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Happily Ever After? Cohabitation, Marriage, Divorce, and Happiness in Germany

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Abstract

In Germany the life satisfaction of those in first marriages traces the following average course. Starting from a baseline of life satisfaction in noncohabiting years one or more years prior to marriage, those who cohabit prior to marriage have an increase in life satisfaction significantly above the baseline. In the year of marriage and that immediately following, the life satisfaction of those in first marriages, prior cohabitors and noncohabitors combined, increases to a value even further above the baseline, significantly higher than for premarital cohabitors. Thereafter, life satisfaction of those in first marriages drops, but remains significantly above the baseline, at the same level as for premarital cohabitors. Compared with the population generally, those in first marriages are selective with regard to a number of socioeconomic characteristics, but not in regard to personality traits. Those whose first marriage ends in separation or divorce have a life satisfaction trajectory in the years before and during marriage not significantly different from that described above, but separation or divorce reduces this group's life satisfaction to the original baseline value. This group differs significantly from the first marriage population as a whole in its selectivity – lower socioeconomic status and personality traits less conducive to marriage. The roots of prospective dissolution thus apparently lie in this group's distinctive socioeconomic and personality traits, and not in a disparate course of life satisfaction in the first years of marriage.

Introduction

There is a comfortable consensus in the social sciences that marriage has a positive and enduring effect on well-being (for references in sociology and demography, see Waite 1995; Waite and Lehrer 2003; in economics, Frey and Stutzer 2002; Layard 2005). A jarring challenge to this consensus, however, was recently proposed in an award-winning article in a leading psychological journal (Lucas, Clark, Georgellis, and Diener 2003). In a German panel study covering 15 years they find that there is a temporary positive "honeymoon period" effect of marriage, but typically people revert two years after marriage to the same "baseline" level of life satisfaction that prevailed two years before. The psychologists' conclusion is that, "on average, people adapt quickly and completely to marriage" (p. 536). "Adaptation" here means, not that one adjusts to difficulties encountered in living with a partner, but that the hedonic gains from forming a union are transient and quickly disappear.

The significance of this conclusion goes beyond the issue of whether marriage has lasting benefits. The "setpoint theory" in psychology sees individuals as adapting fully to all kinds of life circumstances - job promotion, serious accident, death of a partner, and so on (Kammann 1983; Lykken and Tellegen 1996; Myers 1992, 2000). Lucas and colleagues are testing the setpoint model. In this theory a person's subjective well-being tends to center around a setpoint determined by genetics and personality, and major life transitions and events merely deflect a person temporarily from this level. David G. Myers (2000: 60), a proponent of setpoint theory, quotes favorably the view expressed by the late Richard Kammann (1983:18): "Objective life circumstances have a negligible role to play in a theory of happiness." When Lucas and colleagues state that "people adapt quickly and completely to marriage", they mean that the partners in a marital union fairly quickly return to the happiness level dictated by their personality traits and genetic heritage. (In what follows, subjective well-being, life satisfaction, and happiness, though not identical, are treated as reasonably interchangeable terms.)

A disturbing implication of the setpoint model is that little can be done by personal action or public policy to improve individual well-being. Ed Diener and Richard E. Lucas, two of the authors of the panel study, are quite explicit about this. In an earlier article they state: "The influence of genetics and personality suggests a limit on the degree to which policy can increase SWB [subjective well-being].... Changes in the environment, although important for short-term well-being, lose salience over time through processes of adaptation, and have small effects on long-term SWB" (Diener and Lucas 1999: 227)[1]. Clearly if, in the population as a whole, adaptation to life circumstances is typically rapid and complete, then any measure taken to improve average well-being is fruitless (cf. Easterlin 2003).

In this article, we analyze the same data set as used in the 2003 study by Lucas and colleagues (the German Socio-Economic Panel), but cover 21 waves (1984-2004) compared with their 15 waves (1984-1998).[2] Our sample is of first marriages among previously unmarried persons who married during the survey period and for whom data are available for at least two years before marriage (to establish the premarriage baseline of life satisfaction) and two years after marriage (to test whether there is a return to baseline satisfaction after the "honeymoon period"). Our sample includes marriages that remain intact during the sample period as well as those that dissolve after two or more years. (Very few marriages dissolve within the first two years.) One might suppose that broken marriages would be characterized by a baseline-to-postmarriage trajectory that is significantly different from that of intact marriages, and that a study confined to "successful" marriages – those still intact at the last

