published in:

The Journal of Socio-Economics 35 (2), 2006, pp. 326-347

Working Paper No. 143

**Does Marriage Make People Happy,
Or Do Happy People Get Married**

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January 2003

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September 15, 2004
(revised version)

Abstract: This paper analyzes the causal relationships between marriage and subjective well-being in a longitudinal data set spanning 17 years. We find evidence that happier singles opt more likely for marriage and that there are large differences in the benefits from marriage between couples. Potential, as well as actual, division of labor seems to contribute to spouses' well-being, especially for women and when there is a young family to raise. In contrast, large differences in the partners' educational level have a negative effect on experienced life satisfaction.

Does Marriage Make People Happy, Or Do Happy People Get Married?

1   Introduction

Marriage is one of the most important institutions affecting people's life and well-being. Marital institutions regulate sexual relations and encourage commitment between spouses. This commitment has positive effects, for instance on spouses' health and their earnings on the labor market.

In this paper, we directly look at the effect of marriage on spouses' happiness as measured in an extensive panel survey, the German Socio-Economic Panel, with data on reported subjective well-being. This allows us to analyze whether marriage makes people happy, or whether happy people are more likely to get married. We want to go beyond the numerous previous studies that document that married people are happier than singles and those living in cohabitation (e.g. Myers 1999). We have two main interests in this paper: One goal is to provide systematic evidence on who benefits more and who benefits less from marriage. This evidence helps in assessing the crucial auxiliary assumption in models of the marriage market. Becker's seminal work on the economics of marriage (1973, 1974)[1] is based on the gains married people get from household production and labor division. Other theories focus on spouses' joint consumption of household public goods or on reciprocity and social equality in homogamous[2] relationships. In the latter case, it is argued that the tendency for "like to marry like" facilitates compatibility of spouses' basic values and beliefs. Our empirical analysis studies whether couples with different degrees of potential and actual specialization of labor and more or less difference in education systematically differ in their benefits from marriage.

It is not our intent to recommend whether people should or should not marry. Rather, we intend to contribute to the public discussion about the value of intact marriages and legislators' debates about marriage penalties in tax codes, or the effect of welfare programs and social security on marriage. Moreover, empirical evidence on different couples' utility levels helps us to better

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[1] An earlier economic theory of marriage in the spirit of Becker was written by Knut Wicksell (1861-1926) (see Persson and Jonung 1997). The progress in the theoretical analysis of marriage in economics is surveyed, e.g. in Weiss (1997) and Brien and Sheran (2003).

[2] Homogamy describes the tendency for "like to marry like". People of similar age, race, religion, nationality, education, attitudes and numerous other traits tend to marry one another to a greater degree than would be found by chance (see e.g. Hughes et al. 1999).

understand the sources of well-being in marriage. The empirical analysis is challenged by the question of causality. Does marriage make people happier or is marriage just more likely for happier people? The second goal of our analysis is to address the question of selection. So far, there is no large-scale evidence on the role of selection in the relation between marriage and happiness. In a longitudinal data set, we compare singles who remain single with singles who marry later as well as with people who are already married.

In a panel spanning a period of 17 years, we find that selection of happier people into marriage is pronounced for those who marry when they are young and again becomes an important factor for those who marry later in life. Moreover, a retrospective evaluation shows that those who get divorced were already less happy when they were newly married and when they were still single. This indicates substantial selection effects of generally less happy individuals into the group of divorced people.

In order to study the differences in benefits from marriage, we restrict our analysis to people who got married during the 17 years of the sampling period. The results show that there are large differences in the benefits of marriage between couples. Moreover, most of the extra benefits in reported well-being are experienced during the first few years of marriage. Potential, as well as actual, division of labor seems to contribute to spouses' well-being, especially for women and when there is a young family to raise. In contrast, above median differences in partners' education level has a negative effect on experienced life satisfaction compared to those couples with small differences.

The paper proceeds as follows. Section 2 gives a brief introduction to previous research on marriage and well-being and outlines the research questions. The empirical analysis is conducted in section 3. The first subsection presents the panel data for the analysis and introduces the empirical approach. The second subsection deals with the question of selection into marriage. In subsection 3.3, the differences in the benefits of marriage are studied. Section 4 offers concluding remarks.

2   The effects of marriage on spouses' well-being

With marriage, people engage in a long-term relationship with a strong commitment to a mutually rewarding exchange. Spouses expect some benefits from the partner's expressed love, gratitude and recognition as well as from security and material rewards. This is summarized in the protection perspective of marriage. From the protective effects, economists have, in particular, studied the financial benefits of marriage. Marriage provides basic insurance against adverse life

events and allows gains from economies of scale and specialization within the family (Becker 1981). With specialization, one of the spouses has advantageous conditions for human capital accumulation in tasks demanded on the labor market. It is reflected in married people earning higher incomes than single people, taking other factors into consideration and explicitly dealing with the possibility of reverse causation (Chun and Lee 2001, Korenman and Neumark 1991 and Loh 1996). According to this latter view, the marriage income premium would be solely due to men with a higher earnings potential being more likely to find a partner and get married (Nakosteen and Zimmer 1987).

There is a wide range of benefits from marriage that go beyond increased earnings. These benefits have been studied in psychology, sociology and epidemiology. Researchers in these fields have documented that, compared to single people, married people have better physical and psychological health (e.g. less substance abuse and less depression) and that they live longer. The evidence on the effects on health has been reviewed e.g. in Burman and Margolin (1992) and Ross et al. (1990). Waite and Gallagher (2000) additionally survey evidence on income, health, mortality, children's achievements and sexual satisfaction. A survey that is focused on longitudinal evidence is Wilson and Oswald (2002).

Recently, there has been an increasing interest in the effect of marriage on people's happiness. It has been found that marriage goes hand in hand with higher happiness levels in a large number of studies for different countries and time periods (e.g. Diener et al. 2000, Stack and Eshleman 1998, see also Coombs 1991 and Myers 1999 for surveys). Married persons report greater subjective well-being than persons who have never been married or have been divorced, separated or widowed. Married women are happier than unmarried women, and married men are happier than unmarried men. Married women and married men report similar levels of subjective well-being, which means that marriage does not benefit one gender more than the other.

In this research, two reasons why marriage contributes to well-being are emphasized (Argyle 1999): First, marriage provides additional sources of self-esteem, for instance by providing an escape from stress in other parts of one's life, in particular one's job. It is advantageous for one's personal identity to have more than one leg to stand on. Second, married people have a better chance of benefiting from a lasting and supportive intimate relationship, and suffer less from loneliness.

Among the not married, persons who cohabit with a partner are significantly happier than those who live alone. But this effect is dependent on the culture one lives in. It turns out that people

living together in individualistic societies report higher life satisfaction than single, and sometimes even married, persons. The opposite holds for collectivist societies.

The difference in happiness between married people and people who were never married has fallen in recent years. The "happiness gap" has decreased both because those who have never married have experienced increasing happiness, and those married have experienced decreasing happiness (Lee et al. 1991). This finding is consistent with people marrying later, divorcing more often and marrying less, and with the increasing number of partners not marrying, even where there are children.

In economics, the effects of marriage on happiness have been found e.g. for the United States and the countries of the European Union (Di Tella et al. 2001), for Switzerland (Frey and Stutzer 2002a) and for Latin America and Russia (Graham and Pettinato 2002). Based on a microeconometric happiness function, the effect on subjective well-being of marriage has even been translated into a monetary equivalent. Blanchflower and Oswald (2004) calculate that a lasting marriage is, on average, worth $100,000 per year (compared to being widowed or separated).

However, does marriage create happiness or does happiness promote marriage? A selection effect is likely.[3] It seems reasonable that dissatisfied and introvert people find it more difficult to find a partner. It is more fun to be with extravert, trusting and compassionate persons (for a discussion of different mechanisms driving selection, see Veenhoven 1989). Cross-section research cannot properly deal with this selection explanation. Instead, panel data need to be analyzed. Most previous studies are limited by small sample sizes and short measurement periods (e.g. Menaghan and Lieberman 1986). An exception is the panel study by Lucas et al. (2002) over the course of 15 years. However, the focus of their analysis is on adaptation. Selection effects are only roughly studied in comparing those people who will get married to the average respondent. Differences in observable characteristics are not controlled for and age structure is not taken into consideration.

Our analysis uses 17 waves of the German Socio-Economic Panel. To our knowledge, this is the first large-scale evidence on marriage and selection with data on reported satisfaction with life.

