

Exploring Increasing Divorce Rates in West Germany: Can We Explain the Iron Law of Increasing Marriage Instability?

Michael Wagner,* Lisa Schmid and Bernd Weiß

Institute of Sociology and Social Psychology, University of Cologne, 50939 Cologne, Germany

*Corresponding author. Email: mwagner@wiso.uni-koeln.de

Submitted September 2014; accepted January 2015

Abstract

We investigate the upward trend of divorce rates in West Germany since the middle of the 1930s by testing hypotheses on the changing socio-structural composition of marriage cohorts and on changes of the divorce behavior of different socio-structural subgroups. Hypotheses were derived by linking the parameters of three theoretical micro models that explain marital stability—the exchange, the investment, and the microeconomic model—to four societal processes: factors that foster self-reinforcing processes, the transmission of divorce risks across generations, changing gender roles, and the deinstitutionalization of marriage. Empirical analyses use data from the German Life History Study (GLHS) and are based on six West German marriage cohorts between 1936 and 2005. The increasing divorce rates could not be explained by compositional or behavioral effects. Alternative explanations of historical trends of divorce rates are discussed.

Introduction

Intensive and ongoing research on the determinants of marital stability has identified a large number of risk factors, but it is widely unknown why there was a sharp and nearly continuous upward trend in divorce rates in many developed countries. This upward trend continued over a hundred years; it began at the end of the 19th century and stopped in some countries at the end of the 20th century. In some of these countries, however, the increase of divorce rates has not only come to an end but even turned around into a trend of decreasing divorce rates. An example is the US, where divorce rates seem to have reached a plateau in the 1980s, and it is being debated whether they have dropped substantially since then (Kennedy and Ruggles, 2014).

Despite the fact that in recent years cross-sectional statistics have suggested that the historical upward trend in the German divorce rates might have come to an end, longitudinal measures of divorce rates do not confirm a termination of an ‘iron law of increasing marriage instability’. Also, the latest marriage cohorts are characterized by higher divorce rates than their predecessors (Grünheid, 2013).

To many people, increasing divorce rates are obviously a ‘most troubling social development’ combined with the expectation of a general family breakdown (Willis, 1987: p. 72). From this perspective it is astonishing that demographers developed models to explain long-term trends of population growth, of mortality, and of fertility rates, but no model for a better understanding of the increase in divorce rates. In this paper

we cannot fill this research gap. But if we do not know which factors are responsible for the growth of divorce rates and which are not, no progress is possible in the development of models that would allow a prediction of future divorce trends, especially not any peaks of the divorce rates.

The lack of empirically tested demographic or sociological explanations for the trend of divorce rates may be astonishing because official statistics for divorce rates have been in existence since the beginning of the 19th century. For the kingdoms of Bavaria and Saxony, divorce statistics could be traced back until 1836 (Wolf *et al.*, 1959). Émile Durkheim used divorce data from the 1870s and 1880s to demonstrate that suicide might be a consequence of societal anomia (Durkheim, 1983). Although some divorce statistics existed already in the 19th century, the data required to explain divorce trends are not leading back so far. For instance, the time period during or before World War II is almost not accessible for quantitative micro-level social research.

A number of period effects during the historical development of divorce rates are striking. For example, divorce rates exploded in Germany after World War I and II and steeply dropped because of procedural reasons during periods of divorce law changes (1978/1979 in West Germany and 1991/1992 in East Germany). Whether these historical events—especially the changes of the divorce laws—have a long-term impact on divorce rates has been the subject of a number of empirical studies (e.g. Smith, 1997; Kneip and Bauer, 2009).

Until today, there is no consistent explanation for the long-term trend of rising divorce rates and there exist only few studies addressing this problem. The aim of this paper is to identify socio-structural factors that are responsible for the increase of divorce rates in subsequent marriage cohorts. We will investigate divorce rates in West Germany mainly after World War II by testing a number of hypotheses on the changing socio-structural composition of marriage cohorts and on changing effect sizes of divorce determinants. Our data stem from the German Life History Study (GLHS) (Mayer, 2008).

Theoretical Perspectives

There is still no theory that can explain the historical change of divorce rates. As a consequence one cannot derive a consistent set of hypotheses that may contribute to the explanation of divorce trends. There are a number of broad theoretical approaches that focus on socio-economic or cultural factors (Ruggles, 1997). For example, some scholars argue that the rise of divorce rates during

the last decades was a consequence of a number of trends that are summarized in the notion of the second demographic transition (Raymo *et al.*, 2004). Empirical research concentrates on the empirical test of single hypotheses that are neither linked systematically to a theoretical framework nor connected to each other.

From a cohort perspective, these changes concern the prevalence of certain individual characteristics across marriage cohorts (e.g. changes in the employment rate) or the strength of the association of these characteristics with the divorce rate (e.g. changing effect sizes of the employment status on the divorce rate). These two types of changes refer to *compositional* and *behavioral changes of marriage cohorts*. Many of these factors are a consequence of macro-level changes, such as educational expansion, increasing job opportunities for women or the liberalization of divorce laws. Since many explanations of trends in divorce rates rely on macro factors, it is unavoidable for a deeper understanding of divorce trends to relate hypotheses on the change of divorce rates to a micro-model of marital stability. This model should specify the influence of macro-social factors on marital decision processes. These decisions are the basis of micro-macro-links and the aggregated output of these decisions constitutes the divorce rate.

As every more theory-driven investigation of divorce rates at the macro level has to start with a micro-model, we will outline three models that are supposed to identify the most important factors for marital stability: the exchange model, the investment model, and the micro-economic model. The three models have many ideas in common, but they put different weights on the social forces resulting in marital instability.

From an *exchange perspective* (Lewis and Spanier, 1979), three proximate (subjective) factors are relevant: the quality of a marriage, the barriers to divorce, and the attractiveness of alternative opportunities. The quality of a marriage is linked to the partners' evaluation of their relationship and is often defined as marital satisfaction. The level of satisfaction results from the exchange of resources between the partners. Examples for these resources are emotional support, money, instrumental support, or time. The degree of satisfaction with the marriage depends on the relation between gains and costs from the exchange between the partners. Barriers to divorce can be defined as social norms that demand the continuation of a marriage even if its quality or the likely cost of its dissolution is low. From an exchange perspective the notion of a comparison level is an important concept. The standard of comparison is constituted by the partners' experiences and social norms. The marriage will be divorced if and only if the utility of

alternative living arrangements exceeds the utility of the existing marriage. The so-called comparison level is the lowest level of utility that a partner accepts in the face of available alternatives to the existing marriage.

The *investment model* by [Rusbult \(1983\)](#) builds on the interdependence theory ([Thibaut and Kelley, 1961](#)) and extends the exchange model by the notions of investment and commitment. Investments are resources that are linked to the partnership and lose their value in case of a separation or divorce. Commitment stands for subjective obligations to maintain the partnership and for the extent the partners hold long-term perspectives on their marriage and make sacrifices for their relationship ([Amato et al., 2007](#): p. 251). The investment theory argues that the extent of investments into a marriage is important for the understanding of marital stability, as it increases the commitment which in turn stabilizes a marriage.

According to the *microeconomic model* of divorce ([Becker et al., 1977](#)), the return of a marriage results from the utility of a marriage in relation to the utility of alternative living arrangements. The utility of a partnership depends on the partner match which can be sub-optimal because of imperfect information on the partner. The more intensive the partner search on the marriage market—indicated by a non-marital cohabitation and a late marriage—the higher is the level of information on the partner before marriage, the less likely is a mismatch.

On the basis of these three theoretical approaches, explanations of the historical change of divorce rates can be linked to internal and external marriage parameters that regulate marital decision processes: marital quality and investments, partner search, barriers, and the attractiveness of alternative living arrangements. We distinguish between four societal processes that are likely to have a macro-micro impact on the partners' divorce behavior: a changing opportunity structure to find a new partner that may initiate self-perpetuating or even self-reinforcing processes, the transmission of divorce risks across generations, changes of the gender roles, and the deinstitutionalization of marriage.

[Diekmann \(1994\)](#) argues that the change of divorce rates can be understood as a consequence of two *self-perpetuating processes*: First, increasing divorce rates should increase the *pool of available alternative partners*. This in turn is likely to raise divorce rates. Second, a higher proportion of divorcees is likely to have a negative impact on the extent by which divorcees are stigmatized. A decreasing stigmatization of divorcees reduces the barriers of getting divorced and may lead to increasing divorce rates ([Diekmann, 1994](#)).

