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# DO PEOPLE REALLY ADAPT TO MARRIAGE?*

ABSTRACT. Although cross-sectional studies have shown a reliable association between marital status and subjective well-being, a recent longitudinal study [Lucas et al. 2003, Journal of Personality & Social Psychology 84(3), pp. 527–539] found no support for the idea that happiness increases after marriage. Instead, participants who got married reported short-term increases followed by complete adaptation back to baseline levels of well-being. However, researchers have criticized this study on two grounds. First, these results contradict cohort-based analyses from a nationally representative sample. Second, these analyses do not control for pre-marriage cohabitation, which could potentially inflate baseline levels of well-being. The original data (plus four additional waves) are reanalyzed to address these concerns. Results confirm that individuals do not get a lasting boost in life satisfaction following marriage.

KEY WORDS: subjective well being, marriage, adaptation, happiness, setpoint theory

## INTRODUCTION

An important goal for subjective well-being research is to identify the factors that lead to high levels of life satisfaction and positive affect. For decades, researchers have approached this goal primarily using cross-sectional techniques (for a review, see Diener et al., 1999). Large samples of individuals have been recruited, and numerous demographic variables have been assessed. These studies generally support the counter-intuitive finding that life circumstances tend to have a small impact on subjective well-being. Factors such as income, health, education, gender, and age all exhibit weak associations with well-being

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outcomes. These findings have led some to suggest that people can adapt to almost any life circumstance or life event. Thus, most of the variance in well-being reports would be due to stable, genetically determined factors including personality traits (e.g., Lykken and Tellegen, 1996). In turn, these results suggest that there is very little that individuals can do to create lasting changes in their happiness.

For instance, in one of the most famous studies of adaptation to life events, Brickman et al. (1978) recruited samples of individuals who had won large sums of money in a lottery or who had suffered serious spinal-cord injuries that resulted in paraplegia or quadriplegia. Although the spinal-cord injured group were significantly less happy than both the lottery winners and a group of matched controls, many have claimed that the differences were not as large as would be expected. These results suggest that a great deal of adaptation to both positive and negative life events can occur. Unfortunately, the primary source of data used to arrive at this conclusion is somewhat limited. Cross-sectional studies, while providing an important first step in a program of research, tell us little about how variables change over time.

Recently, psychologists have turned to large-scale panel studies to answer questions about the effects of life events on happiness. These studies track large samples of individuals for very long periods of time. Such studies allow for prospective, longitudinal analysis of change in well-being before and after important life events. For instance, Lucas et al. (2004) used a nationally representative panel study (the German Socio-Economic Panel Study; GSOEP; see Haisken-De New and Frick, 2003) to track changes in life satisfaction before and after unemployment. Existing cross-sectional research consistently shows that individuals who have been unemployed in the past are less happy than individuals who have never been unemployed. However, this cross-sectional effect could be due to real change following the event or to pre-existing differences between the groups. Lucas et al. showed that the experience of unemployment was in fact associated with lasting changes in subjective well-being. Individuals who experienced a bout of

unemployment reported a drop in happiness while unemployed, and then happiness levels rebounded slightly following re-employment. However, these levels did not return to their initial baseline. Instead, previously unemployed individuals reported long-term decreases in happiness following the event.

Although the results from Lucas et al.'s (2004) study correspond well with previous cross-sectional findings, this is not always the case. For instance, Lucas et al. (2003) investigated the extent to which individuals adapt to a positive life event – the experience of marriage. Previous cross-sectional research has consistently shown that marital status tends to be one of the strongest demographic correlates of subjective well-being (e.g., Haring-Hidore et al., 1985; though see DePaulo and Morris, 2005, for a critical perspective on this literature). Married people tend to be happier than single people, who, in turn, tend to be happier than widowed and divorced people. This cross-sectional finding naturally leads to the question of whether marital events cause changes in happiness, or whether selection effects are responsible for these differences. Given that marital events are not completely exogenous (see, e.g., Jocklin et al., 1996; Johnson et al., 2004), it is possible that cross-sectional differences may be due to pre-existing differences among these groups. Happy individuals may be more likely to get and stay married, whereas less happy individuals may be more likely to stay single or to get divorced (Johnson and Wu, 2002; Hope et al., 1999).

To test various explanations of the marriage effect, Lucas et al. (2003) tracked a sample of 1761 individuals who got married during the first 15 years of the GSOEP study. They found that individuals experienced a slight boost in life satisfaction in the first year of marriage. However, this boost dissipated fairly quickly, and married individuals' long-term level of satisfaction after marriage was no different than the long-term average before marriage. In other words, on average, people adapted to this positive event. Lucas et al. argued that the cross-sectional difference between married and never married individuals was due to selection effects (also see Stutzer and Frey, in press). Individuals who would eventually marry were happier than average even before their marriage occurred. In support of this explanation, Lucas (in

press) further showed that single individuals who will eventually get and stay married are happier before marriage than single individuals who will eventually marry and then divorce.