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[1]A gradual retreat by these authors from the view expressed in this 1999 quotation is apparent in later work. In the 2003 article cited here, Lucas and colleagues find that adaptation to widowhood takes eight years. Elsewhere, they conclude that unemployment has a lasting effect on well-being, altering the happiness setpoint (Lucas et al. 2004). Lucas (2005) finds that divorce too reduces life satisfaction, a result seemingly at odds with the finding on marriage (Lucas et al. 2003), which Lucas continues to defend (Lucas and Clark 2006). A proposal by Diener and Seligman (2004) for governmental measurement of subjective well-being suggests numerous ways in which socioeconomic policy might improve well-being.

[2]The data used here were made available to us by the German Socioeconomic Panel Study at the German Institute for Economic Research (DIW), Berlin.

date surveyed – would give too favorable a picture of the effects of marriage. We also examine the effect on subjective well-being of the formation of cohabiting unions before marriage, and we take account of many of the ways in which a sample population of individuals who enter first marriages in the survey period differs from the German Socio-Economic Panel population generally.

Most studies of the effects of marriage and divorce use objective indicators of well-being, but subjective measures are gradually finding acceptance in demographic research (Kohler, Behrman, and Skytthe 2005; Bernhardt and Fratczak 2005; Horwitz, White, and Howell-White 1996; Marks and Lambert 1998; Simon 2002). These measures play a central role in Waite's collaborative work on the well-being effects of dissolution of marital unions (Waite et al. 2002; Waite and Luo 2003).

Previous analyses of the effects of marriage are typically point-of-time studies of the relationship of subjective well-being to marital status, with controls for such factors as income, health, and work status. The repeated conclusion of these cross-sectional studies is that being married has a positive impact on life satisfaction, while being divorced or separated has a negative effect (Argyle 1999; Blanchflower and Oswald 2004b; Frey and Stutzer 2002; Stutzer and Frey 2006). The few panel studies other than that of Lucas and colleagues have also usually supported the consensus on the positive effect of marriage (Johnson and Wu 2002; Mastekaasa 1995). However, these panel studies, like those of Waite and her collaborators, have not included a premarriage baseline period – an important innovation of the Lucas panel study – and therefore do not address the issue of whether well-being in the postmarriage period returns to the premarriage baseline level. The usual explanation of the benefits of marriage – whether measured with objective or subjective indicators – is in terms of "social support", that is, the beneficial effects of companionship, emotional support, sustained sexual intimacy, and so on (Blanchflower and Oswald 2004a; Coombs 1991; Johnson and Wu 2002; Laumann et al. 1994; Powdthavee 2005; Waite and Joyner 2001). There is also recognition that in cross-sectional studies of the relationship of well-

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being to marital status some selection effect may be at work – that persons, say, with "happier" personalities are more likely to marry – but such effects are typically considered to be unable to account for much of the positive association. In contrast to the prevailing view, Lucas and colleagues argue that their results reject the "social support" or "social role" hypothesis. Rather, they believe that the positive relationship of marriage to subjective well-being in the cross-section is attributable to selection into marriage on the basis of personality traits, and that cross-section surveys are capturing some recently married individuals who are still in the temporary "honeymoon"' period.

In what follows we describe our model, data, and methodology, and report our findings. We conclude that the German Socio-Economic Panel data support the conclusion of cross-sectional analyses that the formation of unions – marital or cohabiting – increases happiness and that the dissolution of unions decreases it.

Model, data, and methodology

Our model consists of an intercept and four terms, which describe different life stages for an individual who marries during the sample period. The intercept reflects the average life satisfaction of individuals in the sample in the "baseline" period – all noncohabiting years that are at least one year before marriage (t_1 and before). The first term is a cohabitation term, and it measures, for those who form a cohabiting union prior to marriage, the average difference in life satisfaction from one's baseline value arising from participation in a cohabiting union. The second term, a marriage "reaction" term, measures the average difference in life satisfaction in the first year of marriage (t_0) and the year immediately following (t_{+1}) from one's baseline value. A marriage "adaptation" term measures the average difference in life satisfaction from one's baseline value in the second year after marriage and all subsequent years of marriage (t_{+2} and thereafter). Both the reaction and the adaptation terms are included instead of only one term for "marriage", because we want to test whether there is a