What characterizes the couples who gain the most from marriage? This question sheds light on the channels providing the benefits from marriage. Moreover, related evidence helps to assess the crucial auxiliary assumptions in models of the marriage market.[4] Economists have focused on the

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[3] Selection effects into marriage are studied e.g. by Mastekaasa (1992).

[4] Pollak (2002) discusses the important role of auxiliary assumptions in family and household economics.

gains from specialization in household production, while sociologists and psychologists have emphasized increased emotional support and relational gratification. The latter is often related to homogamous couples, for instance with regard to social status measured in spouses' level of education. It is hypothesized that couples with largely different education levels gain fewer benefits from marriage and report lower subjective well-being. Previous research has focused on marital satisfaction rather than general satisfaction and found some supporting evidence for the benefits of homogamy (e.g. Tynes 1990, Weisfeld et al. 1992).

3   Empirical analysis

3.1   Data and empirical approach

In economics, the welfare effects of marriage have so far mainly been studied in terms of its effects on income. Here we use a much broader concept of individual well-being. We directly study spouses' level of utility and use reported subjective well-being as a proxy measure.[5] Although this is not (yet) standard in economics, indicators of happiness or subjective well-being are increasingly studied and successfully applied (e.g. Clark and Oswald 1994, Di Tella et al. 2001, Easterlin 2001, Frey and Stutzer 2000, Kahneman et al. 1997, and for surveys see Frey and Stutzer 2002a,b and Oswald 1997). The existing state of research suggests that measures of reported satisfaction are a satisfactory empirical approximation to individual utility (Frey and Stutzer 2002b).

The current study is based on data on subjective well-being from the German Socio-Economic Panel Study (GSOEP).[6] The GSOEP is one of the most valuable data sets to study individual well-being over time. It was started in 1984 as a longitudinal survey of private households and persons in the Federal Republic of Germany and was extended to residents in the former German Democratic Republic in 1990. We use all the samples available in the scientific use file (samples A to F) over the period 1984 to 2000. This provides observations for some people over 17 subsequent years. People in the survey are asked a wide range of questions with regard to their

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[5] Subjective well-being is the scientific term in psychology for an individual's evaluation of his or her experienced positive and negative affect, happiness or satisfaction with life. With the help of a single question or several questions on global self-reports, it is possible to get indications of individuals' evaluation of their life satisfaction or happiness (Diener et al. 1999, Kahneman et al. 1999). Behind the score indicated by a person lies a cognitive assessment to what extent their overall quality of life is judged in a favorable way (Veenhoven 1993). For a discussion on how judgments on individual well-being are formed, see Schwarz and Strack (1999).

[6] For a related analysis on motherhood, labor force status and life satisfaction based on GSOEP, see Trzcinski and Holst (2003).

socio-economic status and their demographic characteristics. Moreover, they report their subjective well-being based on the question "How satisfied are you with your life, all things considered?" Responses range on a scale from 0 "completely dissatisfied" to 10 "completely satisfied". In order to study the effect of marriage on happiness, we restrict the sample for the selection analysis to those who are single or married, and for the second analysis to those who marry during the sampling period (see Appendix for a detailed description of the sampling procedures).

The first estimation in Table 1 presents a simple microeconometric happiness function based on a sample of 133,952 observations from 15,268 different people. The first estimation replicates the findings from previous studies and shows a positive effect of being married on reported satisfaction with life compared to those living as singles. Singles with a partner have a happiness level somewhere in between, while people who are married but separated experience lower subjective well-being than those who live as couples.

[Table 1 about here]

The size of the coefficient can be directly interpreted. On average, married people report a 0.30 point higher life satisfaction than singles ceteris paribus. This is a sizeable effect. For example, it is equal to the effect of people having 2.5 times the mean household income (rather than the mean household income). Compared to the life satisfaction differential between employed and unemployed people (=1.01, not explicitly shown in Table 1), being married is about three tenth as good for life satisfaction as having a job. In the pooled estimation, cohabitating partners are 0.20 point more satisfied with life than singles without a partner. This is two thirds of the effect of marriage. The difference in the two effects is statistically significant.

The partial correlations are estimated with a large number of other factors kept constant. For a discussion of the socio-demographic and socio-economic correlates of life satisfaction in the GSOEP, see Stutzer and Frey (2004). Table 1 only shows the variables that are closely related to our research question. Women in the sample are slightly more satisfied than men. People with more years of education report higher happiness scores. Reported life satisfaction is also related to the position in the household. Being a child of the head of the household rather than the actual head of the household (or their spouse) means, on average, higher well-being, while the effect is

negative for household members who are not children of the head of the household.[7] However, according to the pooled regression both groups profit more from higher household income than the head of the household or their spouse. These latter interaction terms are included in order to take into consideration that household income before and after marriage may capture rather different resources.[8] Household income after marriage is supposed to be almost entirely controlled by the respondent and also earned to a large extent by the two spouses. Income equivalence is constructed by a variable for the number of household members. Further control variables capture age (seven variables), employment status (eight variables), place of residence (Old or New German Laender) and nationality (two variables). In order to control for underlying time patterns, dummy variables for the last 16 waves are included.

In the first regression in table 1, ordinary least squares (OLS) estimations are reported. Thus, it is implicitly assumed that the answers on the ordinal scale can be cardinally interpreted. While the ranking information in reported subjective well-being would require ordered probit or logit regressions, a comparative analysis shows that it makes virtually no difference whether responses are treated ordinally or cardinally in a microeconometric happiness function. In the second regression, results of an ordered logit estimation are presented. Coefficients are directly comparable in their relative size with the estimated partial correlation in the OLS estimations. For example, the ratio between the partial correlation of marriage and education is 1:1.02 in the OLS model, while it is 1:1.09 in the ordered logit model. The eleven categories of the dependent variable indeed seem to mitigate potential problems from assuming continuity.[9]

The variables discussed above provide the set of control variables that are applied throughout the paper. However, it is not enough to control for possibly correlated variables in order to estimate the effect of marriage on subjective well-being. It has been shown that particular personality traits, e.g. extraversion, go with systematically higher happiness ratings (DeNeve and Cooper 1998). It is very likely that the same people also have a higher probability of getting married or staying married. Thus, selection effects are expected to bias the results for marriage and other variables in simple pooled regressions. A first step in order to get more reliable estimates is to take advantage of the fact that the same people are re-surveyed over time. A panel allows for

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[7] Both effects are estimated for average household income.

[8] Annual household income is in thousands of 1999 German Marks and adjusted for differences in purchasing power between Western and Eastern Germany.

[9] Given that we find very similar results when applying the OLS technique rather than some more sophisticated technique, and that the OLS results are easy to interpret and easier to handle in the analyses of life satisfaction profiles around marriage, we prefer to use the OLS in the remainder of our study.

estimating the effect of a change in the marital status for one and the same person. These within-the-individual effects are independent of time-invariant personality factors and can be averaged across individuals. Technically, the estimator takes a time-invariant base level of happiness for each individual into account (fixed effect).[10] The corresponding results are presented in the fourth column of Table 1. The positive and sizeable effect of being married rather than single remains. Thus, the positive correlation in the baseline estimation cannot simply be explained by a selection of happier people into marriage. Compared to the effect of becoming unemployed or finding a job (=0.67, not explicitly shown in Table 1), the effect of marriage is even relatively bigger in the fixed-effects specification than in the pooled estimation.

The last estimation in Table 1 studies the marriage effect with the most flexible specification. Using a conditional (fixed-effects) logistic estimator, both the ordinality of the dependent variable, as well as the possibility of individual specific anchors are taken into account. For this estimation, the dependent variable is set equal to one if reported life satisfaction is higher than seven and zero otherwise. The estimate shows again a positive correlation between being married and reported life satisfaction.

Table 2 studies the sensitivity of the results with regard to sample selection and the choice of control variables. The previous results for marriage are based on respondents being the head of household or their spouse, as well as respondents (mainly singles) being in some sort dependent from the head of household. Controlling for this latter factor with separate variables in the estimation equation might not be enough. In Table 2, the sample is therefore restricted to people being the heads of households or their spouses. In the reduced sample, a coefficient for marriage is estimated that is equal to the one in the pooled estimation in Table 1.

