

Premarital Cohabitation and Marital Stability in West Germany*

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Summary

This paper investigates whether premarital cohabitation affects the likelihood of divorce in a subsequent marriage. The well-known “trial marriage“ hypothesis postulates that cohabitation should decrease the divorce rate because high-risk partners will separate before marrying. We use data from the West German Family Survey from 1988 to test this hypothesis. We find – contrary to the trial marriage hypothesis – that cohabitation increases the risk of a subsequent marriage ending in divorce. However, more sophisticated analyses indicate that this result is due to self-selection: High-risk persons sort themselves into cohabitation. Using a bivariate probit model, we can show that cohabitation – net of self-selection – actually decreases the risk of divorce.

KEY WORDS: Cohabitation, Divorce, Self-Selection, Family Economics

A change in marriage behavior that parallels the rise in divorce rates has occurred in most Western industrial nations. While it was still the exception at the beginning of the 1970s for potential marriage partners to found a joint household before marriage, premarital cohabitation has become the rule today in many countries (Blossfeld 1995: 20). In Germany, for instance, less than 10 percent of couples lived together before marriage prior to 1970. In contrast, more than one in two couples from the more recent marriage cohorts lived together before marrying (Kopp 1994: 64).

How does premarital cohabitation affect marital stability? The widely accepted thesis is that cohabitation increases the stability of a subsequent marriage because it is an institution that provides the opportunity of putting the maxim “Look before you leap!” into action. In this sense, cohabitation is a trial marriage. Yet this trial marriage hypothesis regularly fails to find confirmation in empirical studies. Various studies have shown that couples who cohabited before marriage show a higher risk of divorce. This startling result has stimulated many studies. Meanwhile, there seems to be consensus that self-selection produces this result: cohabiting couples are distinct from non-cohabiting ones in many characteristics that influence marriage stability. It is not the trial marriage that is responsible for the increased risk of divorce; these couples would have a higher risk of divorce anyway. To identify the “true” impact of cohabitation, one must control for self-selection by means of suitable statistical methods.

This study addresses this task using German data. We use the German Family Survey from 1988 to determine whether cohabitation, net of self-selection, actually increases or decreases the risk of divorce. By using bivariate and multivariate event history methods, we investigate the effect of cohabitation on the divorce rate. Next, we apply several indirect tests of the trial marriage and self-selection arguments. Finally, we propose a simultaneous cohabitation-divorce model which controls statistically for self-selection.

Cohabitation and the Risk of Divorce

Theory

The widely accepted trial marriage hypothesis maintains that premarital cohabitation reduces the risk of divorce because the partners can test if they are compatible. This mechanism can be described more precisely with the help of arguments from family economics (Becker et al. 1977;

Becker 1991). Reliable information on a partner can only be gained for manifest characteristics such as education and appearance. These are called “search traits.” On the other hand, information on experience traits such as psychological characteristics remains incomplete. The lack of such information and the “mismatches” inherent from it are the primary cause for divorce, according to family economics. An empirical confirmation for this is the observation that most divorces occur in the first few years after marriage, when information on experience traits is revealed (e.g., Fisher 1993). Given these arguments, better information on experience traits should sharply reduce the risk of divorce.

Yet precisely this information is available through cohabitation. By actually living the match, information on experience traits is revealed. For some matches this information will be negative, that is, at least one partner dislikes some of the traits now known to him. Therefore, the probability is high that “mismatches” can be detected and terminated before marriage (empirical details of this “weeding out” process are provided by Vaskovics und Rupp 1995). The trial marriage functions as a filter, so to speak, which separates “compatible” relationships from “incompatible” ones. That this happens very often in practice is indicated by studies showing that the separation rate of cohabiting partners is much higher than that of married partners (Teachman et al. 1991; Hoem und Hoem 1992). Accordingly, one would expect premarital cohabitation to reduce the risk of divorce in a subsequent marriage.

Empirical Studies

However, empirical studies provide an entirely different picture. The available studies unanimously agree that marriages with a prior history of cohabitation show a higher risk of divorce than those in which the partners did not live together before marriage (for the USA: Bumpass und Sweet 1989; Teachman und Polonko 1990; for Canada: Balakrishnan et al. 1987; Trussel und Rao 1989; Hall und Zhao 1995; for Australia: Bracher et al 1993; for Sweden: Bennett et al. 1988; Trussel et al. 1992; for Germany: Hall 1997; Gostomski et al. 1998). Thus, the trial marriage hypothesis would appear to be refuted.

Given these results, several arguments have been offered to explain why cohabitation increases the divorce rate. Two main arguments can be found in the literature: (i) Marital partners who have cohabited before marrying have learnt from this experience that there are alternatives to

marriage. This has the consequence that the minimum level of marital quality they are willing to accept is higher. This increases the probability that a marriage will be terminated (e.g., Booth und Johnson 1988). (ii) The experience of cohabitation makes people more unconventional and this reduces the stability of a subsequent marriage (Bennett et al. 1988; Axinn and Thornton 1992). Both of these arguments interpret the divorce rate increasing effect of cohabitation as a causal effect: Cohabitation *makes* people more divorce prone.

Self-Selection

Yet does the evidence cited above really show that there is a causal cohabitation effect? This cannot be concluded firmly because the problem of self-selection arises here, as with many other comparisons based on non-experimental data. Cohabitors may differ already *before* starting a cohabitation from those who pursue the traditional marriage pattern. They might show less commitment towards partnerships (Bennett et al. 1988), they might have more „unconventional“ attitudes, and they might more often show a deviant lifestyle (Booth and Johnson 1988). Empirical evidence that cohabiting partners are less marriage-oriented or have more unconventional attitudes was found in cross-sectional studies (Thomson und Collela 1992; DeMaris und MacDonald 1993) as well as in panel studies (Rindfuss und Van den Heuvel 1990; Axinn und Thornton 1992; Cunningham und Antill 1994; Clarkberg et al. 1995). If these traits increase the risk of divorce, the observed proneness to divorce displayed by cohabitors might be spurious.

