023***	-0.016***	-0.049***
LogIncome	0.429***	0.837***	0.606***	0.681***
Constant	4.010***	-0.379***	0.722***	0.399***
Observations	9893	82986	78845	49304
Adjusted R-squared	0.060	0.160	0.114	0.177

	Latin America & Caribbean	Middle East and North Africa	North America	South Asia
Age	-0.061***	-0.056***	-0.092***	-0.026***
Age Sq	0.054***	0.056***	0.096***	0.022***
married	-0.600***	-0.629***	-1.437***	-0.357***
ageXmarried	0.024***	0.044***	0.079***	0.015**
agesqXmarried	-0.024***	-0.052***	-0.075***	-0.013*
LogIncome	0.696***	0.793***	0.362***	0.740***
Constant	1.340***	-0.863***	5.141***	-0.691***
Observations	118191	150356	14088	73517
Adjusted R-squared	0.087	0.160	0.068	0.092

	Southeast Asia	Sub-Saharan Africa	United Kingdom	Western Europe (excl UK)
Age	-0.044***	0.000	-0.082***	-0.058***
Age Sq	0.048***	-0.009***	0.087***	0.054***
married	-0.807***	-0.338***	-1.486***	-0.277**
ageXmarried	0.037***	0.010**	0.078***	0.016***
agesqXmarried	-0.037***	-0.004	-0.072***	-0.015***
LogIncome	0.563***	0.339***	0.334***	0.873***
Constant	1.436***	1.894***	4.885***	-0.871***
Observations	56270	172053	19867	91809
Adjusted R-squared	0.149	0.050	0.062	0.138

* p<0.05 ** p<0.01 *** p<0.001

Table 9: Effect of marriage-age interactions on life evaluation (0-10 scale) by region