**Concerns About the Adaptation Effect**

Although this longitudinal evidence from a nationally representative panel study provides strong evidence that happiness levels do not change following marriage, these results are certainly not conclusive. In fact, researchers have questioned these results on a number of grounds. For instance, Easterlin (2003) argued that the longitudinal results that Lucas et al. (2003) presented are not consistent with existing cross-sectional evidence or with analyses examining cohorts of individuals over time. Specifically, Easterlin examined cohorts of young adults in a long-running, nationally representative (but not longitudinal) study conducted from 1972 to 2002 in the U.S. He noted that as cohorts age from their late teens to their late 20s, the percentage of people within those cohorts who are married rises dramatically, from about 10% to about 60%. In addition, during the same part of the lifespan, happiness levels also rise, at least in the data he examined. Easterlin suggested that because married people are consistently happier than never married people at all age levels, the positive trend with increasing age is likely due to the transition of greater numbers of participants into the married group. He further noted that the average happiness of single individuals in these cohorts does not change as the cohorts age. This relatively stable trajectory of happiness, in turn, argues against a selection effect. If the happiest individuals were selecting into marriage, the average happiness of single adults should decline as the happiest people leave the group.

However, a close examination of these data reveals that the results from Easterlin's (2003) study are not necessarily at odds with those reported in Lucas et al. (2003). Easterlin interprets the selection hypothesis to mean that, on average, unmarried individuals' happiness should decline as the happiest singles enter marriage. However, this prediction will only hold if there are no additional age-related changes in happiness that are independent of marriage. If, on the other hand, there was a

general positive trend that was unrelated to marriage, a selection effect could produce the exact pattern that Easterlin (2003) reported. For instance, if happiness increases from age 18 to 29 for reasons unrelated to marriage, and if the happiest people moved from the single group to the married group (but received no additional boost from this change in life circumstances), then both the mean of the married group and the overall mean would increase as a result of this general trend. However, the happiness of unmarried individuals would remain stable because the general upward trend would be balanced by the happiest people leaving this group. This is the exact pattern that Easterlin reports. Just as the overall mean increases, the happiness of married people also increases from age 18 to age 29. This increase in happiness among married individuals cannot be explained by transitions into marriage.

Cohort analyses cannot determine whether transitions into marriage are responsible for the increases in happiness that Easterlin (2003) reports. Although it is true that marriage rates increase dramatically from age 18 to age 29, many other changes occur as well (Rindfuss, 1991). For instance, Figure 1 uses the same data that Easterlin (2003) used in his study (the General Social Survey, a yearly or biyearly nationally representative survey in the U.S.; Davis et al., 2003) to show age-related changes in the percentage of respondents who are married or employed

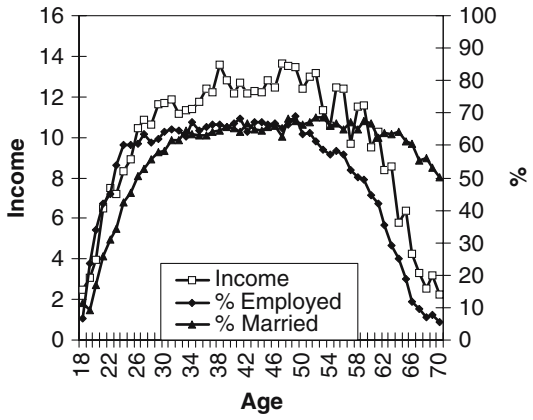


*Figure 1.* Changes in marital status, employment status, and income across different ages.

in a full-time job, along with average respondent income (on a 23-point scale).[1] All three variables increase very rapidly from age 18 to age 29. Furthermore, Table I shows that these four variables are so highly intercorrelated (when aggregated within age) that it will be virtually impossible to tease apart which effect is responsible for the corresponding age-related changes in happiness using aggregated cohort analyses. Although the changes over time may be due to changes in the percent of people who are married, they may also be due to any number of other factors that are changing in similar ways at this time.[2]

It is also important to point out that additional data from the GSS do not support the conclusion that happiness levels of a sample are related to the percent of people in that sample who are married. To demonstrate, we turned to a type of analysis that is often used by researchers investigating the association between income and happiness. These researchers often point to the lack of correspondence over time between changes in a country's per capita Gross Domestic Product (GDP) and the average happiness of its citizens (e.g., Diener et al., 1999). These analyses tend to show that although real income has increased dramatically over the years, happiness levels have remained stable. However, it is also possible to plot trends in marriage rates against happiness in a similar way. If marriage causes a lasting increase in happiness (and marital dissolution causes a lasting decrease in happiness), average happiness should be affected by falling marriage rates. However, Figure 2 shows that this is not the case. The proportion of people who are married in the GSS dropped from a high of 72% in 1972 to a low of 45% in 2000. At the same time, average happiness levels remained almost