Therefore, in order to isolate the true causal effect of a cohabitation, it is necessary to control for these traits. However, this analytical strategy is not viable for the most part because standard surveys usually do not include appropriate measurements for these traits. This is the reason why all the studies cited above find a higher risk of divorce for prior cohabitors, even after controlling for standard socio-demographic variables. This is also true of our data, as we will demonstrate below. Given the fact that we, like other authors, do not have data with appropriate measurements of the traits by which cohabitors select themselves, the question arises, how would it nevertheless be possible to identify the true causal effect of cohabitation. In the literature, two strategies have been proposed:

1) *Indirect Tests*. With this strategy, the original trial marriage and self-selection hypothesis is

supplemented with additional assumptions. Implications are then derived which can be empirically tested (good examples for this strategy can be found in Bennett et al. 1988). For instance, a plausible assumption would be that those who experienced more than one cohabitation before marriage, are an even more self-selected group. For this group, we would therefore expect a very high divorce rate. This implication can be tested with our data. If we find an empirical pattern as predicted, our confidence in the trial marriage and/or self-selection hypotheses increases. We call this strategy “indirect” because we are not testing these hypotheses directly; only the implications derived with the help of additional assumptions are being tested. Below, we derive several of these indirect tests.

2) *Simultaneous Models*. A second strategy reformulates the self-selection problem as a simultaneous equation model (Kahn und London 1991; Lillard et al. 1995). Figure 1 gives a graphical representation of this argument. Some covariates (marriage cohort, etc.) influence the probabilities of cohabitation and also divorce. The probability of divorce depends on additional variables (e.g., marriage age, birth of a child) and – central to our argument – possibly on cohabitation. The γ parameter informs us about the cohabitation effect. Further, both probabilities are affected by several unobservables. Self-selection now has the consequence that these unobservables are correlated (symbolized by ρ). For instance, we argue above that unmeasured attitudes towards marriage might influence the probability of both cohabitation and divorce. Therefore, the error terms of the two equations are correlated. If we estimate a single divorce equation – the standard approach – this has the consequence that the estimate of γ is biased because the cohabitation dummy is correlated with the error term. Only a simultaneous equation model that allows for correlated error terms overcomes this bias. Such a statistical model is therefore able to identify the unbiased effect of cohabitation on the probability of divorce. Below we will describe and use such a model.

[Figure 1 here]

Both strategies use additional assumptions that cannot be tested. This is obvious for the indirect tests. However, the simultaneous equation approach also relies on many assumptions concerning the correct specification of the model. Therefore, both strategies would lead us to incorrect conclusions if these assumptions are empirically invalid. For this reason, we will not rely on a

single test of this type in this paper. Instead, we will use several such tests. The general argument will be that our confidence in the results will be high, if all these tests provide concordant answers.

Data and Methods

This study is based on the West German Family Survey from 1988 which was administered by the German Youth Institute (DJI). The DJI study is a random sample of the total West German residential population between the ages of 18 and 55 living in private households. 10,043 people participated in a personal interview in which detailed information on their partnership history was collected. Although the response rate was relatively low (52%), comparisons of the distributions of the socio-demographic variables with official statistics show that deviations are no greater than in other national surveys. Women, married persons, and persons not in the labor force are somewhat oversampled, while type of family and household type correspond well with official statistics (Bender et al. 1996). The data are available under code ZA-Nr. 2245 from the *Zentralarchiv* in Cologne. For the following analyses, we only consider first marriages for both spouses. There are 6,716 first marriages in the data. Some of these had missing values on either the dates of cohabitation, marriage or divorce. A total of 6,179 respondents provided all the necessary timing information.

This data set is especially well suited to our research problem. The first advantage of the Family Survey is that a relatively large number of interviews were completed. As mentioned previously, cohabitation was the exception in older cohorts. Therefore, to obtain robust estimates of the cohabitation effect for older cohorts, an adequate number of cases are necessary. This is also true for the indirect tests, some of which rely on very small populations. Secondly, with the Family Survey, very detailed partnership careers were collected. In particular, the exact timing of premarital cohabitation is important for our research question. Most other German surveys do not contain this information.

Finally, the Family Survey provides relatively detailed information on the characteristics of the respondent's spouse. In contrast to many other studies on divorce, we were therefore able to use couple-specific variables (e.g., religious and ethnic identity, age and education of the partners at start of the partnership) instead of only using variables for a single respondent alone. This is

desirable, because the basic unit of analysis in divorce studies is a marriage, not a person. In addition, this feature of the survey allows us to exclude marriages where the respondent's spouse had previously been married. Including these marriages would bias the cohabitation effect upwards, because previously married persons are more likely to enter into a premarital union and also exhibit higher divorce rates (Teachman et al. 1991).

Variables

Marriage Duration. The dependent variable in our analyses is the duration of a marriage. It is measured in years and computed from information on the timing of marriage, divorce, death of a spouse, and interview. We know only the year and month of the marriage date and the marriage day is therefore set to the 15th of the month. Dates on divorce and spouse's death are reported only to the year, so that the day and month are set as June 30. Since the exact date of the interview is not included in the data set, we set this date to October 20, 1988 (the median of field time). 12.4 percent of the marriages ended in divorce. 3.0 percent ended as a result of the death of a spouse and 84.6 percent were still intact at the time of the interview. The latter two events will be treated as censoring events.

Cohabitation. Our central independent variable is cohabitation. If a couple founded a joint household before entering marriage, the dummy variable "premarital cohabitation" equals 1, otherwise it is 0. 21.9 percent of our marriages showed a premarital cohabitation.