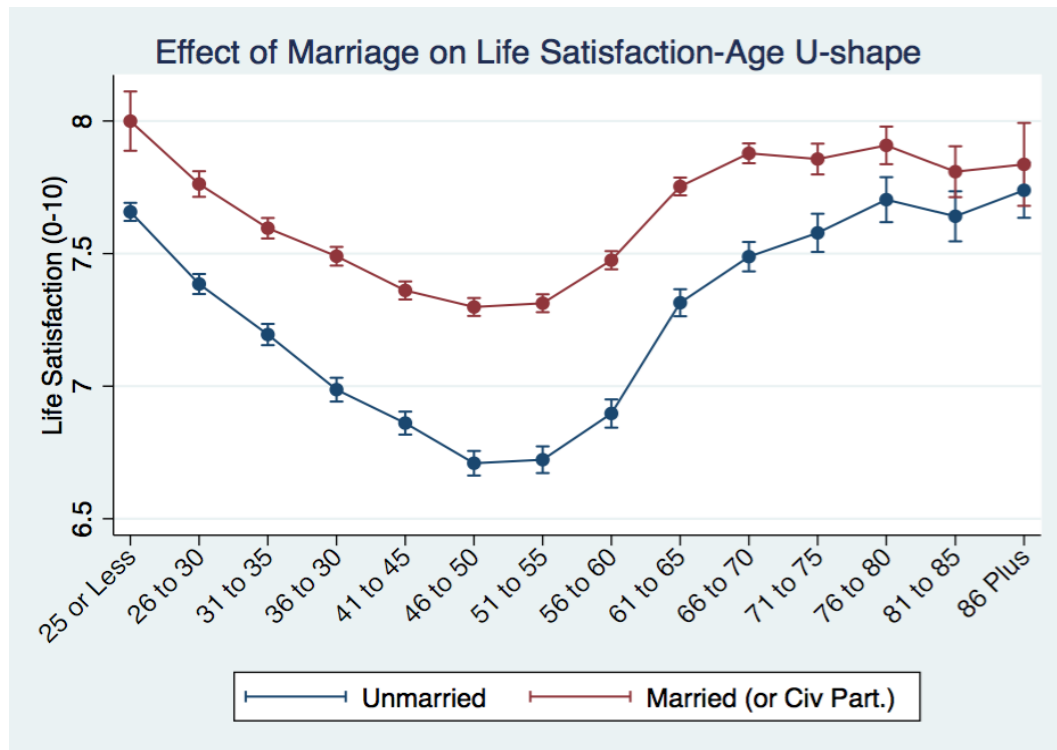


Figure 1: Difference in U-shape Between Married and Unmarried

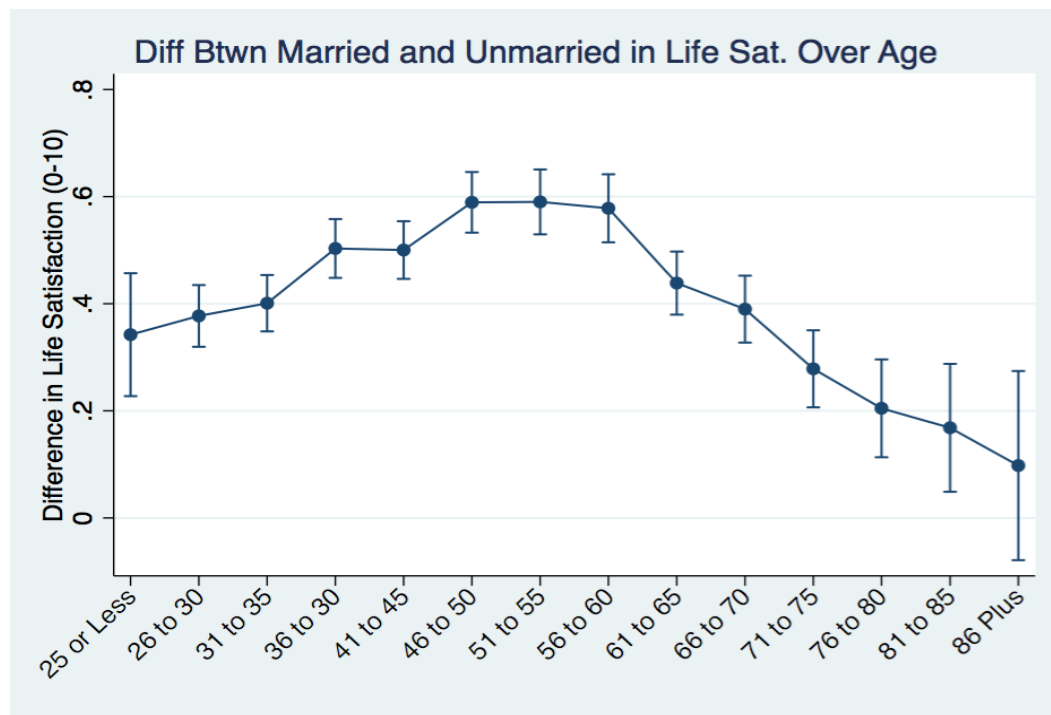


Figure 2: Life Satisfaction Difference Between Married and Unmarried over Age