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"honeymoon" effect, that is, whether individuals experience significantly higher levels of life satisfaction during the year of marriage and the year immediately following. The final term, a "divorce" term, measures for those who divorce or separate after two or more years of marriage the difference in life satisfaction from one's baseline value. Our model is structured so that we can test for two key results of the analysis by Lucas and colleagues. The first is whether, two or more years after marriage, individuals who are still married revert to the baseline level of satisfaction that existed before marriage. The second is whether a significant increase in life satisfaction occurs around the time of marriage. But our model is considerably broader, encompassing the life satisfaction effects of the formation and dissolution of unions more generally. Thus, it includes a term reflecting the effect on life satisfaction of cohabitation before marriage. The evidence is considerable that the formation of a cohabitating union has a positive impact on life satisfaction similar to that of marriage, although the magnitude of the effect is sometimes not as great (Stack and Eshleman 1998; Frey and Stutzer 2002). Because cohabitation is fairly prevalent among young Germans, it is possible that Lucas et al.'s estimates of life satisfaction in the baseline period and the year before marriage include a considerable part of the impact of the benefit of forming unions.

The German Socio-Economic Panel contains questions (given here in Appendix A) which, though varying slightly over time, permit us to examine the extent of premarital cohabitation in the sample of first marriages. In the year before marriage, 67 percent of respondents were cohabiting. Among the sample observations two or more years prior to marriage, 29 percent are for persons who were cohabiting. Although we cannot identify partners, it seems likely that a large fraction of our cohabiting observations are of unions with one's eventual marriage partner, because so many of the observations are for unions in the year preceding marriage. Our model also includes a term to test for the impact of marital dissolution on life satisfaction. To see whether life satisfaction follows the same initial course during marriage for those who eventually divorce or separate as for those who do not, we focus on individuals who divorce

or separate after two or more years of marriage (n = 151). In this way we obtain comparable estimates for cohabitation, reaction, and adaptation terms for marriages that remain intact throughout the survey period and those that break up. Some of the marriages that we call "intact" will, of course, eventually dissolve. Excluded from our analysis are the small number of first marriages ending in divorce in the first two years after marriage (n = 2), marriages dissolved by death of a spouse (n = 5), and first marriages of foreign-born persons whose spouse is living in a different country (n = 6). For brevity of presentation, we refer below to the group who do not remain married as the "divorce subgroup", although in our sample of 151 individuals experiencing marriage breakup, only 100 are actually divorced while 51 are separated. Of the 100 divorced, 75 were separated for one or more years before divorce and 25 divorced without first being separated. Our model also takes account of the distinctive socioeconomic characteristics of the first marriage sample. Not surprisingly, this group is younger than the sample population as a whole, by 14 years on average (Table 1, cols. 1 and 2). Younger people are more likely to be better educated, employed, and healthier than average, and this is true for our sample. The first marriage sample is considerably higher too on religiosity. The divorce subgroup differs somewhat from the first marriage sample as a whole in having a larger proportion of females and persons of lower socioeconomic status (col. 3).

Other research has found that life satisfaction tends to vary significantly by sex, age, income, education, health, employment, and religiosity (Argyle 1999; Blanchflower and Oswald 2004b; Frey and Stutzer 2002). To assess the specific impact on life satisfaction of the formation and dissolution of unions, we include controls for these characteristics in our model (except for health because questions on health status were not asked before 1992). Also, to examine whether presence of children affects life satisfaction, we include a variable for the number of children in the household in the year of marriage and thereafter. (The divorce subgroup and those who remained married have virtually the same number of children in the second year after marriage.) A complete description

of the variables is given in Appendix A.

As noted earlier, our data are from waves 1-21 of the German Socio- Economic Panel, covering the years 1984-2004 (Haisken-DeNew and Frick 2005). To our knowledge this is the longest-running panel study to include a measure of subjective well-being. The specific question asked is: "How satisfied are you with your life, all things considered?" Responses are ranked on a scale from 0 (completely dissatisfied) to 10 (completely satisfied). Following Lucas and colleagues' 2003 study, we center life satisfaction scores around the annual mean of each population subsample in the original German Socio-Economic Panel population. This centering technique was chosen to adjust for significant differences in life satisfaction between the subsamples as well as for time trends in life satisfaction. For instance, East Germans were significantly less satisfied than West Germans shortly after unification. The centering procedure eliminates these effects.[3] Our regression analysis employs hierarchical linear modeling, generally considered to be the statistical technique most appropriate for analysis of panel data (Luke 2004; Van der Leeden 1998).[4] Our formal model, including the choice of entering the variables as either random or fixed is spelled out in Appendix B. We test the difference in trajectories for those who remain married and those who will divorce by including a dummy variable in the second level of our hierarchical model that indicates whether an individual belongs to the divorce subgroup. The impact of belonging to the group of people who will eventually divorce is estimated for each slope, except for the "divorced period" slope, which can only be estimated for people who divorce. Sex and religiosity and to some extent education are time-invariant characteristics and thus are