[Table 2 about here]

The remaining specifications in Table 2 are, in addition, restricted to people younger than 45. This allows a more precise testing for the presence of children. From the number of children in the household, it is difficult to derive the parental status of the respondent. Accordingly the following coding is applied: If a respondent is the head of household or her or his spouse and if she or he is

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[10] Theoretically, we would want to know the counterfactual level of life satisfaction of any married individual in the survey. Based on actually reported subjective well-being, we could, however, at best build a comparison group

living in a household with children, a dummy variable for having children is set equal to one. With the sample restricted to the heads of household, their spouses and to people younger than 45, the parental status can not only be effectively controlled with the variable "children" (second specification) but the number of children can be included with separate dummy variables in the estimation equation (third and fourth specification). While the effective control of the presence of children does not change the estimated effect of marriage, the partial correlations for children are interesting in themselves. In the pooled estimation, there is a small but positive correlation between life satisfaction and having up to three children. In contrast, the fixed effect specification finds small but negative partial correlations for having one child or more.

Individual fixed effects in a multiple regression are one way of studying selection and marriage. This approach is effective when well-being patterns around marriage resemble a single shift at the time of marriage. However, if there are additional systematic patterns around marriage, the identification of well-being gains may be difficult to assess with this approach. In fact, on average, happiness peaks around the time of marriage. People report increasing average satisfaction scores before marriage and decreasing ones after marriage. With this pattern, it is unclear which observations produce the size of the effect in the regression and how it can be interpreted. A partial remedy might be the exclusion of observations around the year of marriage. In a simple test, we exclude 10,016 observations capturing life satisfaction during the three years before and after marriage (in total six years) of people who got married during the sampling period. Reflecting an astonishing robustness of the marriage effect, we find again a correlation coefficient of 0.31 in both the pooled and the fixed-effects estimations (see detailed results in Table A.2 in the appendix). While these latter results indicate that there might be less of an estimation problem in the case at hand than theoretically expected, we prefer a complementary approach to provide information about the protection and selection hypotheses of marriage.

In section 3.2, a visual test is conducted to study selection. The subjective well-being of three groups of people is compared over their life cycle. People who will marry are studied in comparison to those who will never marry and those who are already married. This allows us to make interpersonal comparisons to study selection. Moreover, it allows us to study changes in the extent of selection for different age groups.

A visual approach is also applied in section 3.3 in order to study the benefits from marriage for different groups of couples with regard to their socio-demographic characteristics. Happiness

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consisting of people who wanted to marry but for some reason of bad luck stayed single (being sure that this "bad luck" does not affect singles' life satisfaction directly).

patterns are studied around the time of marriage in order to detect systematic differences in reported subjective well-being.

3.2   Self-selection or do happy people get married?

Is marriage an institution for the happy and joyful crowd that finds a partner? This question summarizes the selection hypothesis in research on marriage and well-being. It proposes that those who get married are intrinsically happier people.

In order to test the selection hypothesis, we follow a simple approach and compare two different groups of singles. The level of subjective well-being of singles who marry later in life is contrasted with the well-being of those who stay single, controlling for numerous observable characteristics. For any given age, a comparison of the average life satisfaction in these two groups indicates systematic heterogeneity to some extent. However, it has to be taken into consideration that the years immediately before marriage might not be representative for a person's intrinsic happiness level. People might live in a marriage-like relation, as cohabitants, thinking and planning their joint future in a loving relationship. As these years end in marriage, they are more likely to be the best years in life. Therefore, we only study singles who are 4 or more years away from marriage. Those expected to stay single represent the comparison group. This criterion has to be made tractable in a panel spanning only 17 years. In particular, because observations for young age groups are wanted. The category "remained single" is therefore defined as those who are not married while in the sample, and can be observed at least until the age of 35. People in the sample marry, on average, at the age of 27 (std. dev. 5.9).

Figure 1 shows the result of the analysis for German data between 1984 and 2000. The reported average satisfaction scores are calculated, taking respondents' age, education level, parenthood, household income, household size, relation to the head of the household, labor market status, place of residence and citizenship status into account.

[Figure 1 about here]

The graph reads as follows: 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. The difference between the two dummy variables for age 20/21 is 0.31 (std. err. 0.16) satisfaction scores. If the singles who have not married before the age of 30 report their

subjective well-being, those who will marry report, on average, roughly equal satisfaction scores to those who will not marry. Above the age of 30, singles who will marry in the future are on average reporting higher satisfaction scores than those who stay single, with an increasing gap. These differences (marked as shaded areas) are indicating the degree of selection in the relationship between marriage and happiness. Around age 20, the selection of people who will marry in the future includes a lot of singles whose happiness level is above average. Around the age of 30, the group of people who will marry in the future cannot be distinguished from the ones staying single. This is interesting, as one might expect an increasing gap between the happiness level of the two groups: among those who are still single at a higher age, it is mainly the happiest who are expected to marry. This correlation is in fact visible above age 30. Overall, the selection patterns indicate that selection effects are the largest for those who marry at a young age and those who marry late in life.[11]

While the extent of selection can be studied by this interpersonal approach, the extent of well-being derived from marriage can only tentatively be assessed. Comparing singles who will marry one day with those people who are already married is a comparison after a possible selection has taken place. However, the gap between those two groups is substantial and unlikely to be due to time patterns in selection, i.e. due to the larger selection effects for those marrying at a young age. It has to be noted that average life satisfaction for those married does not include the first three years of marriage. Otherwise, the difference would be larger and substantially driven by the high but decreasing satisfaction scores in the post honeymoon stage.

The graph in Figure 1, moreover, seems to indicate that the difference in reported subjective well-being between singles and married people diminishes with age. However, attrition is likely to be more of a problem for unhappy singles than unhappy spouses, who are members of an interviewed household.

3.3 Differences in happiness of married people

Marriage is expected to be advantageous to people for several reasons. Economists emphasize the division of labor and specialization between married people, while sociologists in particular focus on homogamy, i.e. that "like marry like" in order to have a larger consensus over preferences.

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[11] We can only speculate about the drop in the difference in life satisfaction. Around the age of 30, there might be many people in the group of prospective married people who would like to marry but do not have a partner or a partnership to fulfill their goal. Whereas when the singles who will marry in the future get older, they seem to become a more and more cheerful selection of the single population.

In this section, it is tested whether there is evidence for some of these claims in data on reported satisfaction with life. We study people who marry within the sample period and observe their well-being around marriage. Figure 2 shows average life satisfaction in the years before and after marriage, based on 21,809 observations for 1,991 people. Average scores are calculated after taking respondents' sex, age, education level, parenthood, household income, household size, relation to the head of the household, labor market status, place of residence and citizenship status into account.

[Figure 2 about here]

The graph in Figure 2 shows a noticeable pattern: As the year of marriage approaches, people report, on average, higher satisfaction scores. In contrast, after marriage, the average reported satisfaction with life decreases.

Several concepts may explain this pattern. Some psychologists put forward an event explanation that marital transitions cause short-term changes in subjective well-being (e.g. Johnson and Wu 2002). Others take it as evidence for adaptation (Lucas et al. 2002). Adaptation in the marriage context means that people get used to the pleasant (and unpleasant) stimuli they get from living with a partner in a close relationship, and after some time experience more or less their baseline level of subjective well-being. Whether this adaptation is truly hedonic, or whether married people start using a different scaling for what they consider a satisfying life (satisfaction treadmill), is difficult to assess.[12] There is again a selection explanation for the pattern. Most people only get married if they expect to experience a rewarding relationship in the future. They predict their future well-being as spouses based on their current well-being. Therefore, the last year before marriage becomes the last year, because the couples experience a particularly happy time in their relationship.

A similar selection can be observed for persons out of marriage. Figure 3 shows separate well-being patterns around marriage for those who stay married and those who get divorced within the sample period. It is clearly visible that those who are less satisfied before marriage also report

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[12] Previous interpretations of the pattern in the framework of the set point model (e.g. Lucas et al. 2003) take average life satisfaction at the beginning of the sampling period as a baseline. Given the strong pattern in the age-life satisfaction profile, conclusions about full adaptation or that there is no marriage effect, however, are difficult to draw.

lower satisfaction scores after marriage, and in this setting finally terminate the marriage relationship.

[Figure 3 about here]

In the current study, we are less interested in these patterns as such than in the large differences in life satisfaction for the newly married. In the first year after marriage, the standard deviation of reported satisfaction with life is 1.60 around the mean of 7.64. In the second year, the standard deviation is 1.59 and the mean 7.43. These numbers indicate that there are huge differences in how spouses feel in their lives as newly-wed couples. In the following sections, it is studied whether there are systematic differences for some sub-groups as discussed in theories of the marriage market. We want to note that it might be critical to capture structural differences in reported life satisfaction when there are temporal effects affecting subjective well-being. We can test for the couples' characteristics affecting their life satisfaction under the condition that these characteristics also make for differences in partly transitory changes in reported well-being. This condition would, of course, not be fulfilled when there is full hedonic adaptation to a set point. However, a test is possible even when there is to some extent a satisfaction treadmill.[13]

a) Potential for specialization

One of the main predictions of Becker's theory of marriage is that the gain from marriage is positively related to couples' relative difference in wage rates (1974, p. S11). The reason is that a large relative difference in wage rates makes specialization between household production and participation on the labor market more beneficial.