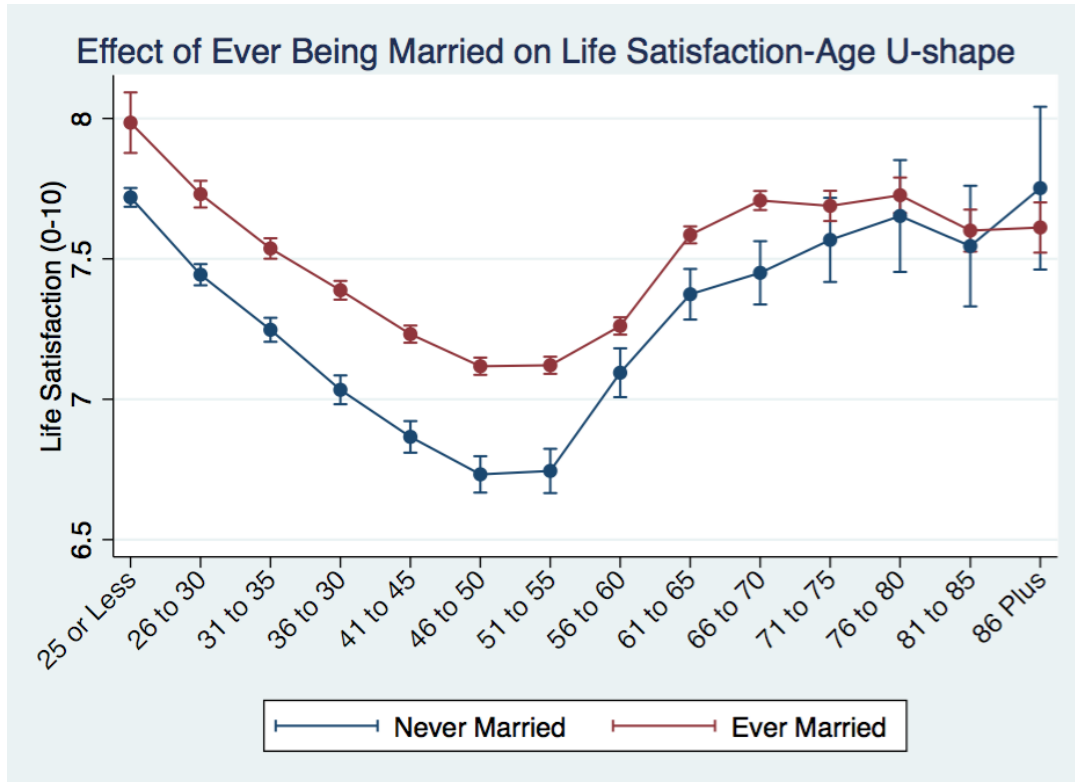


Figure 3: Difference in U-shape Between Ever Married and Never Married

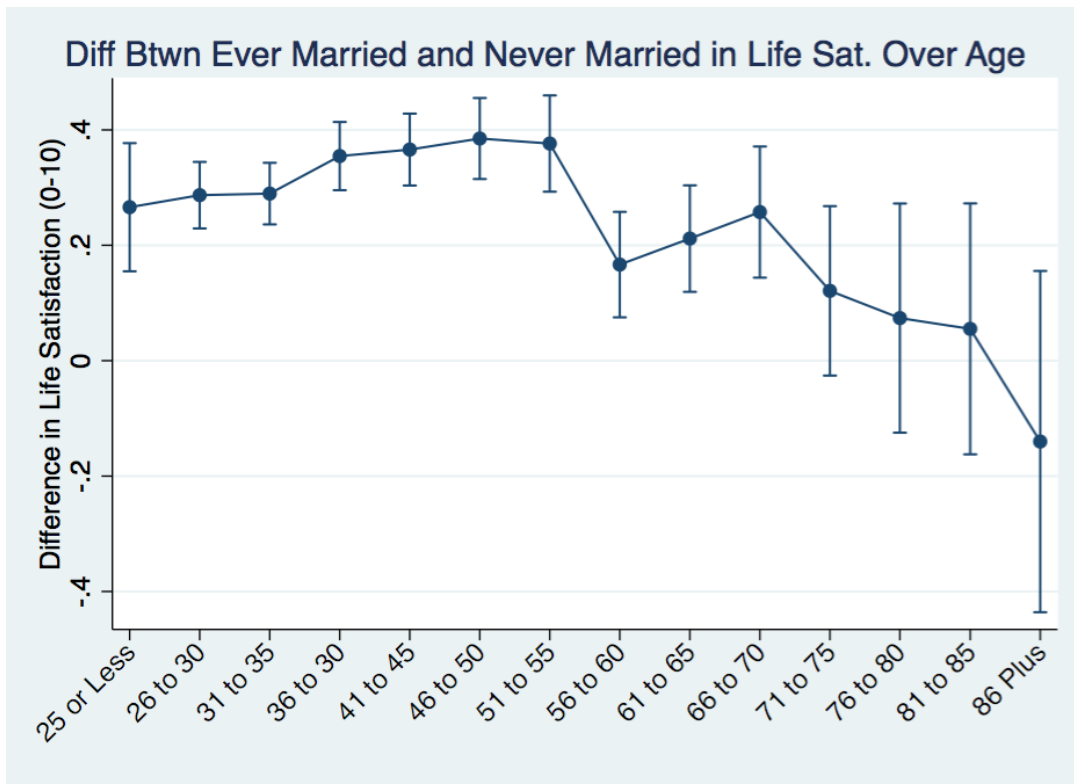


Figure 4: Life Satisfaction Difference Between Ever Married and Never Married over Age