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[3]It is also common to center the dependent variable around the grand mean, although this strategy would not account for annual trends or group differences. We reran the analysis using grand mean centering for the dependent variable and found essentially the same results.

[4]Fixed-effects regression analysis, the preferred method of many economists, yields the same results as hierarchical linear modeling if the same time-variant covariants are included (the fixed-effects framework accounts for time-invariant characteristics). When we also included interaction terms in the fixed-effects regression to test whether the model coefficients differ between individuals who remain married and those who divorce during the sample period, we found essentially the same results as with hierarchical linear modeling.

entered as second-level variables. We found little evidence of a different trajectory by sex. Being male had a significant effect on the intercept and the employment slope, but not on the remaining slopes (Appendix C). An individual's employment status, income, and age vary over time and might alter life satisfaction independent of one's marital situation. We therefore include these time-variant covariates in the first level of our hierarchical model (Appendix B). The detailed regression results are presented in Appendix C.

Findings

The average course of life satisfaction for individuals in intact marriages, who account for over 90 percent of all first marriages in our sample, is shown schematically in Figure 1. The effects found here are comparable in magnitude to those of cross-sectional studies. The baseline value (0.10) of those in first marriage is not significantly different from the value for our German panel population as a whole. In the absence of controls for special socioeconomic characteristics, this group would rank significantly higher on life satisfaction than the general population, but socioeconomic controls eliminate this disparity. If it were possible to control for the greater health of the first marriage group, then the disparity would doubtless be reduced even further.[5]

This result for the baseline value runs counter to the idea that those who marry are distinctive with regard to those personality traits that make one happier and are likely to attract a marriage partner (the traits chiefly suggested in the literature are high extroversion and low neuroticism; see Diener and Lucas 1999). If the first marriage group were selective in regard to such traits, then their baseline life satisfaction value after socioeconomic controls would remain significantly higher than that for the popu-

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[5]Stutzer and Frey (2006: Figure 1) compare singles who will marry with those who will not and find selection effects for those who marry at a young age and those marrying late in life. Their comparison, however, does not control for cohabitation, which may account for the higher life satisfaction of those who will marry.

lation as a whole, reflecting the favorable impact of these traits on life satisfaction. But controls for the distinctive socioeconomic characteristics of those in first marriages put them in essentially the same baseline situation as the general German population and leave no room for the inference that the first marriage group has distinctive personality traits.

As in most previous studies, the formation of cohabiting unions before marriage raises life satisfaction significantly, in this case above the baseline value by 0.183 (Figure 1). In the year of marriage and the year following, a significant boost in life satisfaction occurs for cohabitors and noncohabitors alike, to a value 0.369 above the baseline, a significantly higher value than that for premarital cohabitation. Thereafter, life satisfaction drops back to a value of 0.173, but is still significantly above the baseline. This "marriage adaptation" value is not significantly different from the value for cohabitation, a result not entirely surprising because we are comparing the life satisfaction effects of cohabiting and marital unions for essentially the same partners. (The effect estimated here for cohabitation excludes, of course, cohabitors who did not marry during the survey period.) Thus, we find a "honeymoon period" effect on life satisfaction, followed by a decline, presumably attributable to habituation. However, individuals in marital unions are still happier, on average, than they were in their baseline period.[6]

We find that the formation of successful unions, whether cohabiting or marital, has a positive impact on well-being, but that there is no significant difference in the life satisfaction effect of the two types of unions. The implication appears to be that the crucial element of life satisfaction is finding a compatible partner, whereas the formalization of a union via marriage adds nothing to life satisfaction in terms of long-term well-being. The qualification to this conclusion is that we do not know what the course of life satisfaction would have been in the absence of marriage. We also

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[6]Stutzer and Frey (2006: Table A2), using the German Socio-Economic Panel 1984-2000 and a fixed-effect methodology, compare life satisfaction four or more years after marriage with that four or more years before, and reach a similar conclusion.

point out that these results are averages. The significant variability in the random slope coefficients means that some people might adapt fully to marriage while others might remain at or above the level of their honeymoon period. The divorce subgroup differs from the first marriage group as a whole in two ways. As noted earlier, it is a lower socioeconomic status group; in the absence of controls it has a baseline value significantly less than for the first marriage group. The divorce subgroup also appears to be selective with regard to personality traits conducive to lower life satisfaction. With controls for socioeconomic characteristics, the baseline value of the divorce subgroup remains significantly negative (Appendix C; see also Stutzer and Frey 2006; Lucas 2005).