TABLE I
Correlations between age, percent married, percent working, and average income (aggregated within age) among 18- to 29-year-olds

| | Age | % Married | % Working | Income |
|---|---|---|---|---|
| Age | 1.00 | | | |
| % Married | 0.90 | 1.00 | | |
| % Working | 0.99 | 0.92 | 1.00 | |
| Income | 0.98 | 0.93 | 0.99 | 1.00 |

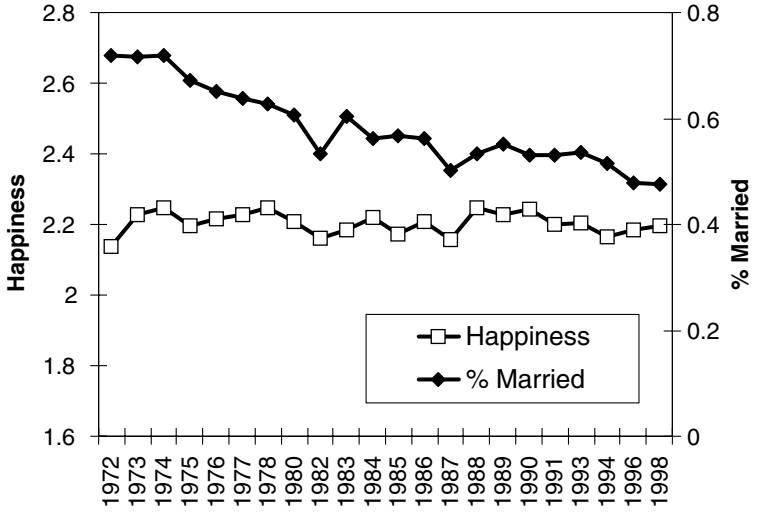


*Figure 2.* Marriage rates and average happiness over time.

perfectly stable, hovering around 2.2. If marriage caused lasting changes in happiness, we should expect to see a steady decline in happiness as marriage rates fell over the years.[3]

Easterlin (2003) suggested that the data from the German panel study were not consistent with existing cross-sectional and cohort analyses. The analyses presented above suggest that this is not necessarily the case. However, it is still possible to go on to ask exactly what is different about the two data sets. For instance, the results presented in the two papers use different types of data (longitudinal versus multiple years of cross-sectional data), different types of analyses (multi-level modeling versus an examination of means), and samples from different nations (Germany versus the U.S.). Additional analyses can determine which factor is responsible for the discrepant results.

If the analytic approach is responsible for the differences, we should find similar age-related changes in the German study when simpler analyses are used. However, a simple examination of age-related changes in happiness shows that the basic results from the GSS are not replicated in the German sample. Even though marriage rates also increase from the late teens to the late 20s in the German study, happiness is relatively stable and may even decline during this period (Donnellan et al., in

preparation). Thus, the basic cross-sectional result from the GSS is not replicated in the GSOEP, suggesting that the multilevel modeling analyses used in Lucas et al. (2003) are not responsible for the different results.

Of course, if the results vary across two nations, we can ask whether one of these nations (or studies) is anomalous. Donnellan et al. (in preparation) also analyzed age differences in a second large-scale, nationally representative panel study (the British Household Panel Study), and again, they found that life satisfaction levels do not increase from the late teens to the late 20s. Thus, a pattern opposite to that found in the GSS is replicable across two large samples from two different European countries.

As a final test of the robustness of this effect, we turned to the 2002 World Values Survey (Inglehart, 2003), which includes large, nationally representative samples from 80 nations around the world. We used multilevel modeling to estimate the cross-sectional effect of age within each nation.[4] This analysis provides an estimate of the overall trends in happiness across different age groups, while simultaneously testing whether these trends vary significantly among the 80 nations. Results showed that in contrast to the results from the GSS (but in accordance with the results from the GSOEP and BHPS), happiness levels declined slightly from age 18 to age 29 even though marriage rates increased, $B = -0.003$, $SE = 0.001$, $t = -2.536$, $p < 0.05$. Importantly, the estimates from the multilevel model showed that the variance component for the age slope was not significantly greater than zero, variance component = 0.00001, $\chi^2$ (79) = 100.22, *ns*. This means that the slopes do not vary significantly across nations. Even in the U.S. sample there is a non-significant (but higher than average) trend towards lower satisfaction from age 18 to age 29, $B = -0.015$, $SE = 0.010$, $t = -1.566$, *ns*. Thus, there is a replicable trend towards decreasing levels of happiness from the late teens to the late 20s, but this trend is reversed in the GSS.