[Teachman \(2002\)](#) argues that if there are strong *barriers to divorce* the effects of risk factors of divorce may be suppressed. Although we cannot test this hypothesis one can predict: The higher the divorce rate, the greater is the pool of alternative partners and the less stigmatized are divorcees. This again contributes to a further increase of the divorce rate. One can further assume that in periods with high divorce rates people are more skeptical about the stability of their own marriage (see also *H3*). Therefore, we hypothesize: *The more reluctant partners are to invest resources in their partnership the lower is marital stability, which in turn results in (a self-perpetuating process of) increasing divorce rates (H1)*. In this paper, we will concentrate on two types of investments, namely children and homeownership.

The *transmission of the divorce risk* across generations also generates a feedback loop resulting in increasing divorce rates in subsequent generations. Increasing divorce rates are likely to increase the number of children of divorce. As divorce risks are transmitted from one generation to the next generation (e.g. [Wagner and Weiß, 2003](#)), this should be another mechanism that explains increasing divorce rates. Such a mechanism is put into practice if the risk of transmission does not change across cohorts, and marriage and fertility rates do not differ too much between children of divorce and children from intact families (see also [Diekmann and Engelhardt, 1995](#)). As [Arránz Becker](#) shows (2008: p. 273), children of divorce experience more conflicts in their union compared to children that grew up with both parents. Therefore, a decreasing quality of marriages might be a consequence of being a child of divorce. [Diekmann \(1994\)](#) assumes that parents' divorce impacts the children to expect their own marriage to be less stable. As a consequence, they invest fewer resources in their partnership and more resources in their human capital and job career. These considerations lead to the following hypothesis: *The transmission of the divorce risk across generations is likely to generate an increasing proportion of children of divorce in subsequent marriage cohorts, which in turn should result in increasing divorce rates (H2)*.

The rise of the *educational and economic opportunities for women* is one of the most important aspects of the changing gender roles and a prominent explanation for increasing divorce rates. From the position of Becker's microeconomic theory it has been argued that the higher the earnings of married women the lower is the division of labor between the marital partners and the higher is the wife's economic independence from the husband. Classical theorists like [Durkheim \(1992\)](#) and [Parsons \(1964\)](#) already have emphasized that the

solidarity in the marriage is based on the division of labor, which avoids a competitive situation within the marriage. Oppenheimer criticized this position and claimed that women's employment would have a stabilizing effect (Oppenheimer, 1997). The economic independence of women can also be strengthened if women who get divorced are entitled to receive financial support from the state. Economists and sociologists have debated much about the consequences of this kind of welfare policies for marital stability. It has been claimed that welfare benefits for single mothers reduce women's propensity to stay married or to marry. Instead, welfare benefits for two-parent families should increase the utility of marriage (Lewin, 2005). It is unclear how women's economic independence from their partners affects the decision to divorce: Wife's employment can reduce the gains from marital exchange and therefore reduces marital quality and satisfaction. It is also possible that employed women invest less in their marriage, as they do not disclaim an occupational career in favor of homework or childcare. Furthermore, alternative living arrangements become more attractive if women who get divorced are able to make their living. In contrast to these assumptions one can also argue that woman's employment and income contributes to the living standard of the couple. Moreover, employed women are possibly more satisfied with their life. This is likely to have positive effects on the marital quality and stability. Nevertheless, as many studies show that women's employment increases the risk of divorce (Kalmijn, 2007; see also Willis, 1987; Becker, 1991), we expect that as *women's employment rates increase across marriage cohorts, this should contribute to a rise of the divorce rates in subsequent cohorts (H3)*.

The effect of rising divorce rates caused by an increase in women's employment rates may actually initiate another social process, which finally weakens the effect of women's employment. Diekmann (1994) argues that it is probable that in periods of high or increasing divorce rates, women anticipate that their own marriage may end in a divorce. Therefore, they ensure themselves against the risk of divorce by taking employment and by striving for an own occupational career to be financially independent from a male breadwinner. While women in earlier marriage cohorts take employment to be able to exit an unsatisfying marriage, women of younger cohorts are precautious and their employment reflects a provision for the case of a divorce. Nowadays most women are gainfully employed independently of the quality of their marriage, whereas in earlier times especially those entered employment who lived in low quality marriages. Therefore, one can argue

that *the effect of woman's educational level and employment status on the divorce risk decreases across marriage cohorts (H4)*.

The *deinstitutionalization of marriage* and the rise of individualism—or as Amato *et al.* (2007: p. 11) put it 'From Institutional to Individualistic Marriage'—constitute an important framework for understanding the social change of marriage. The deinstitutionalization of marriage can be conceived as one dimension of the second demographic transition. From this perspective the social norms that regulate marital life became weaker and the claim to get personal needs fulfilled in a marriage became more important. The decreasing normative regulation of the marriage is expressed in the liberalization of divorce laws, out of wedlock births, decreasing marriage rates, as well as an increasing age at marriage combined with an increasing proportion of close relationships living in a cohabitation. An upward trend in the age of marriage, however, might lead to a positive selection of those who marry; it should improve the partner match. Therefore, we propose: *The higher the mean age at first marriage the lower the divorce rate, insofar one can state that as age at first marriage increases across cohorts divorce rates will decrease (H5)*.

The deinstitutionalization of marriage is also a consequence of a declining influence of religion on marital life. Religious people are less likely to divorce, because religious beliefs are a barrier to divorce. A decreasing proportion of religious people should increase divorce rates. Even if the liberalization of the divorce law does not seem to influence the divorce trends in the long-term (Smith, 1997), it contributes to a reduction of the legal barriers to divorce and of a declining stigmatization of divorcees. The rise of the individualistic marriage points to a more egalitarian marriage, an increasing importance of a satisfying exchange between the partners. It can be claimed: *The higher the proportion of married people who are not religious, the higher the divorce rate. Thus, an increase in the proportion of married who are not religious will result in an increase of divorce rates across marriage cohorts (H6)*.

These hypotheses refer to compositional changes of marriage cohorts and behavioral changes in certain subgroups of the married. Compositional effects are stated by hypotheses H1, H2, H3, H5, and H6: These five hypotheses state that the distribution of marital investments, proportion of children of divorce, being employed, mean age at marriage and religious affiliation differ across the marriage cohorts. Behavioral changes—changing divorce rates of subgroups of marriage cohorts—are stated in hypothesis H4 which claims a

decreasing effect of the educational level and the employment status on marital stability.

Previous Research

One of the first countries where divorce rates leveled off was the US. Between 1980 and 1987 there was a 10 percent decline in the crude divorce rate, but it was still predicted that two-thirds of all first marriages would be divorced (Martin and Bumpass, 1989). Another country where the divorce rates leveled off is Sweden (Pailhé *et al.*, 2014). Also in Germany, the rise of period-specific divorce rates seems to have come to stop. But divorce rates according to subsequent marriage cohorts reveal that only divorce rates of marriages with a shorter duration decreased; divorce rates of marriages of longer duration are still increasing (Grünheid, 2013).

Studies aiming to identify compositional or behavioral explanations of divorce trends across historical time led to mixed results. Goldstein (1999) argued that in the US compositional changes might be responsible for the trend of divorce rates. He assumed that these changes involve the aging of baby boomers, the increase of age at first marriage, an end of the rise of remarriages, and an increase of cohabitation rates. Goldstein used retrospective female marital histories from the Current Population Survey 1990 and 1995. His analysis of period divorce rates revealed that these compositional effects could not account for the trend of rising divorce rates.

Teachman (2002) analyzed data from five rounds of the National Survey of Family Growth (NSFG) that were gathered between 1973 and 1995. He focused on first marriages from 1950 to 1984. He investigated changes of the marriage and divorce behavior according to marriage age, educational level, premarital childbirth, stability of parents' marriage, religious affiliation, race, age and educational homogamy, and cohabitation. A number of models with the interaction effect between a predictor variable and the year of marriage revealed that only the effects of race on divorce rates increased across time. The divorce rates of whites rose faster than the divorce rates of blacks.

In contrast to Teachman (2002), Heaton (2002) tried to explain the trend of divorce rates in the US since 1975. He analyzed the NSFG of the year 1995. He argues that changes in the divorce rates result from different subgroup compositions and changes in subgroup rates. For our purposes it is especially important that he found—on the one hand—that increasing age at marriage accounts for a decline in divorce rates and—on the other hand—the effect of age at marriage decreases

across historical time. Also the educational level of the respondents increased across historical time. A high educational level lowers the dissolution risk and its stabilizing role increases across historical time. Heaton (2002) summarizes that a rising age at first marriage and increased education are the most important factors explaining the decrease of divorce rates in the US.