The hypothesis is studied graphically in Figure 4. The sample is divided into a group of couples who have, on average, above median relative difference in wage rates and one with below median difference.[14] The averages presented are estimated ceteris paribus. However, not all the control

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[13] There is a further reason why we have to focus on the years around marriage: We measure the spouses' characteristics mentioned important in the literature at the time they marry (the relevant point in time given the theories being considered). So we get a relatively accurate picture of couples conditions right after marriage. Over time, people's labor market opportunities change, as well as their educational achievement. A diminishing of group differences is therefore to be expected.

[14] Relative wage rates can be calculated because each person in the sample is matched with the socio-demographic characteristics of his or her spouse. Shadow wage rates for years during which the respondent or his or her spouse was not in the active labor force are estimated by using a simple procedure. Wages are approximated by the wage earned before or after the break - whatever was chronologically closer. It is assumed that in case a person would start

variables mentioned for Figure 2 are included. As specialization is expected to provide benefits through increased household production, household income (as well as its close proxy education level) is not controlled for. The interaction variable between household income and being the child of the head of the household remains in the regression equation.

[Figure 4 about here]

Figure 4 shows that there are no systematic differences in subjective well-being for the two groups in the years after marriage. However, *before* marriage, those individuals who will be in marriages with large differences are less happy on average than those with small differences.[15] On average for the ten years before marriage, life satisfaction is lower by 0.15 score point. This indicates that couples with large differences benefit more from marriage. This is a finding that supports one of the main predictions in Becker's model based on the gains from specialization.

b) Actual specialization

Becker analyzes the factors for a beneficial division of labor between spouses, in particular the relative wage difference. The underlying assumption is that there are gains from the division of labor within the family. This assumption can be directly studied for actual specialization of German couples. A couple is considered fully specialized if one partner is employed full time, self-employed or on maternity leave, while the other partner is retired or does not, or only occasionally, participates in the labor market. The respective status is assessed separately each year. During the first 7 years of marriage, 31 percent fit the criterion of full specialization, while 46 percent are dual-income couples. Other combinations of labor market status represent 23 percent of the households. In order to apply a difference-in-differences approach, as in subsection a), it has to be studied whether individuals specializing during marriage reported systematically different well-being scores when they were unmarried. Two groups are formed according to whether an individual was living half or more than half of the observed number of years during the first seven years in a relationship with full specialization. Control variables are the same as for potential specialization in Figure 4.

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working again at the time of the interview, he or she would have to accept his or her last wage without general wage increases, or it is assumed that he or she could get as high a wage as the one he or she gets in the future.

[15] An F-test for the seven dummy variables that capture the differences in life satisfaction in the seven years before marriage is statistically significant at the 95 percent level.

Figure 5 shows the results of the analysis. The solid line indicates that couples specializing after marriage are better off in terms of life satisfaction than dual income couples. For the first seven years of marriage, the differences for full specialization are jointly statistically significantly different from zero (Prob > F = 0.07). However, before marriage, a small positive difference already seems to exist in subjective well-being between those who will specialize after getting married and those who will not, indicating some degree of selection. While there is some evidence for the specialization hypothesis, the actual division of labor might be more likely for intrinsically happier people.

[Figure 5 about here]

Full specialization in modern societies has a touch of conservatism. In particular, when it means that 96 percent of the cases follow the traditional role model of a husband going out to work while the wife takes care of the household and the children, and only 4 percent specialize the other way round. Specialization in this traditional sense has therefore often been criticized on the grounds of being pleasant for men but discriminating for women. To our surprise, a separate analysis for men and women brought up a completely different finding. Men in marriages with specialization are as satisfied as those in marriages without specialization, and the two groups show similar well-being patterns before marriage. In contrast, women who, after marriage, live in households with complete division of labor report, on average, much higher life satisfaction scores than their female colleagues who did not specialize. One explanation for this phenomenon could be the fact that women still do most of the housework, independent of whether they also participate in the labor market. The stress resulting from two jobs might reduce subjective well-being most markedly for women with children. Figure 6 indeed shows that specialization contributes in particular to the well-being of spouses with children.

[Figure 6 about here]

Both graphical analyses in this subsection present evidence for benefits from actual specialization. However, Figures 5 and 6 also indicate that, on average, these benefits are chronologically restricted. The gap in life satisfaction between specialized and non-specialized couples diminishes

with the number of years they are married. After eight years, the two groups report similar average satisfaction scores.

c) Differences in education

Numerous theories of marriage emphasize emotional support and companionship as sources of marital happiness, sometimes connected to shared beliefs and values. Often they are related to homogamous couples, for instance with regard to social status. Here, we look at couples' differences in the level of education, measured by the number of years of schooling. It is hypothesized that couples with small differences in the level of education gain more from marriage than those with large differences.

Figure 7 presents the result of a graphical analysis applying the same test strategy as in subsections a) and b).[16] Now the whole set of control variables as listed in Table 1 is included. For the years before marriage, there are no systematic differences in the well-being of people who end up in marriages with small and large differences in education. However, after marriage, couples with differences in education below the median report, on average, higher satisfaction with life. The average difference after marriage shown in Figure 7 is 0.13 units on the eleven point scale. For the first seven years, the joint statistical significance of the differences is higher than 99 percent. This finding supports the hypothesis that couples with similar educational background benefit more from marriage.

[Figure 7 about here]

4   Concluding remarks

Marriage is a fundamental institution in society. In this paper, we employ data on people's reported subjective well-being in order to study this institution. Knowledge about spouses' happiness or life satisfaction complements research on the effects of marriage on people's health and income. Insights from these analyses may contribute to the public discussion about the value of intact marriages and legislators' debates about marriage penalties in tax codes or the effect of

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[16] Note that there is almost no correlation between couples characteristics with regard to educational differences and differences in the (shadow) wage rate. From the 1,685 observations for the first year after marriage, there are 561 with small differences in wage rates, as well as educational achievements and 327 with large differences in both

welfare programs and social security on marriage. Moreover, empirical evidence on different couples' utility level can indicate through which channels they reap well-being in marriage. Economists, psychologists and sociologists emphasize quite different aspects and incorporate them in their theoretical models.

The starting point of the analysis was the solid finding in cross-disciplinary subjective well-being research that married people are happier or more satisfied with their life than singles. In our empirical analysis for German residents between 1984 and 2000, we try to refine this finding. We address two sets of hypotheses: selection and the so-called protection hypotheses.

We find evidence for selection: singles who we know will get married are happier than persons who will stay single, even after taking important observable socio-demographic characteristics into account. There is a strong age pattern in this selection effect. Those who marry young are on average singles with above average life satisfaction. By the age of 30, singles who will marry report no different subjective well-being than those who will not marry. After 30, the prospective spouses are again a systematically more satisfied selection. It is unlikely that these selection effects can explain the entire difference in well-being between singles and married people. Until age 34, married people, on average, report higher life satisfaction scores than those singles who will get married later. As the gap between the two groups is substantial, it is unlikely to be due to time patterns in selection, i.e. due to the larger selection effects for those marrying at a young age. Besides selection effects into marriage, we also find evidence for selection effects out of marriage. People who get divorced were not only less happy during marriage but also less happy before they got married.

Unobservable characteristics that are related to individuals' subjective well-being are not the only source of selection effects. It is likely that those people who expect to benefit the most from the respective marital status remain single or get married. Important complementary research has therefore to study widowhood and divorce, where changes in marital status may often occur unexpectedly. However, it is unclear how well people can predict the gains in well-being from marriage. Marriage patterns indicate that people do not seem to learn much. Therefore, marriage has been counted among the "behavioral anomalies" (Frey and Eichenberger 1996).