In a separate paper, Easterlin (2005) also suggested that the results reported in Lucas et al. (2003) may be due to the failure to control for cohabitation before marriage. Specifically, because cohabitation is common in Germany, and because pre-marriage

cohabitation may provide the same benefits as marriage, the estimate of baseline satisfaction may be artificially inflated. Thus, there may be a lasting effect of marriage, but this effect may be masked by the artificially high baseline. This is certainly a reasonable alternative explanation of the initial results, and thus, the remainder of this paper will focus on testing this hypothesis. If the appearance of adaptation is due to high levels of cohabitation during the baseline period, then post-marriage happiness should be higher than baseline levels once pre-marriage cohabitation is controlled. This also serves as an opportunity to replicate the results reported in Lucas et al. with four additional waves of data and a larger sample size.

## METHOD

### Participants

The data in this study come from Waves 1–19 of the GSOEP, a longitudinal study of private households and individuals living in Germany (see Haisken-De New and Frick, 2003, for a detailed description of the study and its sample). Households were selected using multi-stage random and systematic sampling, and each household member who was aged 16 or older was asked to participate. Surveys were conducted yearly using face-to-face interviews with self-completion portions. The entire sample comprises 39,987 respondents who participated in at least one of the waves. These participants were recruited from seven different sub-samples: A West German sample (recruited in 1984), an East German sample (recruited in 1990), an immigrant sample (recruited in 1994 and 1995), a refreshment sample (recruited in 1998), an ''innovation'' sample (recruited in 2000), and a high-income sample (recruited in 2002). Household response rates in the first waves ranged from 61% (in the West German sample) to 70% (in the East German sample). Average yearly attrition rates ranged from 5.68% (in the East German sample) to 15.70% (in the Innovation sample).

Participants who began the survey unmarried (including those who were never married, widowed, or divorced), became married at some point during the 19 years of the study, and remained

married until the final wave of the study were selected for the analysis. Two thousand two hundred thirty participants (50% female, average age at marriage = 29.87) met this criterion.

**Measures**

Each year, participants completed a lengthy questionnaire focusing mostly on economic conditions in their lives. The two variables of interest for the current study were marital status and life satisfaction. The life satisfaction measure was a single item that asked participants to rate how satisfied they were with their life as a whole. Participants responded using a scale that ranged from 0 (''completely dissatisfied'') to 10 (''completely satisfied''). Because there were mean-level trends over time (some associated with the fall of the Berlin Wall), scores were centered within each sub-sample within each year. However, results are very similar when uncentered scores are used (full results are available on request).

**Analytic Strategy**

To test whether people adapt to marriage even after controlling for the effect of pre-marriage cohabitation, we used a multi-level modeling strategy (estimated using HLM 6.0; Raudenbush et al., 2004). This approach allows for the investigation of within-person trends in satisfaction before and after the event of marriage. In addition, this approach allows us to test whether person-level variables moderate these within-person trends.

We tested two models that varied in complexity. First, to determine whether long-term levels of well-being changed following marriage, we tested a very simple model that examines change in average satisfaction across three distinct periods. The baseline period comprises all years that are at least two years prior to an individual's marriage. The reaction period comprises the year before, the year of, and the year after marriage. Finally, the adaptation period comprises all years that are at least two years after an individual's marriage. For each individual who met the selection criteria, two dummy coded variables were created to examine change across these three periods. The Reaction variable was coded 1 in the year before marriage, the year of marriage, and the year after marriage. This variable was

coded 0 in all other years. The Adaptation variable was coded 1 in all years that were at least two years after marriage and 0 in all others. Therefore, the level-1 model predicting changes in life satisfaction was:

$$\text{Life Satisfaction} = \beta_0 + \beta_1 * \text{Reaction} + \beta_2 * \text{Adaptation} + r$$

Each of the level-1 parameters was predicted from two person-level variables: age and a dummy-coded sex variable (which were both centered so that the parameters reported in the text reflect results for the average person). Dummy-coded variables indicating whether a person had ever been divorced or widowed were also included. However, once age was included in the model, the estimated parameters for these variables were never significantly different from zero. Therefore, these variables were not included in any of the final models. The level-2 equations predicting the level-1 parameters were:

$$\beta_0 = \gamma_{00} + \gamma_{01} * \text{Sex} + \gamma_{02} * \text{Age} + u_0$$

$$\beta_1 = \gamma_{10} + \gamma_{11} * \text{Sex} + \gamma_{12} * \text{Age} + u_1$$

$$\beta_2 = \gamma_{20} + \gamma_{21} * \text{Sex} + \gamma_{22} * \text{Age} + u_2$$

The $\gamma_{00}$, $\gamma_{10}$, and $\gamma_{20}$ parameters reflect the weighted average $\beta$s with the corresponding subscript. For instance, $\gamma_{00}$ is the weighted average $\beta_0$, which can be interpreted as the weighted average age of each individual's average level of life satisfaction during the baseline phase (when Reaction and Adaptation are 0). The parameter $\gamma_{10}$ is the weighted average $\beta_1$, which can be interpreted as the weighted average change in life satisfaction that occurs during the reaction period. The parameter $\gamma_{20}$ is the weighted average $\beta_2$, which can be interpreted as the weighted average change in life satisfaction that occurs during the adaptation period. If there is full adaptation, the $\gamma_{20}$ parameter should be non-significantly different from zero, showing that long-term levels of satisfaction are no different after marriage than they were before marriage. The other $\gamma$ parameters reflect

the extent to which person-level variables moderate these within-person effects. For instance, the $\gamma_{11}$ parameter reflects the extent to which the change that occurs from baseline to the reaction period depends on one's age.