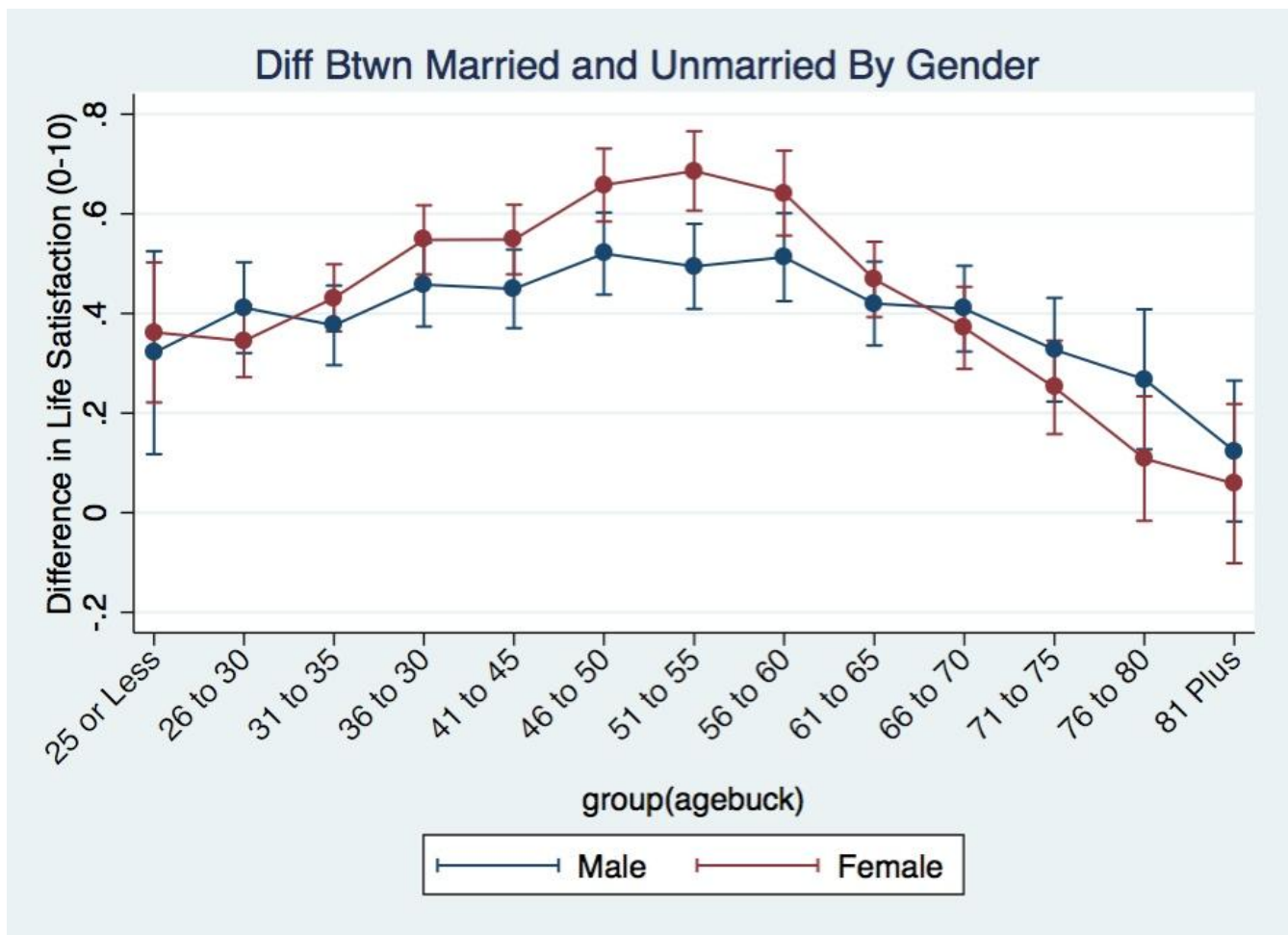


Figure 5: Life Satisfaction Difference Between Ever Married and Never Married by Gender