Gains from marriage or protection are studied following two lines of arguments. First, we find evidence that supports the specialization hypothesis emphasized in economics. Compared to their life satisfaction before marriage, couples with large relative wage differences, and thus a high

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characteristics. There are, however, also 463 respondents living in a partnership with large educational but small

potential gain from specialization, benefit more from marriage than those couples with small relative wage differences. Moreover, spouses practicing the division of labor report on average higher life satisfaction than dual income couples. Mainly women and couples with children benefit from actual specialization. However, the findings indicate that there are no systematic differences between the two groups after 7 years of marriage. Second, our results also support theories emphasizing the importance of similarities of partners. Similar or homogamous partners are expected to share values and beliefs in order to facilitate a supportive relationship. We find that spouses with small differences in their level of education gain, on average, more satisfaction from marriage than spouses with large differences. This sheds light on an aspect often neglected in the economic analysis of marriage: companionship. The enjoyment of *joint* activities or the absence of loneliness and the emotional support that fosters self-esteem and mastery are all important non-instrumental aspects contributing to the individual well-being of married people. These aspects are more difficult to study in econometric analysis than is the division of labor. Moreover, they are not only important in themselves, but may lead to different predictions in economists' models of the marriage market.

Future research in economics on the relation between marriage and happiness might study whether changes in social policy are reflected in single, married or divorced people's subjective well-being, and non-cooperative theories of marriage could be confronted with empirical findings for the utility distribution between spouses.

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wage differences and 324 who experience the opposite. Overall, a correlation of 0.042 is estimated.

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Appendix

Sample selection

The analysis in this paper is based on the scientific use data from the first 17 waves of the German Socio-Economic Panel Study. Observations from single people and married people are taken into consideration. For the selection analysis, people can be married for the first time or remarried. For marriage gains, only first marriages are taken into account. Persons with non-single entries before marriage are therefore dropped. Data coding allows for missing entries. However, when there are gaps of two or more years during marriage, the individuals are not included in the data set. This excludes the possibility that people can get divorced and re-marry during that period. The sample is also restricted to people who have no missing observations between their time as singles and as spouses. If there are missing observations, it is not possible to exactly determine between which two subsequent years people have married. People who indicate that they are married but live apart are not considered to be married when they are mentioned as being divorced the following year. However, if they are married and live apart either at the beginning of their marriage or for less than two years during their first marriage, they are considered to be married.

Table 1: MARRIAGE AND SATISFACTION WITH LIFE

Dependent variable: satisfaction with life

	Pooled estimations		Fixed-effect estimations	
	OLS	Ordered logit	OLS	Cond. logit
Single no partner	Reference group			
Single with partner	0.203	0.192	0.236	0.315
	(5.85)	(5.57)	(5.91)	(4.47)
Married	0.299	0.315	0.312	0.453
	(11.92)	(12.41)	(8.22)	(6.75)
x separated, with partner	-0.285	-0.226	-0.256	-0.414
	(-1.70)	(-1.29)	(-1.86)	(-1.64)
x separated, no partner	-1.035	-0.844	-0.718	-0.282
	(-4.97)	(-3.81)	(-4.08)	(-0.92)
Female (male=0)	0.092	0.090		
	(8.74)	(8.53)		
Log(years of education)	0.306	0.344	0.121	0.224
	(11.31)	(12.63)	(1.09)	(1.14)
Children (no children=0)	0.068	0.07	0.015	-0.042
	(4.20)	(4.33)	(0.83)	(-1.30)
Head of the household or spouse	Reference group			
Child of the head of the household	0.055	0.096	0.005	0.069
	(1.51)	(2.58)	(0.12)	(0.83)
Not child of the head of the household	-0.363	-0.333	-0.221	-0.307
	(-6.87)	(-6.14)	(-2.90)	(-2.26)
Log(household income)	0.323	0.331	0.180	0.223
	(32.74)	(32.33)	(14.72)	(9.77)
x child of the head of the household	0.185	0.206	0.081	0.123
	(4.49)	(4.74)	(1.95)	(1.64)
x not child of the head of the household	0.305	0.315	0.057	0.078
	(3.51)	(3.55)	(0.55)	(0.43)
No. of household members$^{1/2}$	-0.317	-0.345	-0.254	-0.258
	(-14.17)	(-15.19)	(-8.38)	(-4.66)
Age categories	---------- included ----------			
Employment status	---------- included ----------			
Year effects	---------- included ----------			
Number of observations	133952	133952	133952	106053

Notes: In the conditional (fixed-effects) logistic regression, the dependent variable is equal to one if reported life satisfaction is higher than 7. Variables not shown for age categories (seven variables), employment status (eight variables), place of residence (Old or New German Laender) and nationality (two variables). T-values in parentheses.
*Data source*: GSOEP.

Dependent variable: satisfaction with life

	Sample restricted to …		Specification …	
	heads of households or their spouses	heads of households or their spouses and age < 45	incl. no. of children	incl. individual fixed-effects
Single no partner	Reference group			
Single with partner	0.202	0.265	0.252	0.208
	(5.49)	(6.33)	(5.47)	(3.76)
Married	0.292	0.318	0.299	0.303
	(10.64)	(8.72)	(7.16)	(5.32)
x separated, with partner	-0.266	-0.072	-0.063	0.035
	(-1.55)	(-0.29)	(-0.25)	(-0.16)
x separated, no partner	-1.206	-0.913	-0.898	-0.514
	(-4.90)	(-3.29)	(-3.23)	(-2.12)
Female (male=0)	0.090	0.049	0.048	
	(8.26)	(3.26)	(3.15)	
Log(years of education)	0.301	0.249	0.242	0.096
	(10.70)	(6.63)	(6.41)	(0.47)
Children (no children=0)	0.105	0.062		
	(6.23)	(2.59)		
No child	Reference group			
One child			0.034	-0.030
			(1.26)	(-0.98)
Two children			0.073	-0.106
			(1.92)	(-2.41)
Three children			0.048	-0.084
			(0.89)	(-1.36)
Four children			-0.105	-0.232
			(-1.34)	(-2.55)
Five children			-0.375	-0.395
			(-3.19)	(-2.95)
Six children or more			0.378	-0.712
			(2.00)	(-3.06)
Log(household income)	0.334	0.343	0.343	0.241
	(33.49)	(23.01)	(22.92)	(12.28)
No. of household members$^{1/2}$	-0.373	-0.316	-0.280	-0.091
	(-15.38)	(-9.01)	(-4.59)	(-1.13)
Age categories	---------- included ----------			
Employment status	---------- included ----------			
Year effects	---------- included ----------			
Number of observations	124452	61744	61744	61744

Notes: Variables not shown for age categories (seven variables), employment status (eight variables), place of residence (Old or New German Laender) and nationality (two variables). T-values in parentheses.
Data source: GSOEP.

Table A.1: DESCRIPTIVE STATISTICS

	Mean	Std. dev.		Fraction
Satisfaction with life	7.083	1.83	Male	50.4%
Age	44.698	14.70	Female	49.6%
Years of education	11.162	2.49	No children	57.3%
Log(years of education)	2.390	0.21	Children	42.7%
No. of children in household	0.787	1.04	Head of household or spouse	92.9%
Household income per year in 1000 and In 1999 Mark at ppp	60.470	33.38	Child of head of household	5.9%
			Not child of head of household	1.1%
Log(household income)	3.967	0.58	Single, no partner	9.9%
No. of household members	3.201	1.34	Single, with partner	3.5%
No. of household members$^{1/2}$	1.752	0.36	Married	86.6%
			Separated, with partner	0.1%
			Separated, no partner	0.1%
			Employed	58.3%
			Self-employed	3.6%
			Unemployed	5.3%
			Sometimes working	2.2%
			Non-working	17.8%
			Maternity leave	1.3%
			Military or civil service	0.1%
			In education	1.6%
			Retired	9.8%
			Old German Laender	83.6%
			New German Laender	16.4%
			National	79.9%
			EU foreigner	9.5%
			Other foreigner	10.6%

Note: Descriptive statistics for observations included in table 1.
Data source: GSOEP.

Table A.2: SENSITIVITY ANALYSIS: EXCLUDING OBSERVATIONS AROUND MARRIAGE

Dependent variable: satisfaction with life

	Pooled estimations		Fixed-effect estimations	
	Coefficient	T-value	Coefficient	T-value
Single no partner	Reference group			
Single with partner	0.076	1.67	0.092	1.57
Married	0.308	11.25	0.314	5.13
x separated, with partner	-0.337	-1.90	-0.383	-2.63
x separated, no partner	-1.445	-5.63	-1.033	-4.65
Female (male=0)	0.094	8.55		
Log(years of education)	0.291	10.19	0.084	0.63
Children (no children=0)	0.083	4.84	0.022	1.18
Head of the household or spouse	Reference group			
Child of the head of the household	0.047	1.15	-0.012	-0.21
Not child of the head of the household	-0.320	-5.75	-0.144	-1.68
Log(household income)	0.330	32.17	0.182	13.99
x child of the head of the household	0.201	4.30	0.037	0.73
x not child of the head of the household	0.277	3.02	-0.011	-0.09
No. of household members$^{1/2}$	-0.306	-13.15	-0.258	-7.87
Age categories	---------- included ----------			
Employment status	---------- included ----------			
Year effects	---------- included ----------			
Number of observations	123936		123936	

Notes: Same estimations equations as in table 1. However, 10,016 obs. are excluded encompassing the three years before and after marriage. Variables not shown for age categories (seven variables), employment status (eight variables), place of residence (Old or New German Laender) and nationality (two variables).