Also other studies revealed that the effect of the educational level changed across historical time. Using data of the German Life History Study, Wagner (1997) found for West Germany that the divorce risks of partners with a low and a high educational level became more similar across first marriage cohorts. De Graaf and Kalmijn (2006) found for the Netherlands that the effect of education on the divorce risk turned from a positive to a negative sign. For Italy, Salvini and Vignoli (2011) could demonstrate similar patterns. Härkönen and Dronkers (2006) investigated divorce risks in 16 European countries and the United States. They analyzed data from the Family and Fertility Surveys that were collected between 1989 and 1999. In nine of the seventeen countries¹ the educational gradient of divorce became more negative. A meta-analysis of European divorce studies also shows that the positive effect of education on the divorce rate decreased (Matysiak *et al.*, 2014).

Although it is debated whether the intergenerational transmission of divorce declined (Li and Wu, 2008; for an overview see Wolfinger, 2011), this trend was confirmed for the US by Wolfinger (1999, 2011). Amato and Cheadle (2005) as well as Teachman (2002) showed for the US that the transmission effect was quite stable over time or did not decrease significantly. Diekmann and Engelhardt (1999) as well as Engelhardt *et al.* (2002) report similar results for Germany. Wagner (1997) found for West Germany a significant transmission effect for the marriage cohorts in the 1960s and early 1970s, the effect was insignificant for older and younger marriage cohorts.

Considering the results of the studies mentioned above, it becomes obvious that previous research was not very successful in explaining the historical trends of divorce rates.

Data, Variables and Methods

Data

Our data come from the German Life History Study (GLHS), which includes life histories of 20 single-year birth cohorts between 1919 and 1971. The first wave of the GLHS ('Lebensverläufe und sozialer Wandel', LV I) was realized between 1981 and 1983 and includes the

birth cohorts 1929–1931, 1939–1941, and 1949–1951. The second wave of the GLHS ('Die Zwischenkriegskohorte im Übergang zum Ruhestand', LV II) encompasses the birth cohorts 1919–1921, interviewing took place between 1985 and 1988. Life history data of the birth cohorts 1954–1956 and 1959–1961 were collected in a third wave in the year 1989 ('Berufszugang in der Beschäftigungskrise', LV III). A fourth wave was launched 1998–1999 and included the birth cohorts 1964 and 1971 ('Ausbildungs- und Berufsverläufe der Geburtskohorten 1964 und 1971 in Westdeutschland', LV IV). The latest wave ('Arbeiten, Wohnen und Familie in der mobilen Gesellschaft', LV IV Panel) was realized 2004–2005 and comprises a further interviewing of members of the birth cohort 1971. A detailed description of the GLHS is provided by Brückner (1989), Hillmert *et al.* (2004), Matthes *et al.* (2014), and Wagner (1996).

We restrict our analyses to West Germany, because the divorce trends differ between East and West Germany and also the socioeconomic conditions of marital stability vary significantly between East and West (Wagner, 1997). The samples were drawn from the German population (LV I, LV II, LV III) or the German-speaking population (LV IV) of the respective birth cohorts living in private households. To harmonize the samples, we excluded 21 respondents of the birth cohorts 1964 and 1971 with a foreign nationality. Since women's reports about the marital history are more reliable than men's (Bumpass *et al.*, 1991; Wagner, 1997), we will use a subsample of 3,234 women's first marriages. Furthermore, some important variables are not measured for the first marriage if a male respondent has been interviewed and the current or last marriage is not the first marriage. As we restrict our analysis to first marriages, a comparison with official data is difficult to realize. However, a potential underestimation of divorce rates is less harmful, as we do not want to extrapolate the divorce rates but to compare divorce risks between marriage cohorts.

We transformed first marriages from birth cohorts into six marriage cohorts (number of first marriages): 1936–1945 ($n=507$), 1946–1955 ($n=457$), 1956–1965 ($n=402$), 1966–1975 ($n=491$), 1976–1985 ($n=583$), and 1986–2005 ($n=794$). Because the GLHS-studies collected life course data of cohorts at varying ages the observed mean duration of the marriages varies from cohort to cohort. The mean duration of the marriage cohort 1936–1945 is 27 years, for the cohort 1986–2005 it is only 7 years. The latter is a consequence of the low mean age at interview in the younger waves. As we use marital duration as a control

variable we hope to avoid a misinterpretation of the empirical findings. Moreover, in addition to performing the multivariate analyses on the basis of marriage cohorts, we also estimated multiple regression models on the basis of birth cohorts. The results are almost identical; the investigation of divorce trends is not biased when using marriage cohorts.

The retrospective data on first marriages are converted into a person-year file. This file contains 50,896 person-years.

Measures

This subsection informs about the operationalization of the variables (Appendix Table A1). *Marital instability* is indicated by a separation or divorce of a marriage. We only consider separation as an event if the marriage was separated and not (yet) divorced. Of the 3,234 first marriages, 395 marriages were separated or divorced, that is 12 per cent of all first marriages. Eighty-eight per cent of all first marriages existed until the date of the interview or ended through the death of one partner. The mean *age at marriage* is 23.3 years in the sample. The minimum *duration of marriage* is 1 year, whereas the maximum duration is 51 years. We regard the birth of a child and homeownership as *marital investments*. When the time-dependent dummy variable *child* is 1, it indicates that at least one child is born before or during marriage, which does not need to be the couple's biological offspring. As long as the respondent is childless the variable *child* is 0, which is true for 13 per cent of all first marriages. We also consider whether the respondents lived at least once during their marriage in an own home. According to this definition, 52 per cent of all the respondents are categorized as *homeowners*. *Religious affiliation* was measured at the time of the interview. If women are without a religious affiliation, the variable is coded 1, otherwise it is 0. About 9 per cent are not a member of a religious community at all. About 7 per cent of all respondents have experienced the *absence of at least one parent* due to separation or divorce of the parents. Unfortunately, the reason for parental absence is not available for LV II. Therefore, only 2,465 respondents have valid values for this variable. The variable *educational attainment* is trichotomous. The lowest level captures women who did not finish school at all or who obtained a 'Volks-/Hauptschulabschluss/Polytechnische Oberschule mit Abschluss Klasse 8' (60 per cent, $n=1,944$). The second level includes all women with a 'Realschulabschluss', a 'Polytechnische Oberschule mit Abschluss Klasse 10', or a 'Erweiterte Oberschule ohne Abschluss' (27 per cent, $n=866$).

Finally, the highest level is assigned to those women who obtained the ‘Fachhochschulreife’ or ‘Abitur’ (13 per cent, $n = 424$). Women’s *employment status* was measured time dependently. The variable switches from 0 to 1 if a women is employed—whether full-time or part-time. The variable is 0 again if the woman leaves the job. For bivariate analyses we use the time-independent variable if the female respondent has ever been employed during the marriage, which is the case for 78 per cent of the women.

Analytical Approach

In this study, discrete-event history models are employed (Allison, 1982; Singer and Willett, 2003). Based on person-period data, multiple binomial logistic regression models are estimated. The hazard rate $h(t_{ij})$ as a function of $p = 1, \dots, P$ predictors can be expressed as follows:

$$h(t_{ij}) = \Pr(T_i = j | T_i \geq j; \mathbf{x}_{ij}) = \frac{e^{\beta_0 + \beta_1 x_{ij1} + \dots + \beta_p x_{ijp}}}{1 + e^{\beta_0 + \beta_1 x_{ij1} + \dots + \beta_p x_{ijp}}}$$

where \mathbf{x}_{ij} is a $P \times 1$ vector of predictors and x_{ij1} denotes individual i ’s values for the first predictor in time period j . To model a sickle-shaped process (see Appendix Figure A3), the hazard rate is modeled as a function of time and the logarithm of time (Klein and Stauder, 1999; Klein, 2003).

We start our empirical investigations with a description of the marriage cohorts according to our predictor variables (Tables 1 and 2). In a second step, we present survival curves (Kaplan–Meier estimates) and run bivariate log-rank tests to obtain first insights into the associations between the predictor variables and the likelihood of divorce.