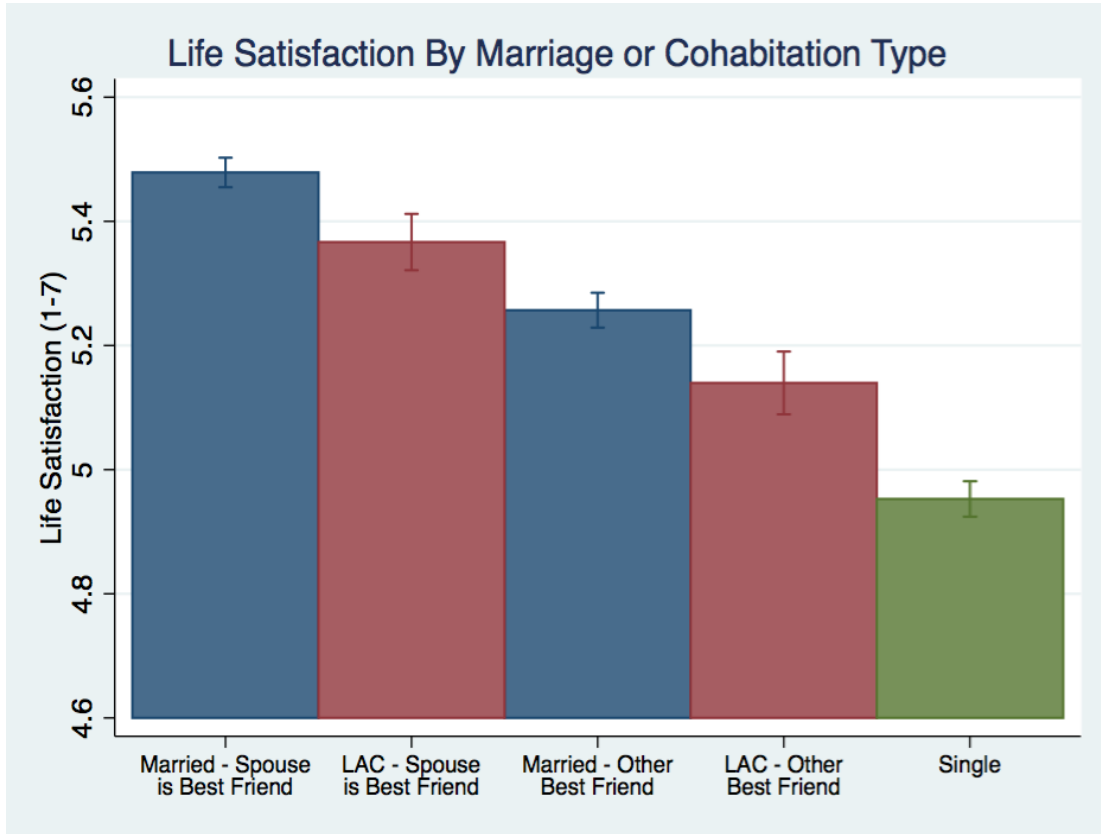


Figure 6: Life Satisfaction By Marriage or Cohabitation Type (Excluding Previous Life Sat. Controls)