Data source: GSOEP.
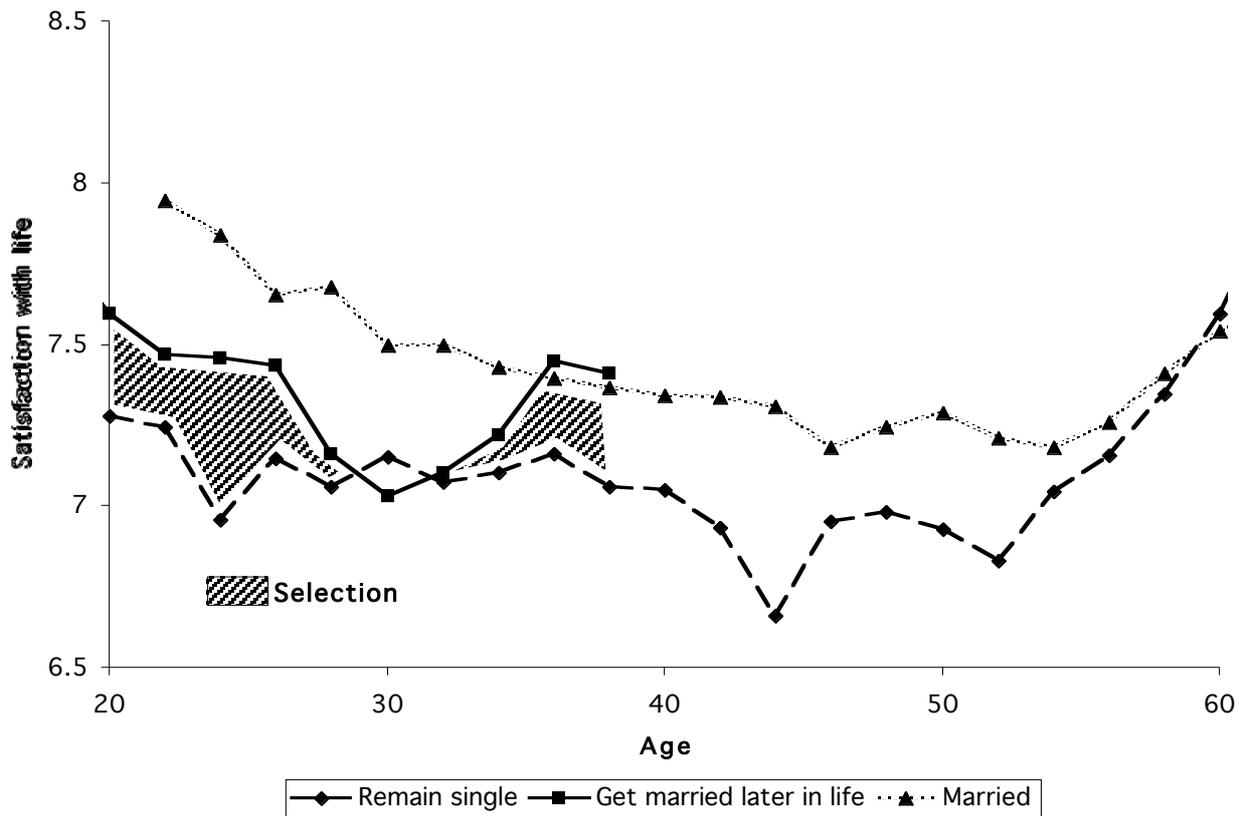
Figure 1: Do happy people get married?

Note: The graph represents the pattern of well-being after taking respondents' sex, age, education level, parenthood, household income, household size, relation to the head of the household, labor market status, place of residence and citizenship into account.
Data source: GSOEP.
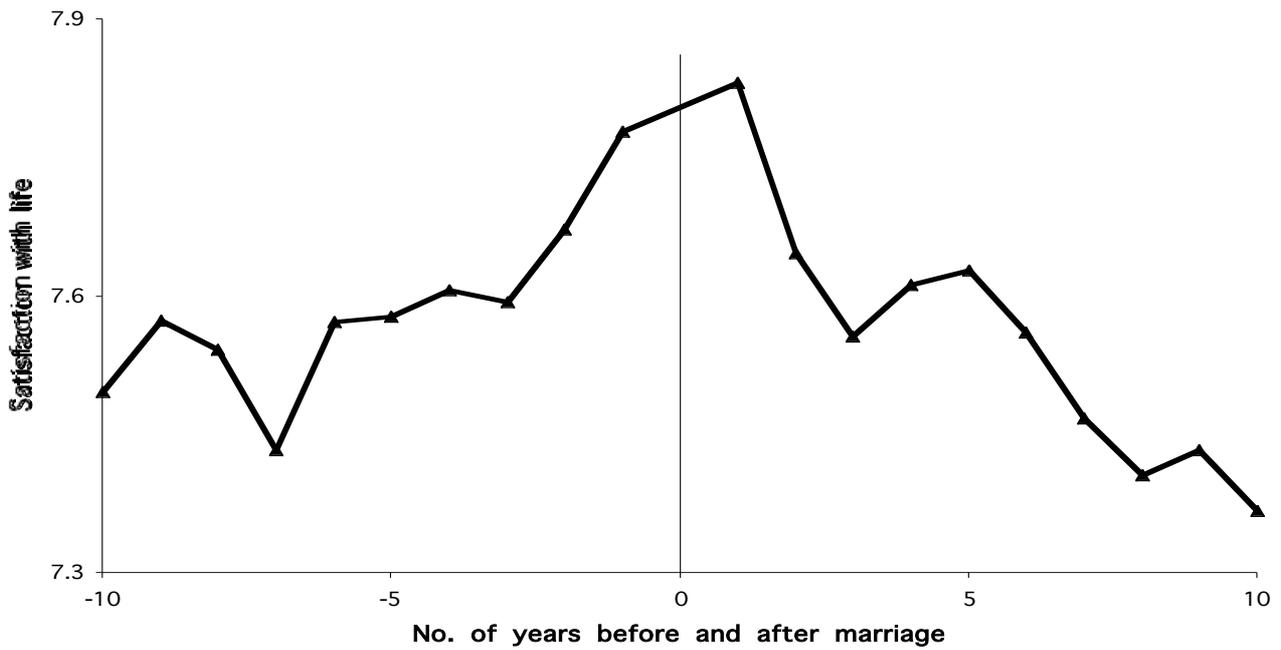
Figure 2: LIFE SATISFACTION AROUND MARRIAGE