Our model gives no hint in the life satisfaction trajectory of the divorce subgroup before and during marriage of impending marital dissolution. Although this group starts from a significantly lower baseline value, it experiences effects from premarital cohabitation and from marriage – both in the reaction and adaptation periods – that are not significantly different from those in intact marriages (Appendix C). Thus, the indications of prospective marriage breakup appear to lie in the selective features of the divorce subgroup, and not in a different premarriage-to-postmarriage trajectory. We find no significant effect of children on life satisfaction, either for individuals who remain married or those who do not. (For this reason, we omit children from the final regression results given in Appendix C.) Studies of the life satisfaction effect of children are few and their results mixed (Stutzer and Frey 2006; Kohler, Behrman, and Skytthe 2005). We find in research yet to be published that the reason children have mixed effects on life satisfaction is that their influence is exerted via two channels. On the one hand, children increase satisfaction with family life; on the other hand, the added financial burden of children reduces satisfaction with one's economic situation. The disparate effects of children on the two domains tend to offset each other, leaving overall life satisfaction unchanged. In our model, age has a significant negative effect on life satisfaction. The implication here is that life circumstances other than the formation

of unions, such as circumstances related to health or working conditions, on average reduce life satisfaction. If controls (such as age) for circumstances other than the formation of unions are not included in the regression, the estimate of life satisfaction two or more years after marriage is lowered and eliminates the lasting effect of the formation of a union itself. The omission of such time-variant covariates that have been shown to influence life satisfaction can therefore lead to erroneous conclusions about the effect of forming a union.[7]

Although our model owes much to that of Lucas and colleagues in its baseline-reaction-adaptation conception, there are important differences in our findings. Most importantly, we find that individuals who remain married two or more years do not revert to their baseline value before marriage. On the contrary, we find life satisfaction of those who are married to be significantly higher than their baseline value, at a level corresponding to that found for cohabitation preceding marriage. The difference between our results and those of Lucas and colleagues does not arise from our larger sample. If we run our model on their sample, the same difference is found as reported here. The difference arises from their failure to treat age as varying with time, and thus to control for life circumstances that affect life satisfaction negatively. This peculiar treatment of age occurs again in a recent defense of their conclusion that adaptation to marriage is rapid and complete (Lucas and Clark 2006).

We also differ from Lucas and colleagues in our baseline value for the first marriage sample. They find that baseline life satisfaction of those who marry is significantly greater than for the German Socio-Economic Panel population generally, and they posit a selection into marriage of individuals with personality characteristics that attract

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[7]Lucas and Clark (2006) note that happiness levels decline somewhat from ages 18 to 29 in the German Socio-Economic Panel and other national samples. To account for this effect, which might be caused by life circumstances that are highly correlated with age (e.g., declines in health), it is necessary to include age as a level-1 variable in the hierarchical linear modeling analysis (within-subject). The inclusion of age as a level-2 moderator (between-subjects) would only account for the effect of an individual's time-invariant age (e.g., mean age or age at marriage) on the slopes (see Raudenbush and Bryk 2002 for an explanation of time-variant vs. time-invariant covariates).

marriage partners. Our results, however, indicate that the marriage sample is selected on socioeconomic characteristics and that these characteristics suffice to explain the higher baseline value of life satisfaction. Once these characteristics are controlled for, there is no room for a personality-based explanation of the baseline life satisfaction of the marriage sample. But our results do suggest that individuals who eventually divorce, a group not included in the analysis by Lucas and colleagues, may be selected on personality characteristics that predispose this group to significantly lower baseline satisfaction than those whose marriages remain intact. Our results agree with Lucas et al.'s 2003 study in two substantive respects. We, too, find a "honeymoon period" effect – a significant increase in life satisfaction around the time of marriage. We both also find that life satisfaction drops two years after marriage. But whereas they report that it falls to the premarriage baseline level – to the setpoint value – we find it remains significantly above the baseline and at the same value as that found for cohabitation.