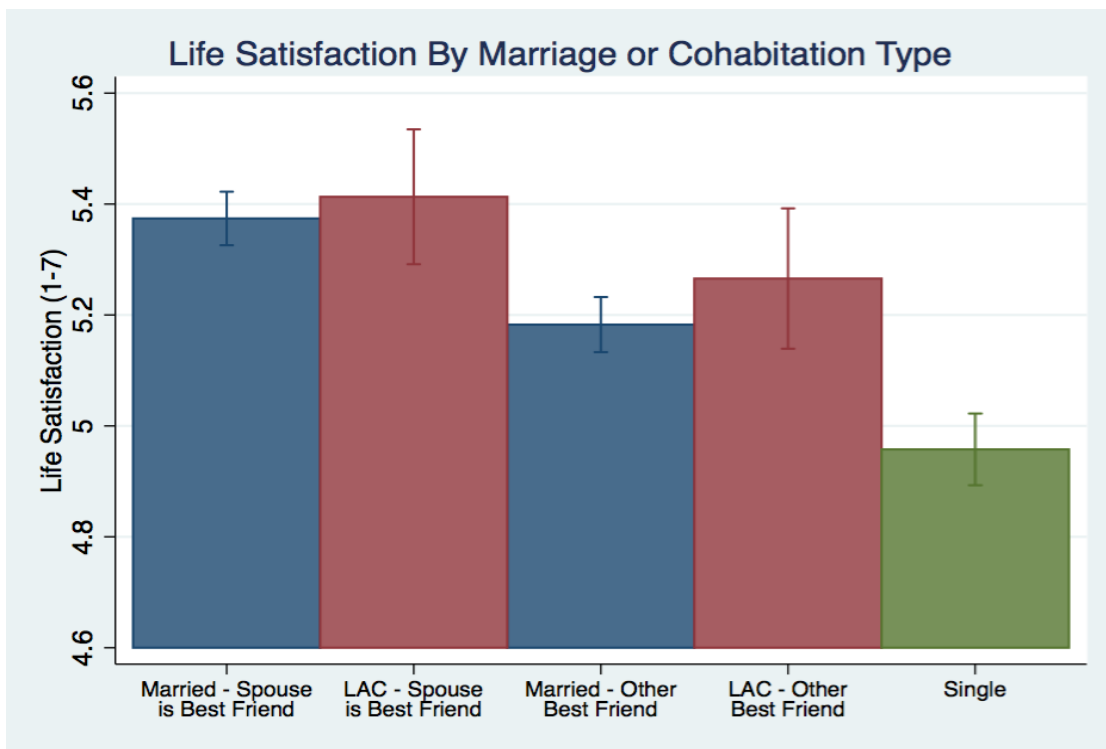


Figure 7: Life Satisfaction By Marriage or Cohabitation Type (Including Previous Life Sat. Controls)