The effect of cohabitation can be assessed by adding an additional time-varying covariate to the level-1 equation. Specifically, a dummy-coded cohabitation variable (where 0 = not cohabitating and 1 = cohabitating) can be entered. If this parameter is significantly different from zero, then it shows that cohabitation has an effect on life satisfaction. More importantly, however, the inclusion of this variable changes the interpretation of the intercept or baseline parameter. The baseline parameter reflects the average level of satisfaction when all other variables are zero. Therefore, after the dummy-coded cohabitation variable is entered into the equation, the baseline parameter now reflects the average level of satisfaction in all years that are at least two years before marriage *and* during which the person was not cohabitating. Thus, the adaptation parameter (which reflects the change from baseline) now reflects the change from a non-cohabitating baseline.

Although this model can determine whether long-term levels of satisfaction change following marriage, it does not provide a precise estimate of the yearly changes that occur over time. For that reason, a more complicated model will also be tested. This more complicated model includes six variables: An intercept, linear, and quadratic term for the periods before and after marriage. This model estimates peak happiness immediately before and after marriage, along with the rate of change before and after the event. As with the simpler model, the cohabitation parameter can be added to see how its inclusion affects the estimated trajectories. In addition, age and sex can be included as level-2 moderators of the level-1 effects.[5]

## RESULTS

Results for the reaction/adaptation models (with and without cohabitation) are presented in Table II. Because sex was not significantly associated with any of the level-1 parameters, it was dropped from both models. The left side of the table

TABLE II
Estimated parameters from the reaction and adaptation model

| Effect | Without cohabitation | | | With cohabitation | | |
|---|---|---|---|---|---|---|
| | $\gamma$ | S.E. | $t$ | $\gamma$ | S.E. | $t$ |
| Baseline, $\beta_0$ | | | | | | |
| Intercept, $\gamma_{00}$ | 0.29* | 0.03 | 10.27 | 0.25* | 0.03 | 7.33 |
| Age, $\gamma_{01}$ | −0.02* | 0.00 | −5.08 | −0.02* | 0.00 | −4.33 |
| Reaction, $\beta_1$ | | | | | | |
| Intercept, $\gamma_{10}$ | 0.23* | 0.03 | 8.17 | 0.26* | 0.03 | 8.50 |
| Age, $\gamma_{11}$ | 0.01* | 0.00 | 3.11 | 0.01* | 0.00 | 2.79 |
| Adaptation, $\beta_2$ | | | | | | |
| Intercept, $\gamma_{20}$ | −0.02 | 0.03 | −0.69 | 0.02 | 0.04 | 0.57 |
| Age, $\gamma_{21}$ | 0.01* | 0.00 | 2.63 | 0.01* | 0.01 | 2.41 |
| Cohabitation, $\beta_3$ | | | | | | |
| Intercept, $\gamma_{30}$ | | | | 0.08* | 0.03 | 2.85 |
| Age, $\gamma_{31}$ | | | | 0.00 | 0.00 | 0.42 |

*Note*: N = 2230; *$p < 0.05$.

reports the estimated parameters for a model that replicates the analyses from Lucas et al. (2003). As in those initial analyses, cohabitation was not included. Not surprisingly, the average parameters are almost identical to those reported in the original paper, even though the current analyses includes approximately 450 additional participants and four additional waves of data. Participants who will eventually marry report satisfaction scores that are significantly higher than the average for the full GSOEP sample. Satisfaction scores increase by 0.23 points in the years surrounding marriage. Finally, satisfaction scores drop back to baseline in the years following the event. As in the original paper, the adaptation parameter is very small and non-significantly different from zero. This suggests that, on average, adaptation was complete.