Control Variables. In the multivariate analyses, we use several control variables. Their expected effects on the divorce rate are described in the literature (e.g., Becker et al. 1977; White 1990) and we do not develop specific hypotheses for their effects in this paper. The means of these controls are presented in Table 1.

Three dummy variables were formed for the 1961–70, 1971–80, and 1981–88 "marriage cohorts." The reference category is the 1949–60 marriage cohort.

Place of residence is coded with two dummies (at time of interview): "village" for respondents who live in communities with less than 5,000 inhabitants, and "town" for those with 5,000–100,000 inhabitants. The reference category is cities with more than 100,000 inhabitants. Religious faith of marriage partners is coded with three dummies: both spouses Catholic ("catholic couple"), neither partner with religious affiliation ("without denomination"), couple

with mixed denominations (“mixed denomination”). The reference category embraces couples where both partners have the same denomination (Protestant and other churches).

If the couple is of mixed nationality, a dummy variable (“partner is foreigner”) is coded 1, otherwise it is 0.

“Age at start of partnership” is measured in years for both partners. We only include couples, where both partners were 14 years of age or older at the start of the union.

“Education” of the respondents and their spouses is measured by the number of years that it usually takes to obtain a qualification: still attending school: 8 years; dropped out of primary/secondary school: 8 years; primary/secondary school: 9 years; middle school/ classical secondary school completion: 10 years; trade school completion: 12 years; high school completion (*Abitur*): 13 years. For the respondent, we know the highest qualification completed at the time of interview; for the spouse, at the beginning of the partnership.

If the birth of the first child occurred before entering into marriage, the “child born before marriage” variable is equal to 1, otherwise it is 0. Only children procreated with the first marriage partner are taken into account.

“Birth of first child” is a time-varying variable that is 0 up to the time the first marital child is born, and 1 afterwards.

If the respondent has “no siblings”, the variable takes the value 1, otherwise it is 0.

Education of the respondent’s father is measured by a dummy variable that gets a 1, if the “father completed high school” (*Abitur*). A father with *Abitur* indicates a higher social origin.

The type of parental family is captured with three dummy variables: living, up to the age of 15, mainly with “no parents,” with “one parent,” or with “divorced parents.” Reference category is those who, aged 15, still lived with both parents.

“Church attendance” is coded 1 if a person attends church at least once a month, otherwise 0.

“Marital orientation” is measured by a simple additive index. The four underlying items are: “A marriage means security,” “Only if the parents are married, do the children really have a home,” “Marriage means readiness to assume responsibilities for each other,” and “If two people love one another, they should also marry.” These items were selected from a longer list by using an exploratory factor analysis. The index ranges from 0 to 12 (0 = marriage unimportant; 12 = marriage very important).

Methodological Note. We do not use marriage age, as most other studies do, but age at start of

partnership. For cohabiting couples, this is the age when they started living together, for non-cohabiting partners, it is the age at marriage. According to family economics, marriage age is an indicator for the length of mate search. The longer you search for a mate, the better will be the match. Therefore, people who marry late should have a lower divorce rate. However, for cohabiting couples, the search period ends when they start living together. For them, the marriage age would be an inappropriate indicator because, by using marriage age, we associate the effect of the years spent cohabitating with a longer search period, not with cohabitation. When using marriage age, some of the divorce-lowering effect of a cohabitation is captured by the typically negative effect of marriage age. Therefore, Cohen (1991) argued that the effect of cohabitation on divorce will be biased severely upwards if marriage age is used instead of age at start of partnership as a control. This is exactly what happens in practice. If we use marriage age instead of age at start of partnership as a control in Model 1 below, the cohabitation effect almost doubles. Therefore, future studies on cohabitation and divorce should follow Cohen's advice.

Methods

Rate Model. To analyze the effects of cohabitation and our control variables on marriage duration, we use techniques of event history analysis (e.g., Blossfeld und Rohwer 1995). These methods provide consistent parameter estimates, even when some of the data are censored, as is generally the case with divorce data. In addition, event history techniques allow the modelling of the time-dependence of the transition rate. This is important, because the divorce rate is known to vary with duration of the marriage. In Figure 2, we present estimated divorce rates for three marriage cohorts from our data. The typical sickle pattern for divorce rates is clearly recognizable (at least for the two younger cohorts): in the first year the divorce rate is low, but climbs steeply thereafter, reaching a peak in the fourth year, and then slowly receding. That the maximum risk of divorce occurs two to four years after marrying seems to be a universally valid regularity according to the results of Fisher (1993: 468), who studied divorces in 188 societies.

[Figure 2]

Therefore, to analyze the effects of covariates on the divorce rate, a model that takes into account the nonmonotonic, sickle-shaped pattern of divorce rates has to be used. Such a model

is the sickle model. It assumes the following parametric function of the divorce rate $r(t)$ (Diekmann and Mitter 1984):

$$r(t) = cte^{-t/\lambda},$$

whereby

$$c = \alpha_0 \alpha_1^{X_1} \alpha_2^{X_2} \dots \alpha_m^{X_m}.$$

X_1, \dots, X_m denote covariates while $\alpha_0, \dots, \alpha_m$ are relative risk effects to be estimated empirically. $(\alpha_k - 1) \cdot 100$ can be interpreted as the percentage effect of the covariate k on the divorce rate. If $\alpha > 1$ ($\alpha < 1$), there is a positive (negative) influence of a covariate on the risk of divorce. The parameter λ provides an estimate of the time at which a peak in the divorce rate occurs. Moreover, the model allows for “immunity,” that is, for the fact that many marriages never end in divorce. In comparison with other two-parameter models, the sickle model yields a very good fit for divorce data (Diekmann and Mitter 1984).