In the next step, we focus on the analysis of compositional and behavioral changes. In order to identify *compositional effects*, we start with a multiple regression model that incorporates marriage duration and cohort (reduced model). If cohort differences are due to the compositional structure of an individual characteristic, then this cohort effect will diminish when we control for that particular individual characteristic (full model) (Salvini and Vignoli, 2011). Therefore, we need to compare regression coefficients across models with varying covariates. In the case of logistic regression models, the magnitude of a regression coefficient not only reflects the effect of the respective predictor but also the degree of unobserved heterogeneity in the model (Allison, 1999; Mood, 2010). One approach that allows comparisons across models is to calculate the so called average marginal effect (AME). An AME represents the average

effect (here: in percentage points) of a predictor on the probability of an event; we also consider the AMEs easier to interpret than the commonly used odds ratios or log-odds ratios. The presentation of the AMEs from the reduced and the full model is accompanied by their respective confidence intervals. A simple yet not comprehensive test for differences in the AMEs for a marriage cohort between the reduced and the full model is to check for overlapping confidence intervals. If the confidence intervals of the two AMEs do not overlap and given that the AME from the full model is smaller than the AME from the reduced model, then we have empirical evidence for a composition effect. If the confidence intervals of the two AMEs do overlap, however, it still can be the case that the two AMEs are statistically different (Schenker and Gentleman, 2001). So, ideally, we could apply a test that tests if the difference between two AMEs is statistically different from zero. To the best of our knowledge, though, such a test does not exist. Therefore, we test if the *difference of the regression coefficients* (log-odds ratios) of the reduced and full model is statistically different from zero. As previously mentioned, we cannot compare odds ratios or log-odds ratios that were estimated in different models. This issue, however, is discussed by Karlson, Holm, and Breen (khh) (2012). They propose the so-called ‘KHB method’ to test for those differences. Using the Stata program khh (Kohler *et al.*, 2011), we can test if the difference between two regression coefficients is statistically significant.

Behavioral changes can be found by including interaction terms between cohort and predictor. Since it is well known that interaction effects in logistic regression models are hard to interpret, we will facilitate the interpretation with plots of the estimated divorce probabilities.

Empirical Results

Descriptive and Bivariate Findings

In the following, we focus on the compositional aspects of our sample and on descriptive survival plots. In Table 1 we provide mean values and proportions for the predictor variables by marriage cohort. For a comparison of cohort-specific divorce rates, we refer to a marriage duration of 10 years. Ten per cent of the first marriages were separated or divorced during this time period. The women’s age at first marriage varies considerably across cohorts. In the oldest cohort, the mean age of marriage was 21 years, whereas in the youngest cohort the mean age of marriage is about 25 years.

Table 1. Mean values by marriage cohort (women)

Marriage cohort	N	Divorce/ separation ^a	Age at marriage	Ever employed (during marriage)	Child	Homeowner	Parental divorce	Without religious affiliation
1936–1945	507	0.13	20.00	0.76	0.95	0.44	– ^b	0.07
1946–1955	457	0.03	24.60	0.66	0.91	0.61	0.02	0.04
1956–1965	402	0.02	24.00	0.71	0.92	0.64	0.04	0.04
1966–1975	491	0.09	21.66	0.80	0.88	0.58	0.05	0.07
1976–1985	583	0.21	22.36	0.84	0.84	0.52	0.06	0.12
1986–2005	794	0.11	25.34	0.86	0.79	0.42	0.11	0.14
Total	3,234	0.10	23.29	0.78	0.87	0.52	0.07	0.09

^aAfter 10 years of marriage.

^bNot available.

Source: GLHS.

Due to WWII we do not observe a linear trend for the age of marriage, i.e. the cohorts that married right after the war are older than the cohorts in the 1960s. Among all cohorts the proportion of women ever employed during their marriage is 78 per cent. From the marriage cohort 1946–1955 onwards this proportion increases from 66 to 86 per cent in the youngest cohort. In contrast, parenthood shows a negative trend among marriage cohorts (from 95 to 79 per cent), which to some extent might be due to the fact that the period of observation for the youngest cohort is much shorter. The same limitation applies to homeownership. With the exception of the three oldest cohorts (44, 61, and 64 per cent), we observe a negative trend for homeownership (from 58 to 42 per cent). Table 1 also shows the proportion of respondents that experienced a parental divorce. For the oldest cohort, there are no data available. In the remaining cohorts, the proportion is increasing (from 2 to 11 per cent). The proportion of married women without a religious affiliation is relatively high in the two youngest marriage cohorts.

The composition of women's educational attainment by marriage cohort is given in Table 2. The table reflects the results of the West German educational expansion during the last 50 years. In the oldest cohort, more than three quarters of all women have a low level of educational attainment but less than 5 per cent have 'Abitur' or 'Fachhochschulreife'. In contrast, in the youngest marriage cohort more than one quarter of all women gained the highest level of educational attainment, whereas the proportion of women with a low level decreased to 28 per cent.

Summarizing these descriptives, we see that the social structure of the marriage cohorts varies considerably. Therefore, we might find a number of compositional effects that explain differences in cohort-specific divorce rates.

Table 2. Women's educational attainment level by marriage cohort (in per cent)

Marriage cohort	Low	Medium	High	N
1936–1945	74.6	20.5	4.9	507
1946–1955	79.0	16.0	5.0	457
1956–1965	77.4	18.2	4.5	402
1966–1975	74.5	17.7	7.7	491
1976–1985	53.0	31.6	15.4	583
1986–2005	27.6	43.5	29.0	794
Total	60.1	26.8	13.1	3,234

Source: GLHS.

Figure 1 shows survival curves by marriage cohort. There is a clear cohort effect, i.e. younger marriage cohorts tend to have higher divorce rates, but the effect does not hold for every single cohort. For instance, the oldest marriage cohort (1936–1945) is clearly not the cohort with the lowest divorce rate. Instead, couples of the two subsequent cohorts (1946–1955 and 1956–1965) have the highest likelihood to stay together for 20 years of marriage. A similar pattern can be found for the youngest cohorts. The second youngest cohort (1976–1985) shows the highest risk of getting divorced. These cohort differences are in line with the official divorce statistics (Appendix Figure A1). From marriage cohort 1966 to 1985, there seems to be a continuous increase of the divorce rate. However, the divorce rates of the marriage cohort 1986 are remarkably low for the first five marriage years.

Hypothesis *H1* argues that divorce rates increase because of decreasing investments into the marriage. We already saw that marital investments indeed decreased across marriage cohorts (Table 1). The proportion of people with children declines over marriage cohorts

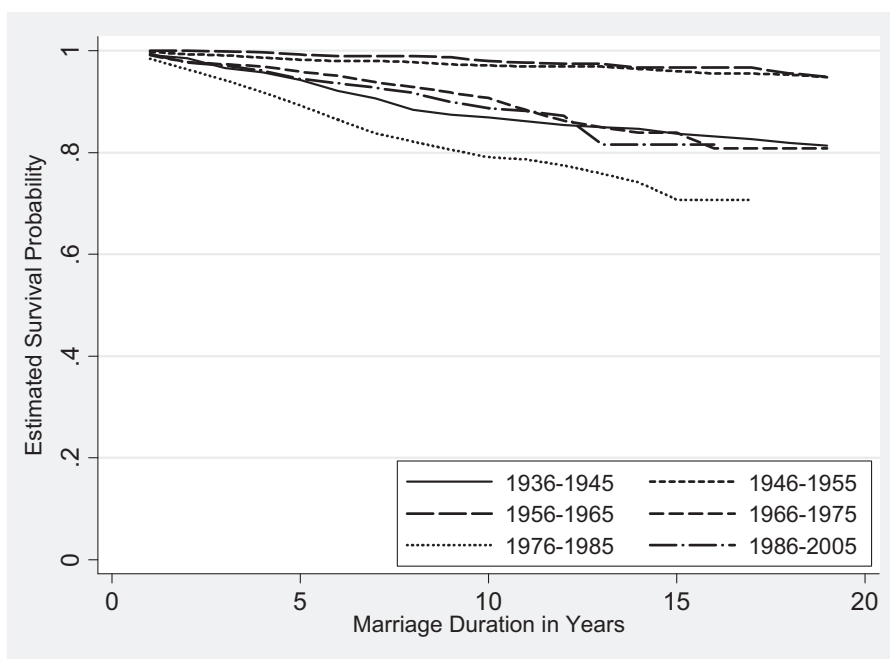


Figure 1. Proportion of non-disrupted marriages by marriage duration and marriage cohort. *Source:* GLHS

from 95 to 79 per cent which is in line with official statistical data. Ninety-six per cent of all couples with at least one child stay married after 5 years; after 10 years 91 per cent do so. In contrast, only 90 per cent of couples without children stay married after 5 years, after 10 years only 80 per cent are still at risk to get divorced (Figure not shown). The pattern of homeownership across marriage cohorts is less striking, but there is also some decrease. Divorce rates of homeowners are much lower than of tenants (Appendix Figure A2). On the basis of these results it can be supposed that the subsequent multivariate analyses may find out compositional effects.