Note: The graph represents the pattern of well-being after taking respondents' sex, age, education level, parenthood, household income, household size, relation to the head of the household, labor market status, place of residence and citizenship into account.
Data source: GSOEP.
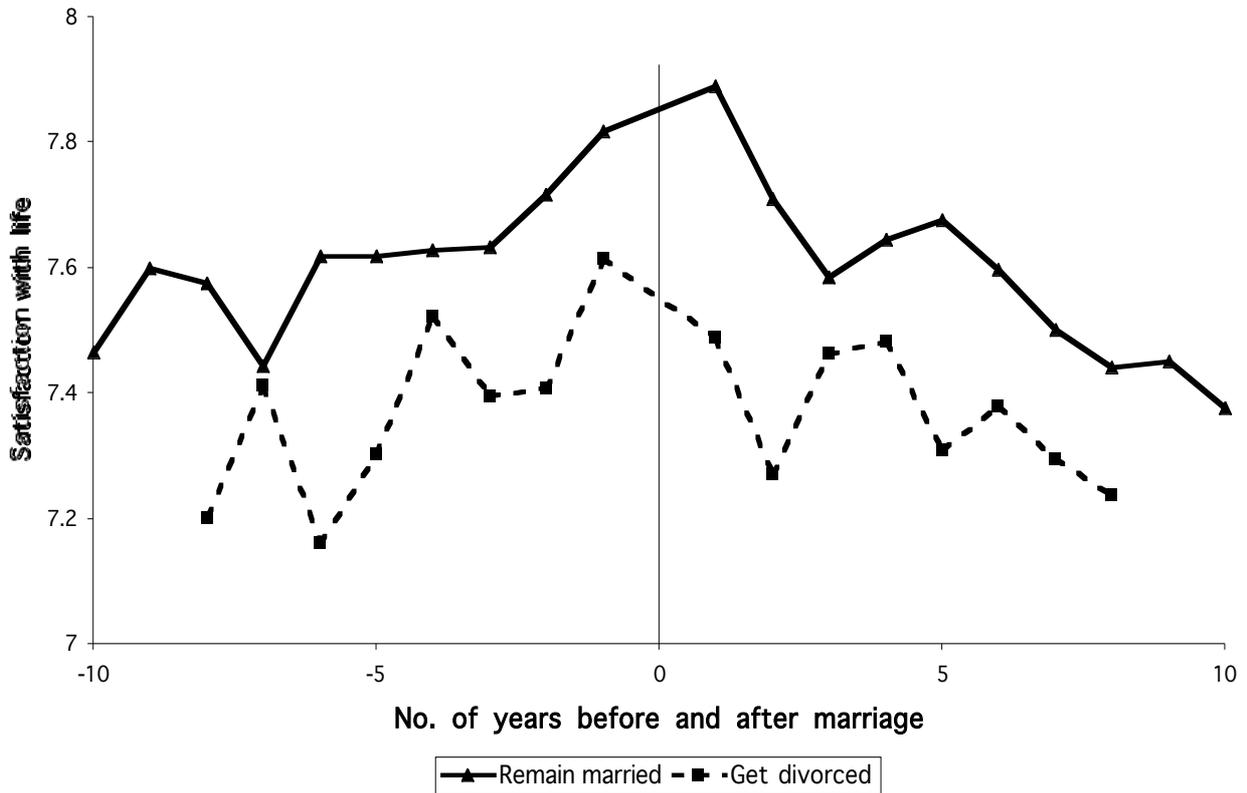
Figure 3: LIFE SATISFACTION AROUND MARRIAGE FOR COUPLES WHO STAY MARRIED AND COUPLES WHO GET DIVORCED

Note: The graph represents the pattern of well-being after taking respondents' sex, age, education level, parenthood, household income, household size, relation to the head of the household, labor market status, place of residence and citizenship into account.
Data source: GSOEP.
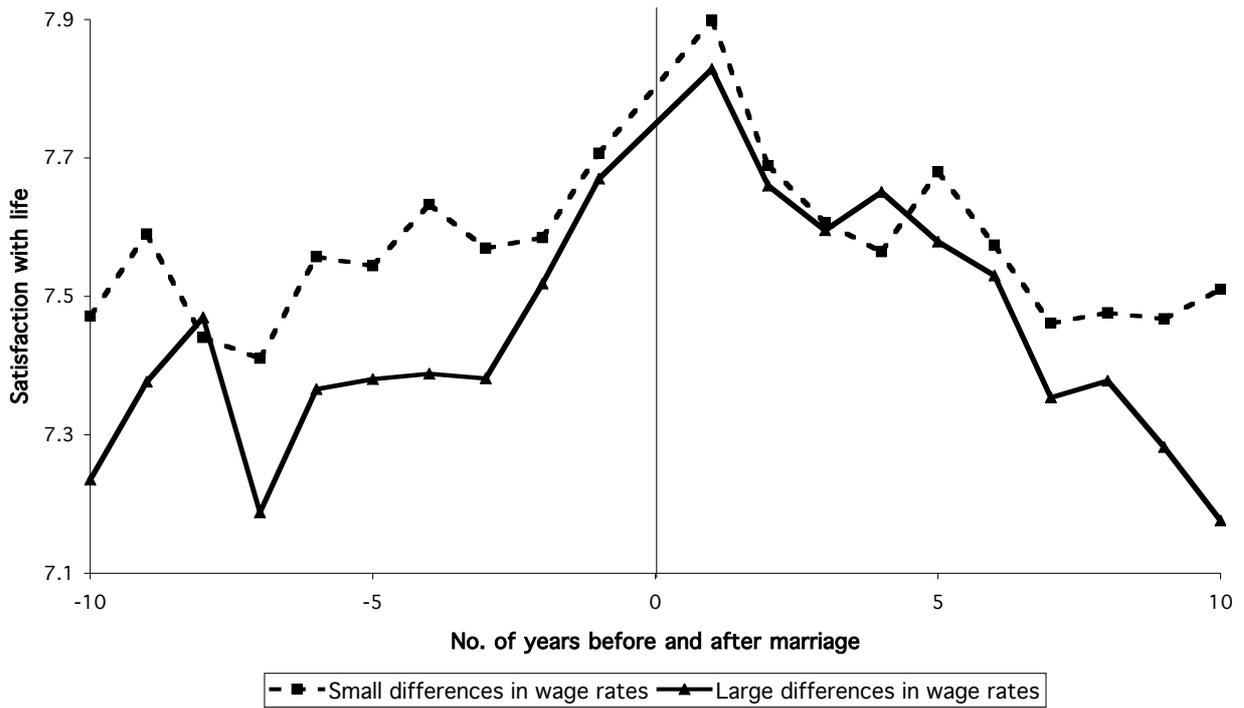
Figure 4: DIFFERENCES IN THE (SHADOW) WAGE RATE BETWEEN SPOUSES AND ITS EFFECT ON LIFE SATISFACTION AROUND MARRIAGE

Note: The graph represents the pattern of well-being after taking respondents' sex, age, parenthood, household size, relation to the head of the household, labor market status, place of residence and citizenship into account.
Data source: GSOEP.
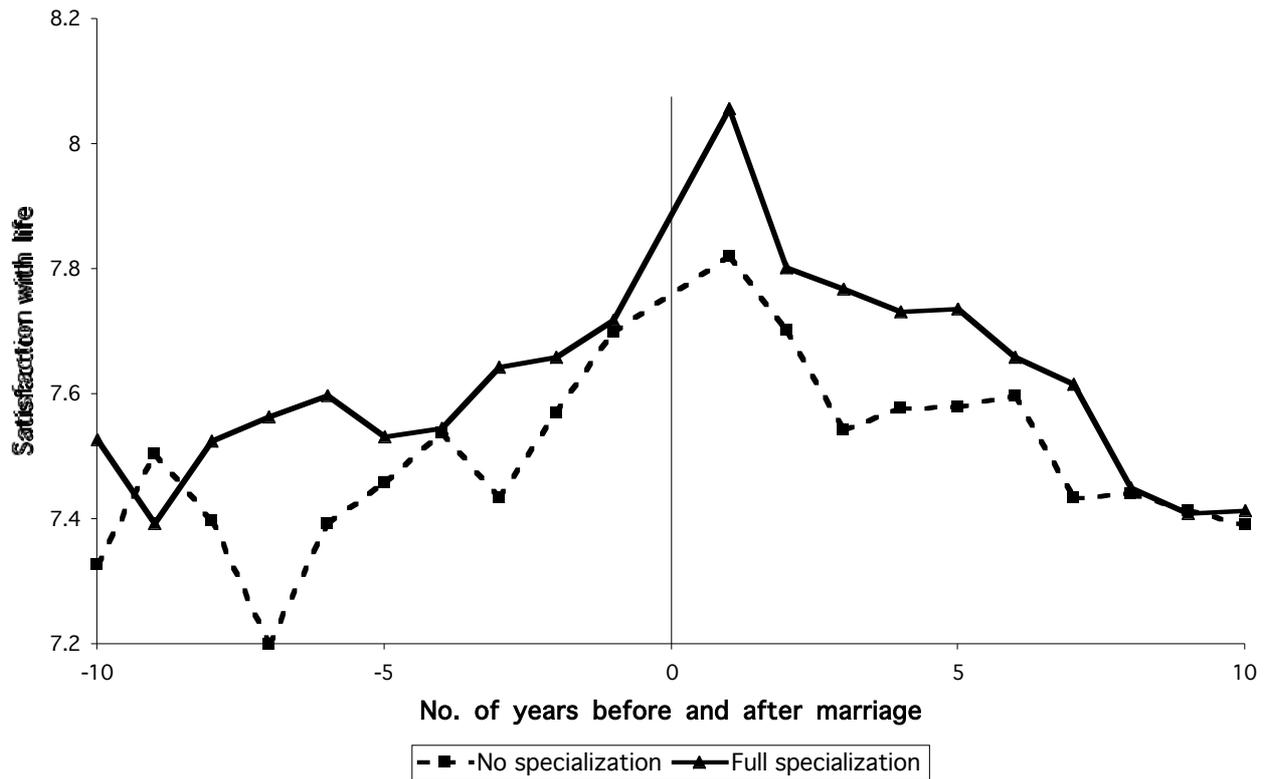
Figure 5: DIVISION OF LABOR BETWEEN SPOUSES AND LIFE SATISFACTION AROUND MARRIAGE