The right-hand side of Table II reports the results from a model that includes the dummy-coded cohabitation variable. The significant cohabitation parameter shows that individuals report higher levels of satisfaction (about 0.08 points on a 0−10 scale) when cohabitating than they do when they are not cohabitating. However, the other parameters in the model barely change with the inclusion of this variable. Baseline levels of

satisfaction are still significantly higher than average. And most importantly, the adaptation parameter is almost identical to the estimate from the model without cohabitation (0.02 versus −0.02 in the original model). Again, this estimate is not significantly different from zero. Thus, even after controlling for cohabitation, adaptation to marriage is, on average, complete. Figure 3 shows estimated trajectories across the three periods for the full sample (solid line) and for individuals who do or do not cohabitate during the baseline period (dashed lines).[6]

Results for the quadratic trend models (again, with and without cohabitation) are presented in Table III. In the model without cohabitation, the intercept, linear, and quadratic trends are all significant, both before and after marriage. The predicted trajectory based on these estimates is plotted as a solid line in Figure 4. These estimates suggest that satisfaction levels increase before marriage, peaking around 0.57 in the first year of marriage. After marriage, satisfaction drops at first, but then levels off over time. Although the quadratic trend models do not provide a direct test of the adaptation hypothesis (because predicted levels of satisfaction change continuously), a visual inspection of Figure 4 suggests that satisfaction levels are not different after the event than they were before.

Including the cohabitation variable in the model does not change this conclusion. The right side of Table III shows the estimated parameters with cohabitation in the model. After the inclusion of this variable, the only noticeable change in the

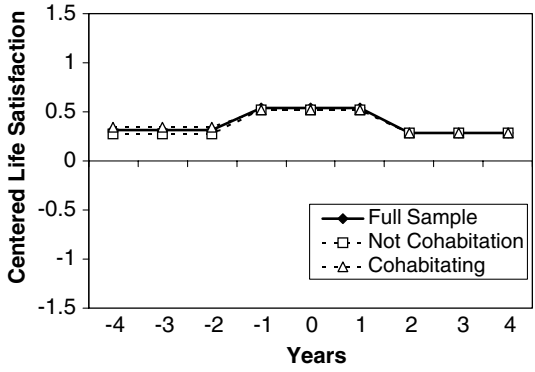


*Figure 3*. Predicted trajectories from the reaction/adaptation model.

TABLE III
Estimated parameters from the linear trend model

| Effect | Without cohabitation | | | With cohabitation | | |
|---|---|---|---|---|---|---|
| | $\gamma$ | S.E. | $t$ | $\gamma$ | S.E. | $t$ |
| Before, $\beta_0$ | | | | | | |
| Intercept, $\gamma_{00}$ | 0.44* | 0.03 | 14.28 | 0.32* | 0.04 | 8.39 |
| Sex, $\gamma_{01}$ | 0.01 | 0.06 | 0.18 | −0.02 | 0.08 | −0.25 |
| Age, $\gamma_{02}$ | −0.01* | 0.00 | −2.90 | −0.01* | 0.00 | −3.00 |
| Before linear, $\beta_1$ | | | | | | |
| Intercept, $\gamma_{10}$ | −0.07* | 0.01 | −6.34 | −0.06* | 0.01 | −5.38 |
| Sex, $\gamma_{11}$ | 0.02 | 0.02 | 0.91 | 0.02 | 0.02 | 1.00 |
| Age, $\gamma_{12}$ | 0.00 | 0.00 | 0.18 | 0.00 | 0.00 | 0.27 |
| Before quadratic, $\beta_2$ | | | | | | |
| Intercept, $\gamma_{20}$ | 0.01* | 0.00 | 5.79 | 0.01* | 0.00 | 5.29 |
| Sex, $\gamma_{21}$ | −0.00 | 0.00 | −0.85 | −0.00 | 0.00 | −0.88 |
| Age, $\gamma_{22}$ | −0.00* | 0.00 | −2.14 | −0.00* | 0.00 | −2.13 |
| After intercept, $\beta_3$ | | | | | | |
| Intercept, $\gamma_{30}$ | 0.57* | 0.03 | 19.33 | 0.57* | 0.03 | 19.34 |
| Sex, $\gamma_{31}$ | 0.14* | 0.06 | 2.42 | 0.14* | 0.06 | 2.43 |
| Age, $\gamma_{32}$ | −0.01* | 0.00 | −2.06 | −0.01* | 0.00 | −2.06 |
| After linear, $\beta_4$ | | | | | | |
| Intercept, $\gamma_{40}$ | −0.07* | 0.01 | −8.85 | −0.07* | 0.01 | −8.94 |
| Sex, $\gamma_{41}$ | −0.01 | 0.02 | −0.72 | −0.01 | 0.02 | −0.73 |
| Age, $\gamma_{42}$ | 0.00 | 0.00 | 1.15 | 0.00 | 0.00 | 1.12 |
| After quadratic, $\beta_5$ | | | | | | |
| Intercept, $\gamma_{50}$ | 0.00* | 0.00 | 4.52 | 0.00* | 0.00 | 4.56 |
| Sex, $\gamma_{51}$ | −0.00 | 0.00 | −0.42 | −0.00 | 0.00 | −0.42 |
| Age, $\gamma_{52}$ | −0.00 | 0.00 | −1.74 | −0.00 | 0.00 | −1.72 |
| Cohabitation, $\beta_6$ | | | | | | |
| Intercept, $\gamma_{60}$ | | | | 0.17* | 0.03 | 5.18 |
| Sex, $\gamma_{61}$ | | | | 0.03 | 0.06 | 0.46 |
| Age, $\gamma_{62}$ | | | | 0.00 | 0.00 | 0.59 |

*Note*: N = 2230; *$p < 0.05$.

parameters is in the pre-marriage intercept, which drops from 0.44 to 0.32. Although this changes the predicted trajectory (see the dashed lines in Figure 4), conclusions about adaptation do not change dramatically. If marriage is associated with lasting changes in satisfaction, these changes are not large.