X_1 will be the cohabitation dummy. The trial marriage hypothesis predicts that α_1 will be less than one, that is, that cohabitation decreases the divorce rate (the cohabitation effect is negative). Contrary to this, according to the self-selection hypothesis, the estimate of α_1 might be greater than one (positive cohabitation effect). This positive effect is spurious, however. The estimate should decline if we control for traits by which cohabitators self-select. If our measures of these traits are valid, the estimate of α_1 should eventually become less than one.

In the presence of censored observations, the maximum likelihood method provides consistent and asymptotically normally distributed estimates for the parameters. To estimate the effects of covariates that vary with marriage duration, we use the technique of episode splitting. The program Transition Data Analysis (TDA) written by Götz Rohwer is employed to obtain the ML estimates (cf. Blossfeld and Rohwer 1995).

Bivariate Probit Model. Two strategies have been proposed to estimate the simultaneous equation model depicted in Figure 1. Lillard proposes a simultaneous transition rate model (Lillard 1993; Lillard et al. 1995). Holm-Larsen and Rohwer (1993) discuss a similar transition

rate model with correction for selectivity. However, these models have not yet been tested sufficiently regarding robustness and convergence characteristics. Our own experience with such models is that they do not converge, given reasonable convergence criteria. Therefore, we do not use such models in this paper.

Kahn and London (1991) dealt with a similar self-selection problem: the effect of premarital sexual activity on divorce. They proposed estimating the simultaneous equations on the probabilities of premarital sex and divorce via a bivariate probit model. In this paper we will follow their suggestion and use the bivariate probit model to estimate the parameters in Figure 1. The formulae for this model are:

$$\begin{aligned}
 c_i^* &= \beta_1' x_{1i} + \varepsilon_{1i}, \\
 d_i^* &= \beta_2' x_{2i} + \gamma c_i + \varepsilon_{2i}, \\
 c_i &= 1, \text{ if } c_i^* > 0, \quad c_i = 0, \text{ otherwise,} \\
 d_i &= 1, \text{ if } d_i^* > 0, \quad d_i = 0, \text{ otherwise.}
 \end{aligned}$$

c_i^* and d_i^* symbolize the latent variables “cohabitation tendency” and “divorce tendency”. c_i and d_i are the observable and dichotomous “cohabitation” and “divorce” indicators for a person i . \mathbf{x}_1 and \mathbf{x}_2 are vectors of covariates, β_1 and β_2 are vectors of coefficients, and $\varepsilon_1, \varepsilon_2$ are bivariate normally distributed error terms with mean 0, variance 1, and correlation ρ . We are primarily interested in the cohabitation effect γ . This will be biased, however, if we assume $\rho = 0$ as in the univariate model. This bias will be removed by allowing for $\rho \neq 0$. Thus, the bivariate probit model provides a solution for the self-selection problem.

We obtain the ML-estimates for this model by using LIMDEP (Greene 1995). To make interpretation easier, the probit parameter estimates were transformed to “marginal effects.” For instance, the effect of X_j on the probability of cohabitation is computed by the following formula (evaluated at the mean value of the covariate vector):

$$\frac{\partial P(c = 1)}{\partial X_j} = b_j f(b' \bar{x})$$

Marginal effects indicate approximately by how many percentage points the cohabitation probability changes if the independent variable increases by a unit.

Note that, by using the bivariate probit model, we have departed from the event history framework used above. There, we were using information on the exact timing of divorce; here, a dichotomous divorce indicator. This indicator should not be derived from the answer to the question “Was a divorce ever observed?” but from “Was a divorce observed after t years?” For our analyses, we defined t as being equal to 7. That is, 1 means that a marriage was divorced within its first 7 years, a 0, that it lasted at least 7 years. Consequently, we had to restrict our sample to the marriage cohorts 1949–80. We also had to exclude widowed persons, whose marriage did not last at least 7 years. This left us with 4,830 marriages of which 13.9 percent cohabited and 5.7 percent ended in divorce after 7 years.

Empirical Results

Bivariate Analysis

Firstly, we will consider a simple bivariate comparison of survivor functions for marriages with and without previous cohabitation. Figure 3 plots these survivor functions. To control for the increasing incidence of cohabitation over time we only look at the 1971–1988 marriage cohorts (otherwise the younger cohorts with higher divorce rate would be over-represented amongst cohabitators). It is clear that the two types of marriages differ significantly: Marriages with cohabitation prior to the wedding are less stable than those without previous trial marriages. After 10 years, the proportions of those having divorced amount to 15 and 10 percent respectively. This is also confirmed by an application of the parametric sickle model to our data (Table 1, Model 0). Compared to marriages without cohabitation, the divorce rate of marriages with premarital cohabitation is higher by a factor of 2.28. Thus, the bivariate analyses show the astounding, yet well-known result that previously cohabiting partners have a higher risk of divorce.

[Figure 3 here]

Controlling for Self-Selection

As argued with the self-selection hypothesis, the bivariate cohabitation effect is spurious. Therefore, we add a set of standard control variables. Model 1 in Table 1 gives the results. The correlation between cohabitation and risk of divorce declines in the multivariate analysis, but is still positive. The divorce rate is 34 percent higher for marriages with cohabitation. Effects of

similar magnitude have been reported for other countries (e.g., Bennett et al. 1988; DeMaris und Rao 1992; Trussel et al. 1992; Bracher et al. 1993). At first glance, these results clearly contradict the trial marriage hypothesis. However, the drastic reduction in the size of the cohabitation effect from Model 0 to Model 1 suggests that cohabiting couples are self-selected towards characteristics associated with a higher divorce risk. We control for some of these characteristics in Model 1, but there is much room for unobserved characteristics by which cohabiting couples self-select, as shown by the pseudo R^2 value of only 5.7 percent.