Note: The graph represents the pattern of well-being after taking respondents' sex, age, parenthood, household size, relation to the head of the household, labor market status, place of residence and citizenship into account.
Data source: GSOEP.
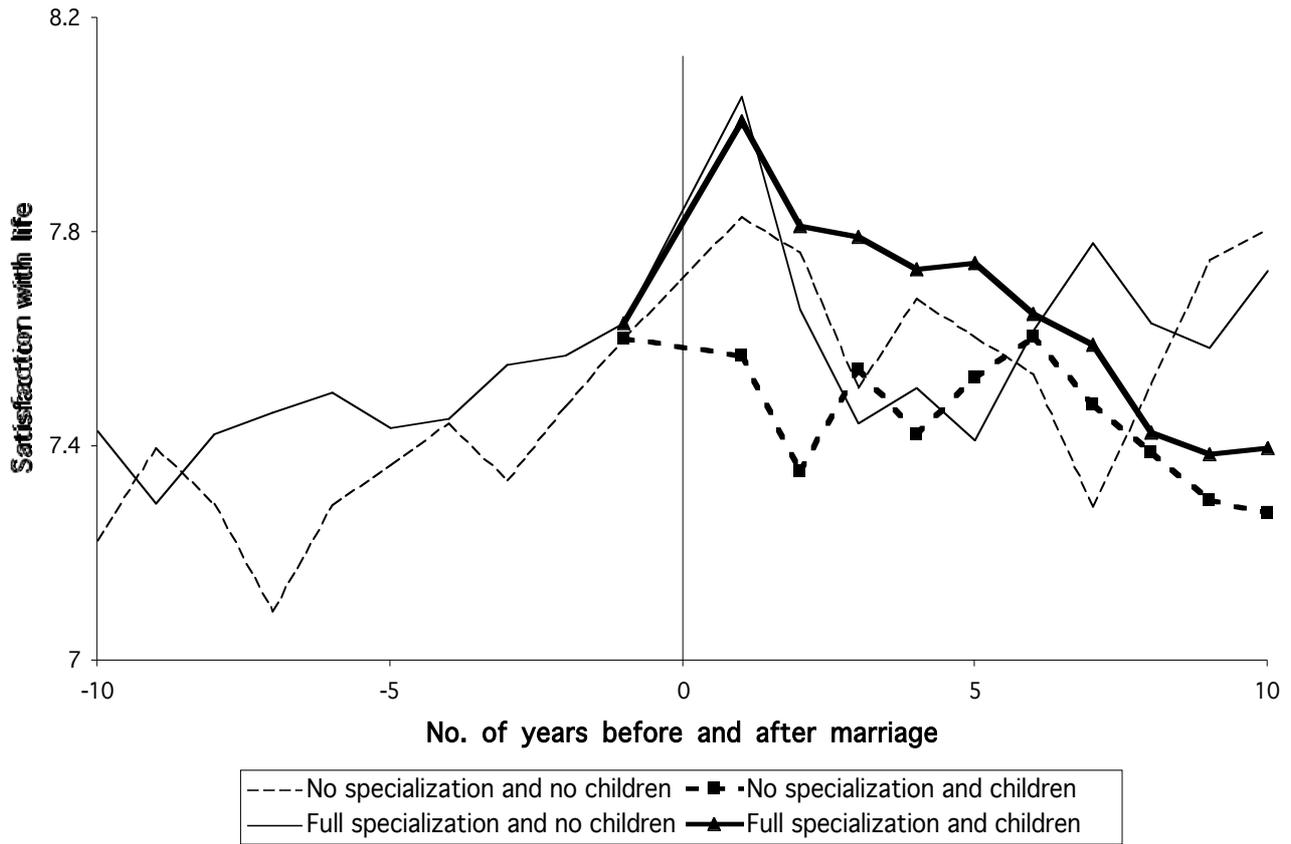
Figure 6: PARENTHOOD, DIVISION OF LABOR AND LIFE SATISFACTION AROUND MARRIAGE

Note: The graph represents the pattern of well-being after taking respondents' sex, age, parenthood, household size, relation to the head of the household, labor market status, place of residence and citizenship into account.
Data source: GSOEP.
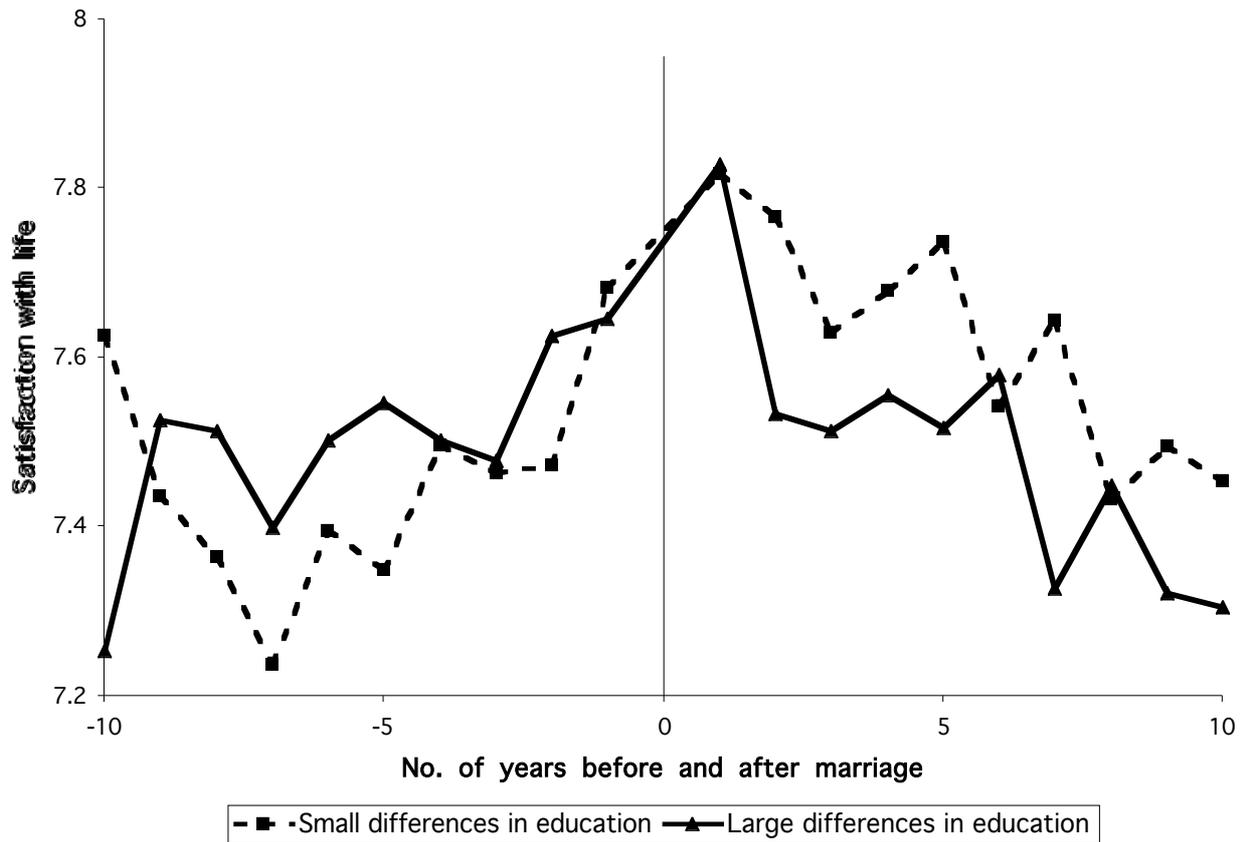
Figure 7: DIFFERENCES IN THE LEVEL OF EDUCATION BETWEEN SPOUSES AND ITS EFFECT ON LIFE SATISFACTION AROUND MARRIAGE

Note: The graph represents the pattern of well-being after taking respondents' sex, age, education level, parenthood, household income, household size, relation to the head of the household, labor market status, place of residence and citizenship into account.
Data source: GSOEP.

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