It is important to point out that there is one difference between the results from Lucas et al. (2003) and those from the

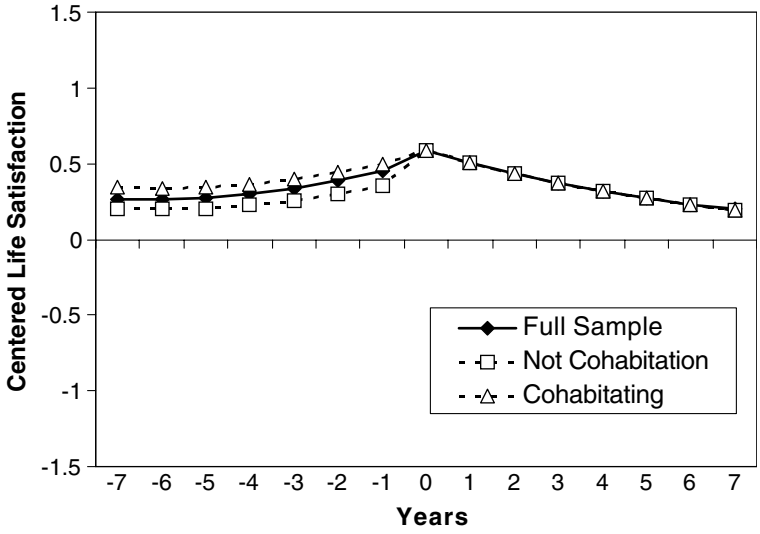


*Figure 4*. Predicted trajectories from the quadratic trend model.

current analyses. In contrast to the results from the original paper, age was significantly associated with satisfaction levels in both the reaction/adaptation model and the quadratic trend model. Older participants reported lower levels of baseline satisfaction along with more positive changes during the reaction and adaptation periods than did younger participants. For instance, those participants who marry at an early age (e.g., 1 standard deviation below the mean age at marriage, or at about 21 years of age) report non-significantly lower levels of happiness after marriage than they did before marriage. Participants who marry at a later age (e.g., at age 38), on the other hand, report significant and lasting increases in happiness after marriage (though even for these individuals, the long-term boost in satisfaction following marriage is a relatively small 0.13 difference). Thus, conclusions about the extent of adaptation depend somewhat on the age at which one marries.

## DISCUSSION

No type of data is perfect, and no single analysis can unequivocally answer a complex scientific question. However, certain

types of data allow for stronger inferences than others. Cross-sectional techniques play an important role in the initial stages of a scientific investigation. These studies can quickly and efficiently identify robust associations between predictors and outcomes, and they can provide researchers with the descriptive data that are needed to formulate hypotheses about underlying processes. But cross-sectional data have serious limitations, and once hypotheses about underlying processes have been formulated, more sophisticated designs are required.

Within the field of subjective well-being, cross-sectional research suggests that marriage may play a causal role in one's happiness and life satisfaction. Married people are consistently happier than unmarried people, and these effects remain even after a variety of additional demographic factors are controlled. However, more sophisticated longitudinal analyses have failed to provide support for this causal hypothesis. Lucas et al. (2003) showed that people do not get a lasting boost in happiness when they get married. Instead, married individuals return to their pre-marriage baseline levels of life satisfaction within a few years.

Easterlin (2003, 2005) suggested that this result is suspect for two reasons. First, he argued that the failure to find an effect of marriage contradicts his own cohort analyses conducted with very large, nationally representative samples assessed over a period of 30 years. Easterlin showed that as these cohorts age from their late teens to their late 20s, more and more individuals within the cohorts get married; and during this same time, the average happiness of the cohorts increases. He suggested that the increase in happiness is due to the increase in the number of people who are married. This conclusion, however, is an example of the ecological fallacy (Freedman, 2001). Analyses of aggregated variables allow for very limited inferences about the associations between the same variables at the individual level. A positive association between two aggregated variables may disappear or even reverse when those same two variables are examined using disaggregated data (see Freedman, 2001, for examples). In the current paper, we showed that Easterlin's data are not inconsistent with Lucas et al.'s (2003) longitudinal

results. But even if they were, this would be reason to be suspicious about the aggregated data, not the longitudinal data. To understand within-person change, it is necessary to follow individuals over time.