Discussion

Our study of data from the German Socio-Economic Panel covering the years 1984-2004 supports the conclusions of previous cross-sectional studies on the effects of cohabitation, marriage, and divorce on life satisfaction. We find that the formation of unions has a significant positive effect on life satisfaction, while the dissolution of unions through separation or divorce has a significant negative effect. These results are consistent with the "social support" interpretation commonly offered for the association between marriage and life satisfaction. We find no evidence that children affect life satisfaction, either for those who remain married or for those who divorce. In the year of marriage and the following year, we see a significant additional boost in life satisfaction, a "honeymoon period" effect. Although the life satisfaction of individuals in intact marriages drops two or more years after marriage, presumably reflecting habituation, it remains significantly higher than it was before marriage. The contrary conclusion of the study

by Lucas and colleagues (2003) – that life satisfaction two or more years after marriage reverts to its level two or more years before marriage – arises from their failure to control for other life circumstances that negatively affect life satisfaction. Our findings thus run counter to the setpoint model of psychology, whereby rapid adaptation to life transitions and events is pervasive and happiness centers around a setpoint determined by genetics and personality. Instead, we find that the formation of unions has an enduring positive effect on life satisfaction.

We find no significant difference between life satisfaction two or more years after marriage and life satisfaction in cohabiting unions prior to marriage. Although we cannot identify the partners in cohabiting unions, they are mostly the same ones as in subsequent marital unions, because almost 70 percent of individuals in first marriages were cohabiting in the year preceding marriage. The similarity in the life satisfaction estimates before and after marriage of those in unions suggests that the formalization of unions by marriage has no significant impact on life satisfaction. What is important is finding the right partner, not the nature of the union itself. This inference must be qualified, however, by recognition that we do not know what course life satisfaction would have followed had the partners in the unions we studied not married.

We find also, and not surprisingly, that compared with the German panel population generally, the marriage sample is selective with regard to a number of socioeconomic characteristics: they are younger, better educated, healthier, more likely to be employed, and more religious. Once allowance is made for these characteristics, we find no evidence that persons who marry also have personality traits that would make them more attractive as marriage partners. There is evidence, however, that those whose marriages break up do have personality traits different from the overall population that might adversely affect the likelihood of an enduring union. Moreover, this "divorce subgroup" is also distinctive in its lower socioeconomic status. We do not find a marriage trajectory for this divorce subgroup – cohabitation-marriage reaction-marriage adaptation – any different from that of individuals in first marriages that remain intact. The

implication we draw is that the roots of prospective dissolution lie in the distinctive socioeconomic and personality traits of those destined for separation and divorce, and not in a disparate course of life satisfaction in the first years of marriage.

Tables

Table 1: Characteristics of the German Socio-Economic Panel (GSOEP 1984-2004) population and first marriage samples[a]

Line	Sample size or variable	GSOEP population	First marriage sample	Divorce subgroup
1	Number of persons[b]	37,244	1,582	151
2	Mean age, years	42.8	29.0	30.1
3	Education greater than high school, percent	19.0	27.1	21.2
4	Employed, percent[b]	68.7	98.5	98.0
5	Mean health (1 = low, to 5)[c]	3.47	3.77	3.67
6	Religiosity, percent	33.7	49.6	45.7
7	Household income in €1995	29,729	29,195	25,619
8	Male, percent	49.0	50.3	43.7
9	Children in t_{+2}	–	0.82	0.85

NOTE: – = not applicable.

a. See Appendix A for description of variables.

b. Percentage of respondents who were employed at least once during the sample period.

c. Sample size is smaller than in line 1.

Figures

Figure 1: Added life satisfaction before and after marriage for persons in first marriages

*significant at 0.001 level or better.

NOTE: The slope coefficients are usually added to the coefficient of the intercept. The value for the intercept (baseline) is not statistically different from 0 here. The figure thus does not show slope coefficients that are added to 0.102 (baseline), but added to 0.

Appendix A: Description of variables

Satisfaction:
In conclusion, we would like to ask you about your satisfaction with your life in general. Please answer according to the following scale: "0" means completely dissatisfied, "10" means completely satisfied.
How satisfied are you with your life all things considered?

Marital status:
What is your marital status?