[Table 1 here]

We obtain a first hint of the existence of such unobserved factors through the second multivariate model that includes two indicators of personal attitudes: an index of attitudes towards marriage and an indicator of religiosity. The mean comparisons presented in Table 2 reveal lower degrees of marital orientation and religiosity among cohabiting respondents on average. For marriages not divorced at the time of the interview, these differences are highly significant (we do not present tests for divorced marriages because the direction of causality might be reversed for them). Now we incorporate these two indicators into Model 1. Model 2 in Table 1 gives the results. Both indicators have strong, divorce-rate lowering effects. Consequently, the cohabitation effect declines even further and becomes non-significant. The lower marriage orientation and religiosity of cohabitators explain part of the cohabitation effect (see also Booth and Johnson 1988). This is a first hint that the positive correlation between cohabitation and divorce risk is due to the fact that cohabiting persons are a selected group. We say “hint,” because the cohabitation effect is still not less than one. We would argue that this is due to our two indicators not being perfect measures for the self-selected traits. In addition, they also have the problem that they are measured at time of interview, not at time of the marriage, as would have been preferable. Given the imperfect nature of these two indicators, they are not used further in the following.

[Table 2 here]

Effects of Controls. Besides the cohabitation effect, the analysis presented in Table 1 (Model 1) provides some interesting results not previously observed in German divorce studies (e.g.,

Diekmann und Klein 1991; Wagner 1993). Firstly, consider the couple-specific variables in the second panel of Table 1. Our model reproduces the well-known fact that divorce rates increased steadily after the Second World War, as can be seen by the monotonic increasing cohort effects. Divorce rates in towns, and especially in villages, are much lower than in large cities. The village effect of 0.54 means that the divorce rate is 46 percent lower in villages than in large cities. Catholic couples have a lower divorce risk, couples without religious affiliation a higher one. Heterogamous couples (regarding religion and nationality) have higher divorce rates. Age at the start of the partnership has a strong effect: the older the partners are, the lower the divorce rate. Education shows no effects. The same is true for premarital birth, but the birth of a child during marriage lowers the divorce rate drastically (this effect might be overestimated due to self-selection, cf. Lillard 1993). The respondent-specific origin variables in panel three of Table 1 all increase the divorce rate. Having no siblings and being of higher social origin increases divorce risk. The same is true for respondents from incomplete families, especially for those, whose parents were divorced by the time the respondent was aged 15 (more on this “transmission effect” can be found in Diekmann und Engelhardt 1999).

Methodological Note. At this point, a methodological objection must be dealt with: Some authors (e.g., Teachman und Polonko 1990) argue that cohabitation simply increases the divorce rate because previously cohabiting marriage partners live together longer. This argument, however, is incorrect because the cohabitation time is not included in the risk set (only “successful” cohabitation is included in our sample). However, it could be argued that most cohabiting couples start their marriage right in the “high risk” period, two or three years after the start of their relationship. This is not taken into account by the standard approach, where time starts at zero with the beginning of marriage for all observations. If we let time start at the number of cohabitation years (conditional likelihood) and re-estimate Model 1, we actually then see that the cohabitation effect is reduced substantially to 1.13 (t-value 1.20). This is even more in accordance with our argument that the cohabitation effect should decline in a multivariate model. Nevertheless, we prefer the standard modelling approach because it is easier to understand.

Indirect Tests of the Self-Selection Hypothesis

In the following, we will derive two indirect tests that could possibly reinforce the self-selection

argument. Our first argument is based on the fact that the proportion of marriages with premarital cohabitation has increased over time. In our data, this proportion has increased from under 10 percent for the marriage cohorts before 1970 to more than 50 percent for the most recent marriage cohorts. Obviously, strong no-cohabit norms existed in former times and those who nonetheless cohabited were those with unconventional attitudes. In more recent cohorts, these norms declined and the decision to cohabit was no longer an indicator of unconventionality. Therefore, if the self-selection theory is correct, we would expect much stronger cohabitation effects in older cohorts in Germany because cohabitators were much more unusual in those days (this argument was put forward by Schoen 1992).

To investigate this argument empirically, we add interaction effects for cohabitation and marriage cohort to Model 1. The results (Table 3, panel one) confirm this hypothesis. Cohabiting couples from the 1970s and 1980s show lower effects than the cohorts from the 1950s and 1960s (the difference is not significant, however). Their divorce rates become almost equal to those who did not cohabit. (Note that, in Table 3, cohabiting couples from the 1950s and 1960s are the reference group. Consequently, the effect for “no cohabitation” is lower than one.)

It is an interesting digression to look at a second implication of this argument. For societies where premarital cohabitation became the norm, we would expect that non-cohabitators are the special group. This seems to be the case for Sweden. As Hoem and Hoem (1992) demonstrate, the divorce rate difference between cohabitators and non-cohabitators increased over cohorts.

A second indirect test of the self-selection argument follows from the additional argument that those with more than one cohabitation should be an even more self-selected group (Bennett et al. 1988; Teachman and Polonko 1990). That is, these respondents already displayed in their behavior that they are more separation prone. Therefore, we would expect that multiple cohabitators show even higher divorce rates than single cohabitators. Panel two in Table 3 shows that this group actually does have a higher divorce risk compared to those who cohabited only with their first spouse. However, the effect is not significant.

[Table 3 here]

Indirect Tests of the Trial Marriage Hypothesis

Next, we will consider three indirect tests of the information argument from family economics. Firstly, some respondents cohabited for some time before their first marriage, but not with their spouse ($N = 74$). Those should be self-selected in a similar way compared to those respondents who only cohabited with their spouse. However, this group clearly lacks the more reliable information about the spouse which is obtained by living together before marriage. There simply was no trial marriage. Thus, they should have a higher divorce risk. The difference could even be interpreted as the „pure“ trial marriage effect (if both groups are really self-selected in a similar way; an assumption that we cannot test). Panel two in Table 3 shows that the divorce rate of those not having cohabited with their spouse is higher by a factor of 1.87. With some reservation, we can conclude that a trial marriage with the spouse seems to provide information that reduces the divorce rate (a counterargument could be that those cohabiting not with the spouse have already experienced a separation, what might increase their divorce proneness).