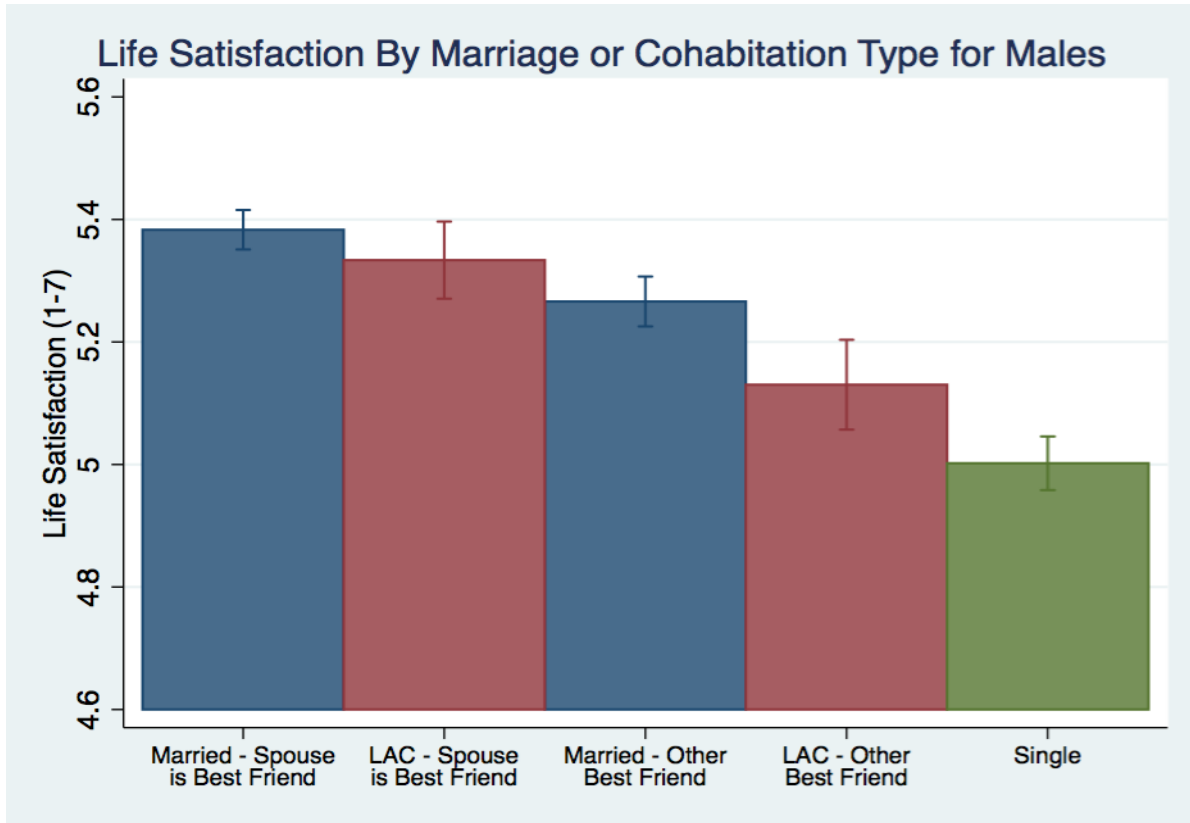
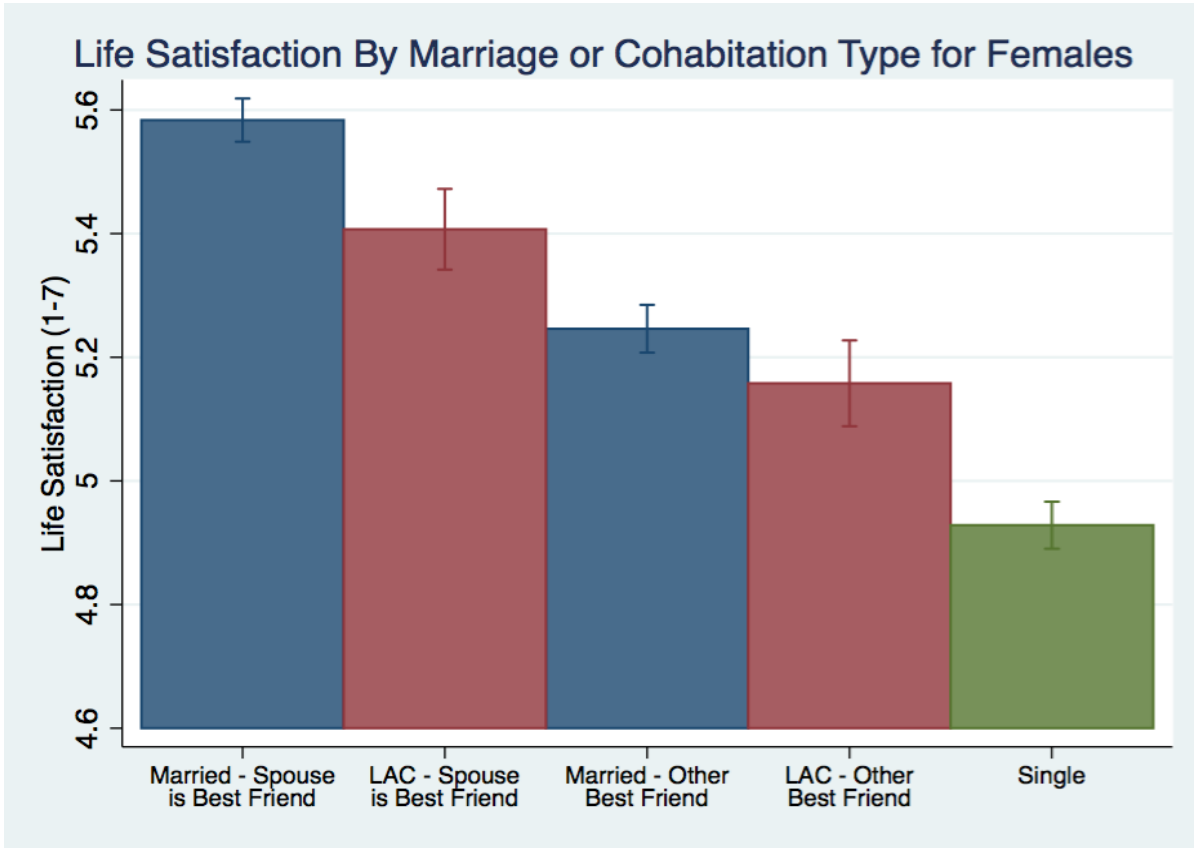


Figure 8: Life satisfaction by relationship type and best friend divided by gender

Appendix A: Well-being U-Shape by Geographic Region

Note: y-axis scales vary by region to reflect differences in overall well-being levels