According to transmission hypothesis *H2* we expect a compositional effect of parental divorce. As data on parental divorce are not available for all GLHS waves (see above) we had to merge the six single marriage cohorts into two broader marriage cohorts. Figure 2 demonstrates that parental divorce strongly affects the divorce risk of the younger generation ($\chi^2(1) = 21.18$, $p < 0.001$). However, the effect of parental divorce slightly decreases between the marriage cohort 1936–1975 and 1976–2005.

Hypothesis *H3* argues that an increasing proportion of employed women results in an increase of divorce rates and *H4* states that the effects of the educational

and the employment status decrease across cohorts. The associations between women's employment status and the likelihood of divorce by marriage cohort are shown in Figure 3. We observe nearly no difference in divorce rates between never-employed women and ever-employed women of the three older marriage cohorts. But never-employed women who married after 1966 experience a higher divorce risk compared to the employed women. This finding is in contrast to hypothesis *H4*.

An examination of the educational differences in the likelihood of a divorce across cohorts (Figure 4) does not provide a clear trend pattern. Married women with a medium educational level experience the lowest divorce risk in the youngest cohort and the highest divorce risk in cohort 1956–1965. But in general divorce rates do not seem to differ much between educational levels. Hypothesis *H4* states that the educational level and the employment status lose their statistical power to affect the divorce rate. This is not in line with the descriptive results we have so far.

According to hypothesis *H5* we expect a decreasing divorce risk as age at marriage increases. This is confirmed by the data (Figure not shown, see Table 3). Finally, we look at the effects of religious affiliation on the divorce rate. We clearly see women with no religious

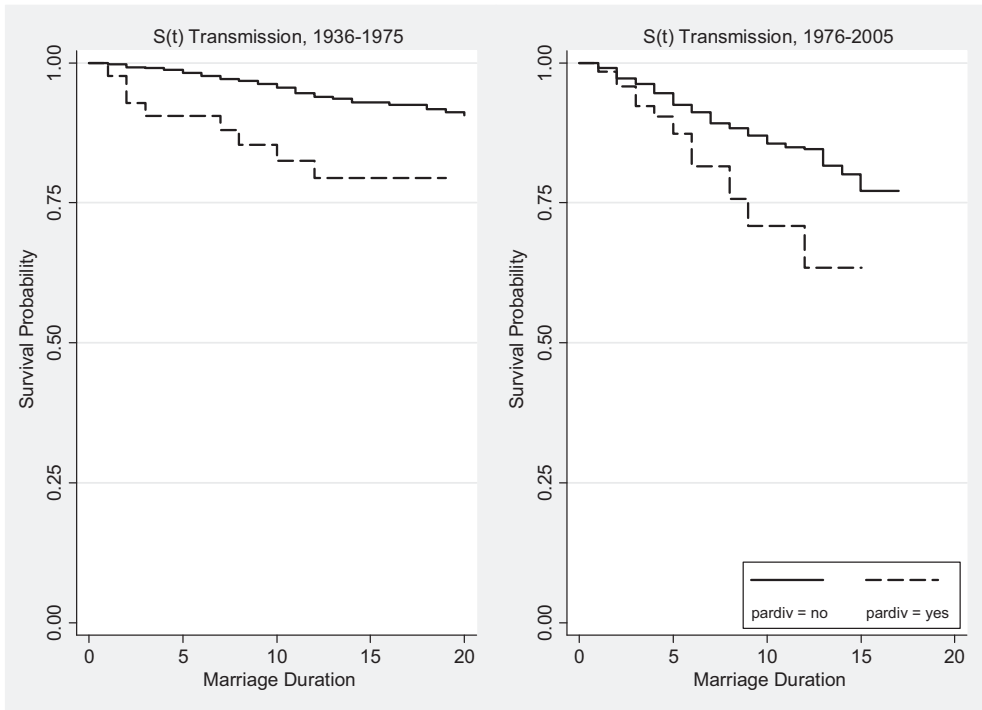


Figure 2. Proportion of non-disrupted marriages by parental divorce and two marriage cohorts. Source: GLHS

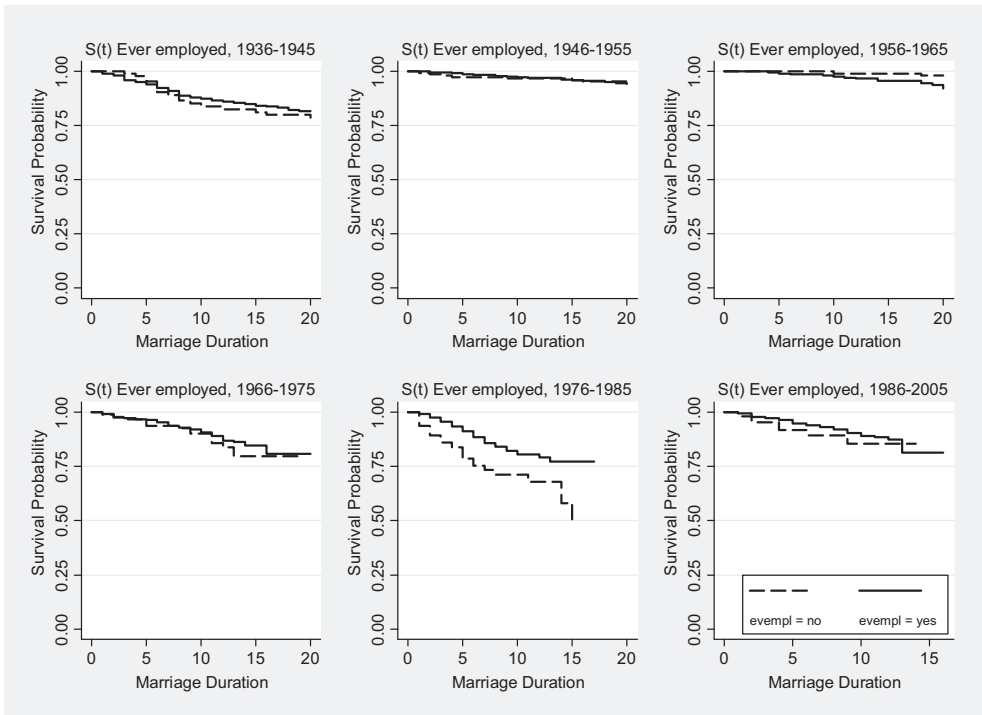


Figure 3. Proportion of non-disrupted marriages by women's employment and marriage cohort. Source: GLHS

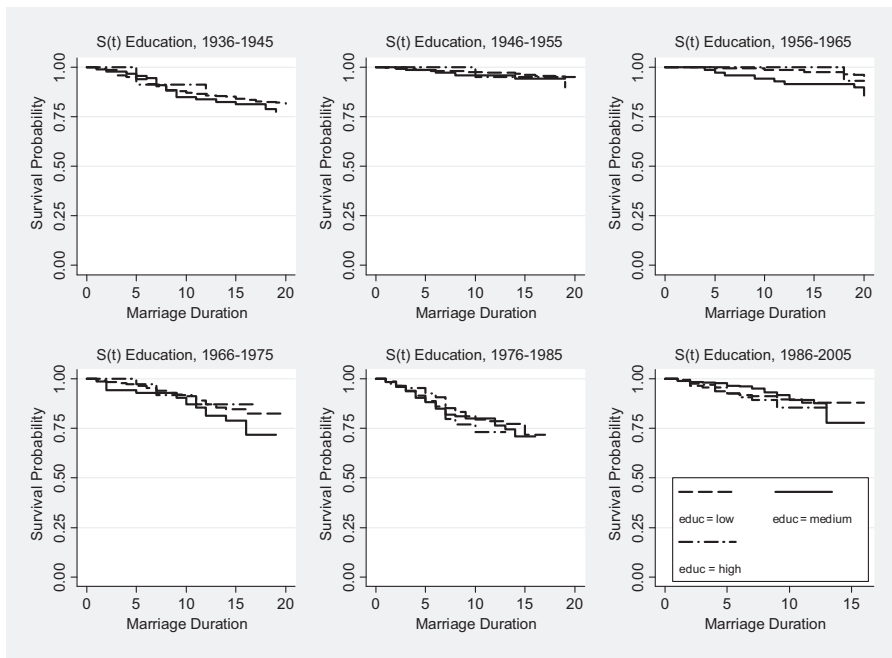


Figure 4. Proportion of non-disrupted marriages by women’s education and marriage cohort. Source: GLHS