- *Married, living together with spouse*

- *Married, living (permanently) separated from my spouse*

- *Single*

- *Divorced*

- *Widowed*

- *Spouse living in different country* (This marital status category is only asked of foreigners and in a different section of the survey, but it is included in the marital status variable generated by the German Institute for Economic Research (DIW).)

Cohabitation:

1984: question missing (but cohabitation can be derived from retrospective question in 1985 survey)

1985:

- *Has your family situation changed since the beginning of* [the year that was 2 years before the current survey]? *Please answer whether any of the following applies to you, and if so, when*
  - moved in with partner

If answer to (a) is yes, cohab. = 1; otherwise = 0.

1986-1990:

- *Are you living with someone in a long-term relationship?*
- (if yes) *since when have you lived together?*
- (or) *live in separate apartments since*
- *Has your family situation changed since the beginning of* [the year that was 2 years before the current survey]? *Please answer whether any of the following applies to you, and if so, when*
  - moved in with partner

If answer to (a) or (d) is yes, cohab. = 1; otherwise = 0.

1991-1997:

- *Are you living with someone in a long-term relationship?*
- (if yes) *Does your partner live in your household?*

- *Has your family situation changed since the beginning of* [the year that was 2 years before the current survey]? *Please answer whether any of the following applies to you, and if so, when*
  - *moved in with partner*

If answer to (b) or (c) is yes, cohab. = 1; otherwise = 0.

1998-2004:

- *Are you in a serious/permanent relationship?*

- (if yes) *Does your partner live in the same household?*

- *Has your family situation changed after December 31,* [year that was 2 years before the current survey]? *Please indicate if any of the following apply to you and if so, when this change occurred.*
  - I moved in with my partner (if the respondent marks "yes", he/she also indicates whether this event took place in the year of the survey or the year preceding the survey.)

If answer to (b) or (c) is yes, cohab. = 1; otherwise = 0.

Employed:
Are you currently engaged in paid employment? Which of the following applies best to your status?

- [1] Full-time employment
- [2] Regular part-time employment
- [3] Vocational training
- [4] Marginal part-time employment
- [5] Maternity leave (not available 1984-1990, 1999-2004)
- [6] Military, community service
- [7] Not employed
- [8] Unemployed (only available in 1984)
- [9] Disabled employment (only available in 1998-2003)
- [10] Near retirement, zero working hours (only 2002-2004)

Creation of a dummy variable "employed": "Employed" has a value of one in a given survey year if [1] Full-time employment, [2] Regular part-time employment, [3] Vocational training [6] Military, community service, or [9] Disabled employed.

Religiosity:
Religiosity is measured by church attendance and the importance of religion.
Church attendance:
1 = daily, 2 = weekly, 3 = monthly, 4 = less frequently, 5 = never
Importance of Religion:
1 = very important, 2 = important, 3 = less important, 4 = very unimportant
Religiosity = 1 if church attendance = 1 or 2 or importance of religion = 1 or 2 at some point during the years surveyed; otherwise religiosity = 0.

Health status: (available 1992, 1994-2003)
How would you describe your current health?
Very good (5), Good (4), Satisfactory (3), Poor (2), Bad (1) [original coding reversed]

Education more than highschool:
Generated CNEF (cross-national equivalent file) variable.[8]
Education with respect to high school. Less than high school (1), completed high school (2), more than high school (3). The level of education might change during the survey period, but the analysis takes into account the highest level of education reported during the survey period.

Children
Generated CNEF (cross-national equivalent file) variable.[8]
Number of children in household (under age 18).
The analysis only considers children that are in the household in the year of marriage and after (to avoid counting siblings or other relatives as children).

Income
Generated CNEF (cross-national equivalent file) variable.[8]
Household post-tax income.
Originally measured in current year Euros and then converted to 1995 Euros.

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[8]Constructed variables are not directly available in the original surveys and derived from several questions in the survey.