Easterlin (2005) also suggested that the results from Lucas et al. (2003) may be misleading because they did not control for cohabitation. If individuals already receive the benefit of marriage during a period of cohabitation, then their pre-marriage baseline would be artificially inflated. This would, in turn, lead to an underestimation of the lasting benefits of marriage. However, the new analyses presented in this paper showed that even after controlling for the significant effect of cohabitation, adaptation was still, on average, complete. Participants in this study were no happier after marriage than they were before marriage. Thus, these results provide further support for the idea that marriage does not cause lasting changes in happiness.

One important moderator did, however, emerge in these new analyses. In contrast to the results from the original paper, age emerged as a significant predictor of the baseline, reaction, and adaptation parameters. Individuals who married at a later age reported lower levels of initial satisfaction (when compared to individuals who married at a younger age) followed by greater increases in satisfaction in the reaction and adaptation periods. For the most part, this new effect does not change the original conclusions about adaptation to marriage. Only the relatively small percentage of participants who marry after their mid-30s reported significant increases in satisfaction, and even these changes were not very large.

The significant moderating effect of age may, however, change the interpretation of the elevated levels of satisfaction reported by individuals who will eventually marry. Although Lucas et al. (2003) initially interpreted this as a selection effect, the higher-than-average baseline levels may be due to the fact that happiness levels tend to be slightly elevated in young adulthood (Donnellan et al., in preparation). This age effect is not large; and in fact, it was not significant in the initial analyses even with almost 1800 participants. But with the larger sample size included in this paper, the effect became significant. Thus, it

is necessary to qualify the original conclusion by stating that pre-marriage levels of satisfaction may be elevated simply because these pre-marriage years tend to occur when participants are in their early to mid-20s. However, it is also possible that this is a true selection effect that is moderated by age. It may be that individuals who marry when young are, in fact, happier than average, but this effect does not occur among individuals who marry later in life. Future research is needed to tease apart these effects.

It is also important to note that selection effects do still receive support when more explicit group-based comparisons are made. For instance, Lucas (in press) found that individuals who will eventually get and stay married are happier than individuals who will eventually marry and then divorce, even though the two groups are similar in age. Furthermore, the difference between these two groups was not eliminated when age differences were controlled. Thus, although the current study raises some questions about whether individuals who will eventually marry are happier than those who will not, Lucas's (in press) study comparing those who stay married to those who eventually divorce suggests that there are prospective differences between these groups that cannot be explained by age.

Of course, all of these analyses are limited by the fact that they come from a single study. And although this study includes a very large, nationally representative sample of participants who have been followed for 19 years, these results need to be replicated. It is possible that in other samples or using other measures, evidence for incomplete adaptation will emerge. In addition, it is important to emphasize that although these results show that marriage does not cause lasting changes in life satisfaction, this does not mean that marriage does not have additional benefits beyond its effect on well-being. It is possible that many of the other positive outcomes that have been associated with marriage (including greater income and better health; see Waite, 1995, for a review) do actually result from marriage itself. That being said, it seems clear that in this very large, nationally representative, longitudinal study, the average person does not experience a lasting boost in satisfaction following

marriage. Instead, these individuals experience a short-term increase, followed by a relatively rapid return to baseline levels.

## NOTES

[1] Because of inflation, the GSS uses different income categories in different years. All income analyses are conducted using the 1998 income categories in the 1998, 2000, and 2002 samples.

[2] One could argue that marriage is a more likely candidate as an explanatory variable because marriage is more strongly correlated with happiness than is income. However, this is not the case. Although many psychologists have argued that marital status is a stronger predictor than income, the effect sizes are actually quite comparable (see Lucas and Dyrenforth, 2005, in press, for reviews). For instance, in the GSS, happiness correlates 0.23 with total household income versus 0.17 with a dichotomous never married/married variable (which is the relevant comparison for this argument).

[3] We realize that this reasoning is an example of the ecological fallacy, in which one draws conclusions about individual-level phenomena from aggregated data. However, we use the example to demonstrate that even when this type of aggregated analysis is used, results do not always support an association between marriage and well-being.

[4] One could argue that comparing cross-sectional results from the World Values Survey to cohort-based results from the GSS is inappropriate because the cohort analyses do not confound age and cohort effects. However, when we estimated the effect of age in the GSS using a cross-sectional approach versus Easterlin's (2003) cohort approach, the results were almost identical (full results are available on request). Thus, there do not appear to be cohort effects, at least in the GSS data. In this case, the cross-sectional results provide the same information as the cohort-based analyses.

[5] Although we believe that it is most appropriate to conduct these analyses with the full sample, some might argue that we should limit the analyses to participants who were in the study for many years before and many years after their marriage. We reran all models using only participants who were in the study for at least five years before and five years after their marriage. Results from these analyses were very similar to those reported here.

[6] Because the scale of the axes influences the interpretation of the figures, a decision was made to center figures around the mean and to show approximately one standard deviation above and below the mean.

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