Table 3. Average marginal effects (AME) for the transition to divorce

	Cohort model		Full model	
	AME	SE	AME	SE
Marriage duration	-0.001***	<0.0005	-0.001***	<0.0005
log (Marriage duration)	0.003***	0.001	0.005***	0.001
Marriage cohort				
1936-1945	Reference		Reference	
1946-1955	-0.005***	0.001	-0.004***	0.001
1956-1965	-0.006***	0.001	-0.005***	0.001
1966-1975	0.001	0.002	0.001	0.002
1976-1985	0.011***	0.002	0.008***	0.002
1986-2005	0.002	0.002	-0.001	0.001
Homeowner (no)			Reference	
Homeowner (yes)			-0.009***	0.001
Child ^a			-0.001	0.001
Education (low)			Reference	
Education (middle)			0.002*	0.001
Education (high)			0.004*	0.002
Women’s employment ^a			0.004***	0.001
Age at marriage			-0.000*	<0.0005
Without religious affiliation (no)			Reference	
Without religious affiliation (yes)			0.003*	0.001
N (person-years)	50,896		50,896	
AIC	4411.5		4230.3	
BIC	4482.2		4362.8	
Deviance	4395.5		4200.3	

*P < 0.05; ***P < 0.001.

^aTime-dependent predictor.

Source: GLHS.

Table 4. Average marginal effects for the transition to divorce to identify compositional effects of single predictors

Marriage cohort	Cohort model (C)	C + Homeowner	C + Child ^a
1946–1955	–0.005*** (–0.007, –0.003)	–0.005*** (–0.007, –0.003)	–0.006*** (–0.008, –0.003)
1956–1965	–0.006*** (–0.008, –0.003)	–0.005*** (–0.007, –0.003)	–0.006*** (–0.008, –0.004)
1966–1975	0.001 (–0.002, 0.004)	0.002 (–0.001, 0.005)	0.001 (–0.002, 0.004)
1976–1985	0.011*** (0.006, 0.015)	0.011*** (0.007, 0.016)	0.010*** (0.006, 0.015)
1986–2005	0.002 (–0.002, 0.005)	0.001 (–0.002, 0.004)	0.001 (–0.002, 0.005)
Predictor (yes)	–	–0.009*** (–0.011, –0.007)	–0.004*** (–0.006, –0.002)
N (person-years)	50,896	50,896	50,896
Deviance	4395.5	4263.8	4382.1
LRT	–	131.7***	13.4***

Marriage cohort	C + Employment ^a	C + Age at marriage	C + Without religious affiliation
1946–1955	–0.006*** (–0.008, –0.004)	–0.005*** (–0.007, –0.003)	–0.005*** (–0.007, –0.003)
1956–1965	–0.006*** (–0.008, –0.004)	–0.005*** (–0.007, –0.003)	–0.006*** (–0.008, –0.003)
1966–1975	<0.0005 (–0.003, 0.004)	0.001 (–0.002, 0.004)	0.001 (–0.002, 0.004)
1976–1985	0.009*** (0.005, 0.014)	0.011*** (0.006, 0.015)	0.010*** (0.006, 0.014)
1986–2005	<0.0005 (–0.003, 0.004)	0.002 (–0.001, 0.006)	0.001 (–0.002, 0.004)
Predictor (yes)	0.006*** (0.003, 0.006)	–0.000 (–0.000, 0.000)	0.007*** (0.003, 0.010)
N (person-years)	50,896	50,896	50,896
Deviance	4360.6	4392.6	4376.4
LRT	34.9***	2.9*	19.1***

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

^aTime-dependent predictor.

Note. In all models we also controlled for marriage duration, 95 per cent confidence intervals in parentheses.

Source: GLHS.

affiliation are more likely to divorce than women who are religiously affiliated (Figure not shown, see Table 3). Therefore, an increasing proportion of women without religious affiliation may result in an increase of divorce rates (H6).

Multivariate Findings

For a more detailed test of the hypotheses that stated compositional effects and behavioral changes, we will present results of stepwise regression models. We start with a model that includes cohort and all predictor variables. In a second step we investigate compositional effects of single predictor variables. In a third step behavioral changes are analyzed by an estimation of interaction effects of marriage cohort and a predictor variable.

Table 3 provides the results of two models. The first model includes duration effects and cohort variables and the second model includes all predictor variables. The divorce rates of the marriage cohort 1946–1955 and 1956–1965 are lower than the divorce rates of the marriage cohort 1936–1945. Divorce rates strongly increase with the marriage cohort 1976–1985, whereas divorce rates of the marriage cohorts 1966–1975 and 1986–2005 are slightly lower (Appendix Figure A3).

Nearly all of our predictor variables are significantly associated with the risk of divorce: Homeownership strongly increases marital stability, whereas the educational level, women's employment and a missing religious affiliation decrease marital stability. Children and age at marriage show no or very small effects on marital stability (Table 3). Instead, the transmission effect can be clearly identified (Appendix Table A2). If all predictor variables are added to the model, most of the cohort effects are slightly decreasing. The whole set of predictor variables accounts only partly for marriage cohort effects. Therefore, any of our hypotheses about compositional effects is only of limited power to explain the change of divorce rates.

A closer inspection of compositional effects that are due to the influence of each of the predictor variables is provided in Table 4. Except age at marriage, all predictors have an effect on divorce risk. Homeownership and children decrease the divorce risk, while parental divorce (Appendix Table A2), women's employment, and the absence of religious affiliation destabilize the marriage. Women's employment and the absence of a religious affiliation reduce the cohort effect (e.g. for marriage cohort 1976–1985 this reduction is 18 per cent in case of women's employment), but the 95 per cent

Table 5. Log odds ratios for the transition to divorce: interaction effects to identify behavioral change with marriage cohort as a categorical variable

Marriage cohort (C)	Interaction marriage cohort and women's education (educ)		Interaction marriage cohort and women's employment
	C × educ (middle)	C × educ (high)	C × employment
1946–1955	0.338	1.254**	0.180
1956–1965	0.717	0.584	0.437
1966–1975	0.118	−0.334	−0.151
1976–1985	−0.147	−0.080	−0.432
1985–2005	−0.406	0.017	0.923**
N (person-years)		50,896	50,896
LRT		11.8	16.2*

* $P < 0.05$, ** $P < 0.01$.

Note. Controlled for marriage duration; models also include the main effects of the predictor variables. LRT: the reduced model is the cohort model in Table 3 plus the main effect of the predictor variable.

Source: GLHS.

confidence intervals (and the 90 per cent confidence intervals; results not shown) of the cohort model and the cohort model plus the predictors variables still overlap. We see again that no single predictor is able to reduce the cohort effects in a substantial way or to reduce the cohort effects to an insignificant level. We cannot completely rule out that compositional effects of the predictor variables we use are driving divorce rates. But these effects are likely to be small. To ensure these results we tested whether the regression coefficients differ significantly by applying the KHB-method (see above). The results are similar: Also these tests revealed that cohort effects are not substantially reduced by any of the predictor variables.

A closer inspection of behavioral changes according to hypothesis *H4* is provided by Figures A4 and A5 in the Appendix. These figures show the interaction of marriage cohort and the predictor variables educational attainment and women's employment during the marriage. While the interaction coefficient of the marriage cohort 1946–1955 and high education have a significant positive effect on divorce risk (Table 5), Appendix Figure A4 shows no pattern of the educational level on the divorce risk of cohorts. For women's employment, we observe a significant positive effect of employment for the youngest cohort (Table 5 and Appendix Figure A5). However, the pattern we assumed in *H4*—that the effect of women's employment decreases over cohorts—is not visible.