1 Appendix B: The Model

The multilevel model used in this article is as follows:

Level 1: (within-subject)

$$
\begin{aligned}
(\text{Life satisfaction})_{it} = \; & \beta_{0i} + \beta_{1i}(\text{cohabitation})_{it} + \beta_{2i}(\text{reaction})_{it} + \beta_{3i}(\text{adaptation})_{it} \\
& + \beta_{4i}(\text{divorced})_{it} + \beta_{5i}(\text{employed})_{it} + \beta_{6i}(\text{age})_{it} + \beta_{7i}(\text{income})_{it} + r_{it}
\end{aligned}
$$

Level 2: (between-subjects)

$$
\begin{aligned}
\beta_{0i} &= \gamma_{00} + \gamma_{01}(\text{divorce group})_i + \gamma_{02}(\text{male})_i + \gamma_{03}(\text{education})_i + \gamma_{04}(\text{religiosity})_i + u_{0i} \\
\beta_{1i} &= \gamma_{10} + \gamma_{11}(\text{divorce group})_i + u_{1i} \\
\beta_{2i} &= \gamma_{20} + \gamma_{21}(\text{divorce group})_i + u_{2i} \\
\beta_{3i} &= \gamma_{30} + \gamma_{31}(\text{divorce group})_i + u_{3i} \\
\beta_{4i} &= \gamma_{40} + \gamma_{41}(\text{education})_i + u_{4i} \\
\beta_{5i} &= \gamma_{50} + \gamma_{51}(\text{divorce group})_i + \gamma_{52}(\text{male})_i + \gamma_{53}(\text{education})_i \\
\beta_{6i} &= \gamma_{60} + \gamma_{61}(\text{divorce group})_i \\
\beta_{7i} &= \gamma_{70} + \gamma_{71}(\text{divorce group})_i
\end{aligned}
$$

The intercept, cohabitation, reaction, adaptation and divorced variables are entered as random variables. The variables "employed," "age," and "income" are included as level-1 variables because they vary over time. Age and income are grandmean centered so that the intercept value reflects the life satisfaction of a person of mean age with mean income in the marriage sample. Employed is uncentered because it is a dummy variable. "Religiosity" is a time-invariant covariate and is therefore included in the level-2 equation. It is also a dummy variable and therefore uncentered. Religiosity has a significant effect on the intercept, but not on the remaining slopes. We therefore only included religiosity in the estimation of the intercept. The results concerning adaptation do not change if religiosity is included in the estimation of the remaining slopes. Similarly, the time-invariant covariates measuring gender (male) and education have a significant impact on the intercept and the slope for employment, and education also has an impact on the divorce period slope. We also include a level-2 variable which indicates whether an individual belongs to the subgroup of people who divorce during the sample period (divorce group). This dummy variable allows us to assess whether people who are heading for divorce or separation react differently to marriage. This divorce group variable is not included in the measurement of the slope for the divorce period because this period is only measured for people who are divorced. The software used is HLM 6 (Raudenbush, Bryk, and Congdon 2000).

Appendix C

Model term	Coefficient	Standard error	t-ratio	p-value
Intercept β_{0i}				
intercept γ_{00}	0.102	0.063	1.612	0.107
divorce group γ_{01}	-0.480	0.176	-2.724	0.007
male γ_{02}	-0.339	0.077	-4.379	0.000
education γ_{03}	0.318	0.058	5.512	0.000
religiosity γ_{04}	0.187	0.048	3.891	0.000
Cohabitation β_{1i}				
intercept γ_{10}	0.183	0.040	4.627	0.000
divorce group γ_{11}	-0.031	0.140	-0.219	0.827
Marriage reaction period β_{2i}[a]				
intercept γ_{20}	0.369	0.043	8.651	0.000
divorce group γ_{21}	0.050	0.141	0.358	0.720
Marriage adaptation period β_{3i}[b]				
intercept γ_{30}	0.173	0.051	3.382	0.001
divorce group γ_{31}	-0.095	0.169	-0.566	0.571
Divorce period β_{4i}[b]				
intercept γ_{40}	-0.286	0.205	-1.395	0.163
education group γ_{41}	0.422	0.163	2.595	0.010
Time-variant covariates				
Employed β_{5i}				
intercept γ_{50}	0.077	0.039	1.942	0.052
divorce group γ_{51}	0.234	0.110	2.130	0.033
male γ_{52}	0.333	0.071	4.692	0.000
education γ_{53}	-0.179	0.053	-3.416	0.001
Age β_{6i}				
intercept γ_{60}	-0.017	0.004	-4.300	0.000
divorce group γ_{61}	0.004	0.012	0.311	0.756
Household income β_{7i}				
intercept γ_{70}	4×10^{-6}	1×10^{-6}	4.481	0.000
divorce group γ_{71}	3×10^{-6}	4×10^{-6}	0.718	0.473
n	1,568			

a. Year of marriage and following year.
b. Second year after marriage and thereafter.

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