According to the information argument, one would also expect that the longer the trial marriage lasts, the lower the risk of divorce. The reason for this is that the longer cohabitation lasts, the more reliable the information gained will be. To test this hypothesis, we add three dummies that differentiate cohabitators by the length of their cohabitation to Model 1. Panel three in Table 3 gives the results. It can be seen clearly that those with longer cohabitation have lower divorce rates. Those cohabiting for four years or more no longer differ from those with no cohabitation (see also Bennett et al. 1988; Lillard et al. 1995). Although these effects are not significant, the pattern at least supports the information argument.

A third test of the information argument departs from the observation that a child born in a non-marital partnership increases the probability of marriage (Blossfeld 1995: 20). When a child is on its way, some cohabitators might marry even though the information-gathering process is not yet complete. Consequently, cohabitators with a premarital child should show higher divorce rates. Panel four in Table 3 provides an empirical test of this hypothesis. It shows that there is a non-significant difference in the expected direction.

Overall, the results of these five indirect tests are fully compatible with our argument: A trial marriage provides information that lowers the divorce rate of a subsequent marriage.

Self-selection obscures this in the standard regression approach. The evidence, however, is only indirect in that it relies on additional assumptions. Nevertheless, such a consistent picture as we observe it in Table 3 strongly increases our confidence in the argumentation. The most direct evidence is the result that cohabitation with the spouse decreases the divorce rate drastically (compared to those cohabiting with another person). This demonstrates most directly the informational value of a cohabitation.

A Simultaneous Model

The estimation results of the bivariate probit model appear in Table 4. The specification is similar to Model 1 in Table 1, with the exception that “no siblings” and “child before marriage” were not included due to their non-significant effects. In addition, we excluded “education” from the divorce equation to make identification of the model easier. The first two columns are from the single-equation probits, the last two are simultaneously estimated with a bivariate probit model.

[Table 4 here]

We include the single equation estimates as a comparison. The results for cohabitation are very similar, but they differ for divorce. This demonstrates that single-equation models are potentially misleading for these data. The cohabitation effect changes dramatically. The single equation divorce probit shows a small positive cohabitation effect. This is not completely in line with the result from the divorce rate model in Table 1, but it would still suggest that the trial marriage hypothesis is wrong. However, if we allow for correlated error terms and estimate a bivariate probit model the cohabitation effect becomes (non-significantly) negative (the same result was obtained by Lillard et al. (1995) using a simultaneous transition rate model). As predicted by the trial marriage hypothesis, cohabitation reduces the probability of divorce. The single equation estimates are biased because they do not allow for correlated error terms that are due to self-selection. This refined statistical model finally provides us with some direct evidence that the trial marriage hypothesis is correct.

Before concluding, let us take a brief look at some further results of the bivariate probit in Table 4. The first thing to note is that most effects are in the same direction for cohabitation and divorce. This supports the argument underlying our self-selection theory because it shows that

most factors that increase the probability of a divorce also increase the probability of cohabitation. This is also valid for the unmeasured variables as suggested by the positive estimate of ρ .

Finally, let us take a closer look at the cohabitation part of the bivariate probit. These results inform us about the factors that determine the probability of a (premarital) cohabitation. We can see that the probability of cohabitation is lower in rural areas and among Catholics. The opposite is true for people with no denomination and for women with higher education. These results are well in accordance with those obtained by other studies on those entering into cohabitation (e.g., Bumpass und Sweet 1989; Bumpass et al. 1991; Thornton 1991; Clarkberg et al. 1995).

Conclusion

Taken together, we think that these results show that the information argument put forward by family economists is correct. Premarital cohabitation provides information which allows for a more precise estimate of match quality with the prospective spouse. Therefore, marriages with prior cohabitation will be more stable on average. Demonstrating this is not easy, however. A simple comparison of couples who cohabited with those who did not shows that the former have higher divorce rates. By using several indirect tests and a more direct bivariate probit model, we demonstrated that this is due to self-selection. Cohabitors have characteristics that increase the probability of divorce. This overcompensates the stabilizing effect of a trial marriage.

The secular increase in divorce rates in most industrialized countries, therefore, cannot be explained by the growing prevalence of premarital cohabitation. On the contrary, according to our results cohabitation is a counteracting factor. Divorce rates would be even higher if trial marriages had not become a common demographic phenomenon.

We want to conclude by discussing three problems of our study. First, we argued that cohabitators differ from non-cohabitators already *before* they start to cohabit. However, we cannot rule out the possibility that they become different *while* cohabiting. The latter would mean that cohabitation has two opposing causal effects: making people more divorce prone and providing them with information on their potential mate. Though we think these arguments are not very plausible, a stringent empirical test would be only possible by using panel data (cf. Axinn and Thornton

1992).

Second, our analysis also delivers a methodological message. Sociologists and demographers using non-experimental survey data have to be much more aware of the possibility of self-selection to avoid incorrect causal conclusions. For that purpose, indirect tests are necessary as well as more refined statistical models that take self-selection into account, as we demonstrated in this paper. However, an even more preferable way for tackling self-selection would be better measurement. There would be no need for refined statistical models if one could measure those characteristics on which respondents self-select. Thus, the problems we have in disentangling self-selection from causal effects are an important argument for putting more effort into collecting better data.

Third, we argued in another paper that standard divorce models as we use them in this paper are misspecified (Brüderl et al. 1999). Two of these specification improvements we already discussed in this paper: using age at start of partnership and the conditional likelihood approach. A third improvement is the inclusion of two additional information indicators (how long the mates knew each other before beginning the relationship, and how long they had a relationship before starting to live together). All these improvements together have the consequence that the cohabitation effect is already significantly negative in Model 1. This means that we do not need the indirect tests and simultaneous models of this paper to show that cohabitation provides information that increases the stability of a subsequent marriage.