Discussion

The aim of the paper was to test some hypotheses about the determinants of the historical trends in divorce rates. We investigated trends of marital instability in

West-Germany by means of an analysis of marriage cohorts. Hypotheses were derived by linking the parameters of three theoretical micro models—the exchange, the investment, and the microeconomic model that explain marital stability—to four social processes: factors that foster self-reinforcing processes, the transmission of divorce risks across generations, changing gender roles, and the deinstitutionalization of marriage. This analysis concentrated on the identification of compositional effects and of effects that are due to changes of marital or divorce behavior.

We assumed that a decrease in marital investments could be a driving force resulting in an increase of divorce rates. Indeed, we found that the proportion of childless marriages increased. A similar trend could be observed for homeownership which is another type of marital investment, but rates of homeownership did not decrease continuously across cohorts. Nevertheless, the important point is that a decrease of these marital investments could not explain the rise of divorce rates.

The intergenerational transmission of divorce risks describes an important mechanism for the explanation of marital stability. In addition, we found that the prevalence of children of divorce among the married women increased from cohort to cohort. But this did not result in significant compositional effects.

The historical change of gender roles is one of the prominent explanations of the rise of divorce rates. We examined the role of women's educational level and employment status. Controlling for all covariates, the educational level positively affected the divorce rate, whereas women's employment had no significant effect. A closer inspection of the effects did not result in a

confirmation of the compositional hypothesis. However, there are findings that point to significant interaction effects between the year of marriage and the educational level or the employment variables. The effect of both predictor variables seems to decrease across marriage cohorts, which is in line with our hypothesis. But this finding is not stable as it depends on whether the marriage cohort is considered as a categorical variable or not.

One indicator of the deinstitutionalization of marriage is the increase in the age of marriage. Again, we found that a higher age at marriage results in more stability of marriages, but age at marriage did not contribute much to explain different divorce rates of marriage cohorts. Also the increase of the proportion of the married without a religious affiliation could not account for the upward trend in divorce rates.

Compositional effects or effects due to behavioral changes are very weak, and as they are not significant they are in no way sufficient to explain the increase of divorce rates across marriage cohorts. Possible reasons are a small sample size and inadequate measurements. One cannot rule out that a larger sample of marriage cohorts and the full inclusion of the latest marriage cohorts would allow a deeper investigation of the historical trend and a more differentiated analysis of subgroups. It would also be desirable to empirically capture the deinstitutionalization of the marriage in a more comprehensive way. Especially, the inclusion of values and norms that regulate marital and non-marital partnerships on the one side and individual orientations towards the meaning of partnership on the other would be promising.

The main contribution of this study is the robust empirical finding that we cannot explain the historical increase of divorce rates in Germany by compositional or behavioral changes of established socio-structural divorce risks. This is in line with the findings from previous studies. We can only speculate about alternative explanations. On the basis of the methods applied here, we were not able to pinpoint the influence of macro variables on divorce rates in a conclusive way. Modeling the influence of macro-micro effects is a precondition to identify self-reinforcing processes which result from changes in the opportunity structure to dissolve a marriage. This opportunity structure is related to the availability of alternative partners, which changes across historical time as a consequence of changing divorce rates. A promising task for future research would be to identify these self-reinforcing processes. Moreover, one could think of more cultural explanations of divorce trends. Cultural trends, e.g. reflected in an increase of

individualistic values and opinions and a decrease in the strength of traditional marriage norms, might promote more partnership conflicts, a decrease in marital quality, and less commitment to marriage as an institution. Because there is a lack of data sets that not only cover a long historical time span but also include individual values and opinions in a way that allows their appropriate inclusion into models of divorce risks, partnership interaction remains a black box. The modeling of links between macro variables and socio-structural variables on the one hand and patterns of marital interaction and quality on the other is another task for future research.

Note

- 1 Flanders, Finland, France, Hungary, Italy, Lithuania, Poland, Sweden, United States.

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Appendix

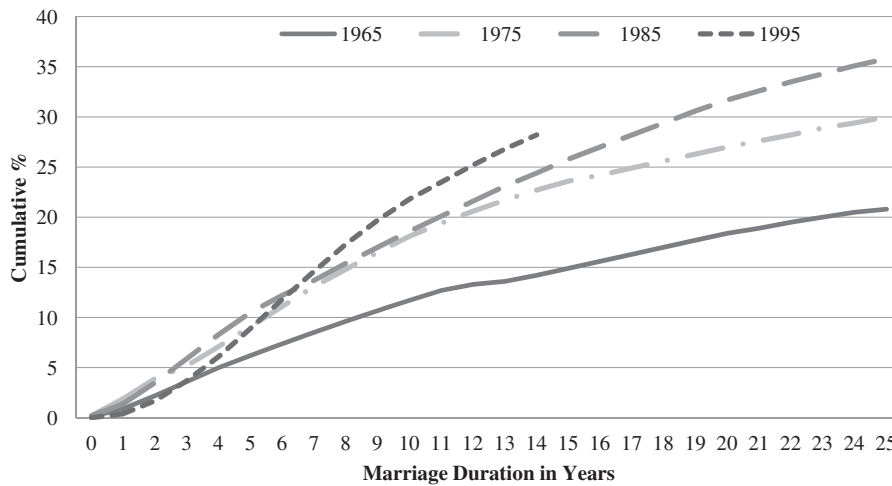


Figure A1. Proportion of divorced marriages of marriage cohorts 1965, 1975, 1985, and 1995 by marriage duration in Germany (Source: Federal Institute for Population Research)

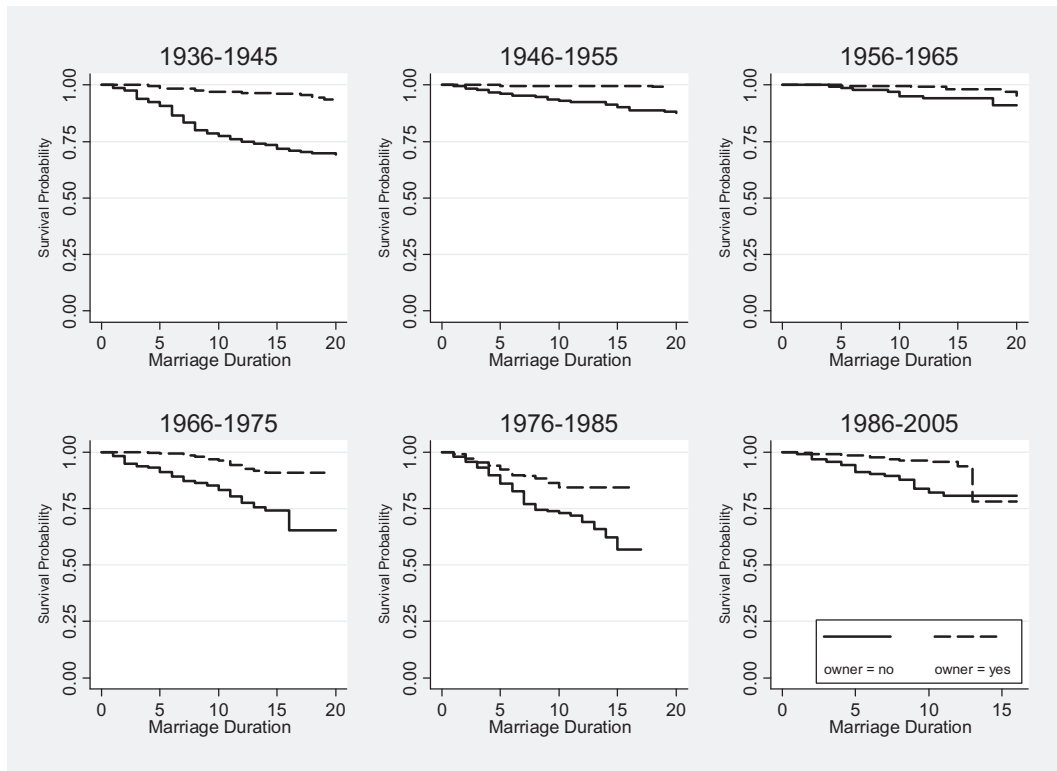


Figure A2. Proportion of non-disrupted marriages by homeownership and marriage cohort (Source: GLHS)

Table A1. Descriptive statistics (women)