References

- Axinn, William G., and Arland Thornton, 1992: The Relationship Between Cohabitation and Divorce: Selectivity or Causal Influence? *Demography* 29: 357–374.
- Balakrishnan, T. R., K. Vaninadha Rao, Evelyne Lapierre-Adamcyk and Karol J. Krotki, 1987: A Hazard Model Analysis of the Covariates of Marriage Dissolution in Canada, *Demography* 24: 395–406.
- Becker, Gary S., 1991: *A Treatise on the Family*. Cambridge: Harvard University Press.
- Becker, Gary S., Elisabeth M. Landes and Robert T. Michael, 1977: An Economic Analysis of Marital Instability, *Journal of Political Economy* 85: 1141–1187.
- Bender, Donald, Walter Bien and Hiltrud Bayer, 1996: *Wandel und Entwicklung familialer Lebensformen: Datenstruktur der DJI-Familiensurvey*. Munich: unpublished paper.
- Bennett, Neil G., A. K. Blanc and David E. Bloom, 1988: Commitment and the Modern Union: Assessing the Link Between Premarital Cohabitation and Subsequent Marital Stability, *American Sociological Review* 53: 127–138.
- Blossfeld, Hans-Peter, 1995: Changes in the Process of Family Formation and Women's Growing Economic Independence: A Comparison of Nine Countries. pp. 3–32 in: Hans-Peter Blossfeld (ed.): *The New Role of Women: Family Formation in Modern Societies*. Boulder: Westview.
- Blossfeld, Hans-Peter, and Götz Rohwer, 1995: *Techniques of Event History Modeling: New Approaches to Causal Analysis*. Hillsdale, N.J.: Lawrence Erlbaum.
- Booth, Alan, and David Johnson, 1988: Premarital Cohabitation and Marital Success, *Journal of Family Issues* 9: 255–272.
- Bracher, Michael, Gigi Santow, S. Philip Morgan and James Trussell, 1993: Marriage Dissolution in Australia: Models and Explanations, *Population Studies* 47: 403–425.
- Brüderl, Josef, Andreas Diekmann and Henriette Engelhardt, 1999: Artefakte in der Scheidungsursachenforschung? Eine Erwiderung auf einen Artikel von Yasemin Niephaus, *Kölner Zeitschrift für Soziologie und Sozialpsychologie* 51: 744–753.
- Bumpass, Larry L., and James A. Sweet, 1989: National Estimates of Cohabitation, *Demography* 26: 615–625.
- Bumpass, Larry L., James A. Sweet and Andrew Cherlin, 1991: The Role of Cohabitation in Declining Rates of Marriage, *Journal of Marriage and the Family* 53: 913–927.
- Clarkberg, Marin, Ross M. Stolzenberg and Linda J. Waite, 1995: Attitudes, Values, and Entrance into Cohabitation versus Marital Unions, *Social Forces* 74: 609–634.
- Cohen, Blair A., 1991: Using Age at First Union to Explain the Relationship Between Cohabitation and Divorce. Population Studies Center, University of Michigan, Research Report No. 91–209.
- Cunningham, John D., and John K. Antill, 1994: Cohabitation and Marriage: Retrospective and Predictive Comparisons, *Journal of Social and Personal Relationships* 11: 77–93.
- DeMaris, Alfred, and K. Vaninadha Rao, 1992: Premarital Cohabitation and Subsequent Marital Stability in the United States: A Reassessment, *Journal of Marriage and the Family* 54: 178–190.
- DeMaris, Alfred, and William MacDonald, 1993: Premarital Cohabitation and Marital Instability: A Test of the Unconventionality Hypothesis, *Journal of Marriage and the Family* 55: 399–407.
- Diekmann, Andreas, and Henriette Engelhardt, 1999: The Social Inheritance of Divorce: Effects of Parent's Family Type in Postwar Germany, *American Sociological Review* 64: 783–793.
- Diekmann, Andreas and Thomas Klein, 1991: Bestimmungsgründe des Ehescheidungsrisikos: Eine empirische Untersuchung mit den Daten des sozioökonomischen Panels, *Kölner Zeitschrift für Soziologie und Sozialpsychologie* 43: 271–290.
- Diekmann, Andreas and Peter Mitter, 1984: A Comparison of the „Sickle Function“ with Alternative Stochastic Models of Divorce Rates. pp. 123–153 in: Andreas Diekmann and Peter Mitter (eds.): *Stochastic Modelling of Social Processes*. Orlando: Academic Press.
- Fisher, Helen, 1993: *Anatomie der Liebe*. München: Droemer Knauer.
- Gostomski, Christian Babka von, Josef Hartmann and Johannes Kopp (1998) Soziostrukturelle Bestimmungsgründe der Ehescheidung, *Zeitschrift für Sozialisationsforschung und Erziehungssoziologie* 18: 117–133.