	N	Mean	Std. Dev.	Min	Max
Divorce or separation	3,234	0.12	0.33	0	1
Duration of marriage (year)	3,234	15.74	12.27	1	51
Age at marriage	3,234	23.29	4.38	15	58
Educ. level: low	3,234	0.60	0.49	0	1
Educ. level: medium	3,234	0.27	0.44	0	1
Educ. level: high	3,234	0.13	0.34	0	1
Ever employed	3,234	0.78	0.41	0	1
Child	3,234	0.87	0.34	0	1
Parents' divorce	2,465	0.07	0.25	0	1
Homeowner	3,234	0.52	0.50	0	1
Without religious affiliation	3,234	0.09	0.29	0	1

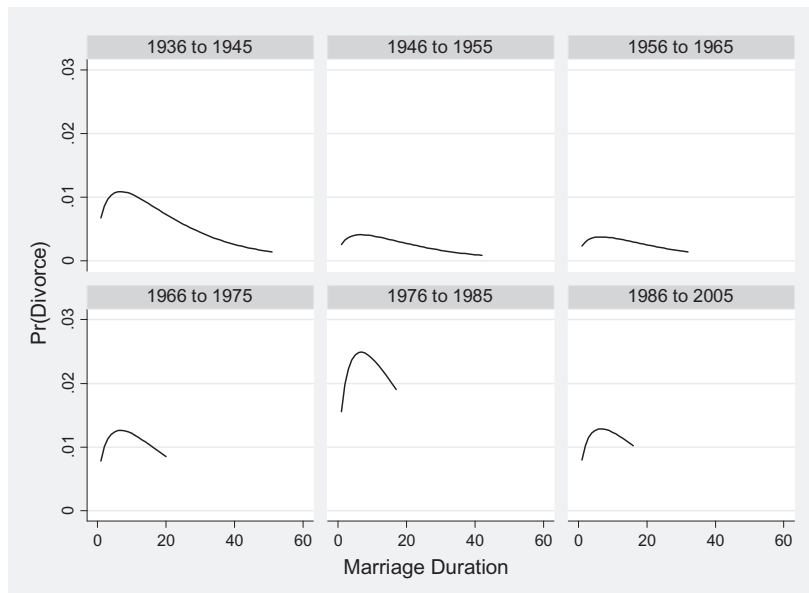
Source: GLHS.

Table A2. Average marginal effects (AME) for the transmission effect (models are based on a subsample of valid cases for parental divorce)

	Cohort model		Full model		Parental divorce model		Parental divorce × cohort model (log-odds ratios)	
	AME	SE	AME	SE	AME	SE	AME	SE
Marriage duration	−0.000*	<0.0005	−0.001*	<0.0005	−0.000	<0.0005	−.051*	0.026
log (Marriage duration)	0.003**	0.002	0.005***	0.002	0.003**	0.002	0.398***	0.173
Marriage cohort								
1936 to 1975	Reference		Reference		Reference		Reference	
1976 to 2005	0.011***	0.002	0.008***	0.001	0.011***	0.002	1.138***	0.151
Homeowner (no)			Reference					
Homeowner (yes)			−0.009***	0.001				
Child ^a			−0.003*	0.001				
Education (low)			Reference					
Education (middle)			0.002	0.001				
Education (high)			0.004	0.002				
Women's employment ^a			0.005***	0.001				
Age at marriage			−0.001***	<0.0005				
Without religious affiliation (no)			Reference					
Without religious affiliation (yes)			0.003	0.002				
Parental divorce (no)			Reference		Reference		Reference	
Parental divorce (yes)			0.006*	0.003	0.010***	0.003	0.943**	0.371
Parental divorce × marriage cohort							−0.15	0.426
N (person-years)	29,943		29,943		29,943		29,943	
AIC	2,952.042		2,819.952		2,937.136		2,939.016	
BIC	2,985.27		2,919.637		2,978.672		2,988.858	
Deviance	2,944.042		2,795.952		2,927.136		2,927.016	

* $P < .05$; ** $P < .01$; *** $P < .001$.^aTime-dependent predictor.

Source: GLHS.

**Figure A3.** Hazard rate of divorce (marriage duration in years) by marriage cohorts (based on the 'cohort model' in Table 3) (Source: GLHS)

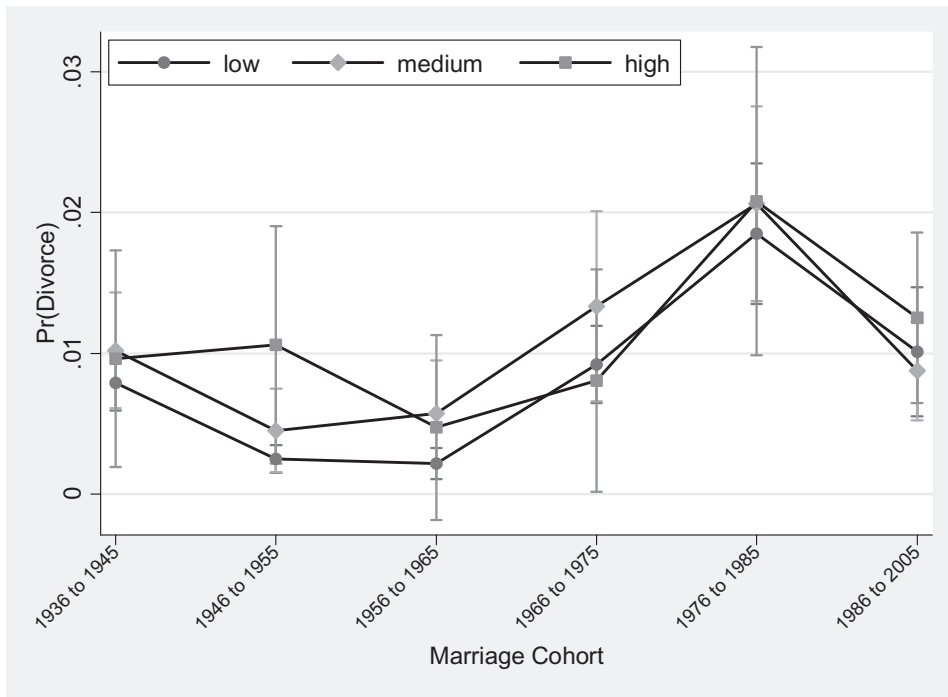


Figure A4. Predicted probabilities of divorce and 95% confidence intervals by marriage cohort and educational attainment (Source: GLHS)

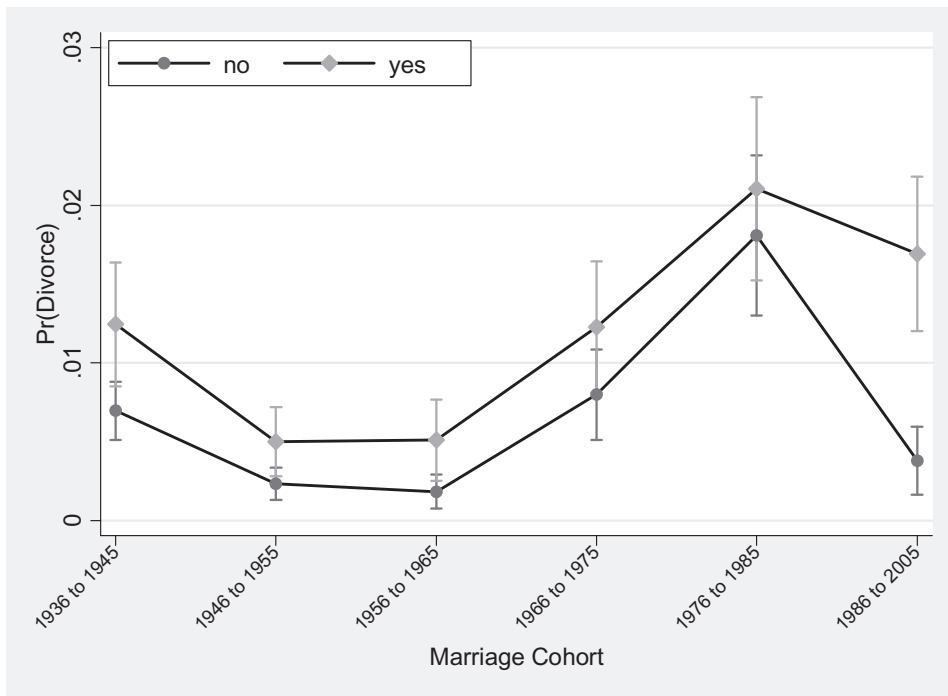


Figure A5. Predicted probabilities of divorce and 95% confidence intervals by marriage cohort and women's employment (time-dependent) (Source: GLHS)