- Greene, William, 1995: LIMDEP, 7.0. User's Manual. New York: Econometric Software.
- Hall, Anja, 1997: 'Drum prüfe, wer sich ewig bindet': Eine empirische Untersuchung zum Einfluß vorehelichen Zusammenlebens auf das Scheidungsrisiko, *Zeitschrift für Soziologie* 26: 275–295.
- Hall, David R., and John Z. Zhao, 1995: Cohabitation and Divorce in Canada: Testing the Selectivity Hypothesis, *Journal of Marriage and the Family* 57: 421–427.
- Hoem, Britta, and Jan M. Hoem, 1992: The Disruption of Marital and Non-Marital Unions in Contemporary Sweden. pp. 61–93 in: James Trussell, R. Hankinson and J. Tilton (eds.): *Demographic Applications of Event History Analysis*. Oxford: Clarendon Press.
- Holm Larsen, Anders, and Götz Rohwer, 1993: Self Selection in Transition Rate Models. Bremen: TDA Working Paper 5–8.
- Kahn, Joan R., and Kathryn A. London, 1991: Premarital Sex and the Risk of Divorce, *Journal of Marriage and the Family* 53: 845–855.
- Kopp, Johannes, 1994: Scheidung in der Bundesrepublik: Zur Erklärung des langfristigen Anstiegs der Scheidungsraten. Wiesbaden: Deutscher Universitäts-Verlag.
- Lillard, Lee A., 1993: Simultaneous Equations for Hazards: Marriage Duration and Fertility Timing, *Journal of Econometrics* 56: 198–217.
- Lillard, Lee A., Michael J. Brien and Linda J. Waite, 1995: Premarital Cohabitation and Subsequent Marital Dissolution: A Matter of Self-Selection? *Demography* 32: 437–457.
- Rindfuss, Ronald R. and Audrey VandenHeuvel, 1990: Cohabitation: A precursor to marriage or an alternative to being single? *Population and Development Review* 16: 703–726.
- Schoen, Robert, 1992: First Unions and the Stability of First Marriages, *Journal of Marriage and the Family* 54: 281–284.
- Teachman, Jay D., and Karen A. Polonko, 1990: Cohabitation and Marital Stability in the United States, *Social Forces* 69: 207–220.
- Teachman, Jay D., Jeffrey Thomas and Kathleen Paasch, 1991: Legal Status and the Stability of Coresidential Unions, *Demography* 28: 571–586.
- Thomson, Elizabeth, and Ugo Colella, 1992: Cohabitation and Marital Stability: Quality or Commitment? *Journal of Marriage and the Family* 54: 259–267.
- Thornton, Arland, 1991: Influences of the Marital History of Parents on the Marital and Cohabital Experiences of Children, *American Journal of Sociology* 96: 868–894.
- Trussell, James, and K. Vaninadha Rao, 1989: Premarital Cohabitation and Marital Stability: A Reassessment of the Canadian Evidence, *Journal of Marriage and the Family* 51: 535–544.
- Trussell, James, German Rodriguez and Barbara Vaughan, 1992: Union Dissolution in Sweden. pp. 38–60 in: James Trussell, R. Hankinson and J. Tilton (eds.): *Demographic Applications of Event History Analysis*. Oxford: Clarendon Press.
- Vaskovics, Laszlo A., and Marina Rupp, 1995: Partnerschaftskarrieren: Entwicklungspfade nichtehelicher Lebensgemeinschaften. Opladen: Westdeutscher Verlag.
- Wagner, Michael, 1993: Soziale Bedingungen des Ehescheidungsrisikos aus der Perspektive des Lebensverlaufs. pp. 372–393 in: Andreas Diekmann and Stefan Weick (eds.): *Der Familienzyklus als sozialer Prozeß*. Berlin: Duncker & Humblot.
- White, Lynn, 1990: Determinants of Divorce: A Review of Research in the Eighties. *Journal of Marriage and the Family* 52: 904–912.

Table 1: Models for the Divorce Rate of German Marriages (Sickle Models, Relative Risks): German Family Survey, Marriage Cohorts 1949–1988

	Mean	Model 0	Model 1	Model 2
Premarital cohabitation (t -value)	21.9%	2.28*** (9.56)	1.34** (3.02)	1.21 (1.92)
Marriage cohorts 1961–70	32.2%		1.83***	1.59***
Marriage cohorts 1971–80	31.7%		2.44***	1.80***
Marriage cohorts 1981–88	21.3%		2.86***	2.02***
Living in village (<5,000 inhabit.)	14.4%		0.54***	0.71*
Living in town (5,000–100,000)	27.1%		0.75**	0.88
Catholic couple	32.8%		0.71***	0.83
Couple without denomination	4.5%		2.10***	1.60***
Couple with mixed denomination	26.2%		1.27**	1.24*
Partner is foreigner	3.1%		1.64**	1.74**
Age at start of partnership (man)	24.69		0.96***	0.97*
Age at start of partnership (woman)	22.15		0.91***	0.92***
Years of education (man)	9.92		0.94	0.92**
Years of education (woman)	9.69		1.00	0.94
Child born before marriage	6.2%		0.93	0.93
Birth of first child (time varying)	75.0%		0.42***	0.44***
No siblings	10.8%		1.29*	1.33**
Father completed high-school	7.7%		1.53**	1.38*
No parents	3.1%		1.53*	1.55*
One parent	9.6%		1.27*	1.15
Divorced parents	2.4%		1.71**	1.55*
Church attendance	21.4%			0.64***
Index of marriage orientation	9.29			0.77***
Constant α_0		0.00	0.11	1.37
Ponstant λ		7.84	10.28	11.25
Pseudo R^2		0.9%	5.7%	9.4%
Number of marriages		6179	5846	5786
Number of splits			10183	10080

* statistically significant at the 5% level, ** 1%-level, *** 0.1% level (two-sided test). Pseudo R^2 is computed as the relative likelihood improvement compared to the model without covariates.

Table 2: Means of Attitude Variables for Persons with and without Cohabitation:
German Family Survey, Marriage Cohorts 1949–1988

Cohabitation	<u>Not divorced</u>		<u>Divorced</u>	
	Without	With	Without	With
Church attendance	26.6% ***	10.5%	10.1%	7.7%
Index of marriage orientation	9.79 ***	8.54	7.88	7.45
Number of marriages	4076	1173	577	182

*** statistically significant difference at the 0.1% level (two-sided test). Tests are only performed for marriages not divorced.

**Table 3: Effects of Cohabitation under different Model Specifications:
German Family Survey, Marriage Cohorts 1949–1988**

Model	Variable	Effect
Cohabitation effect for different marriage cohorts	No cohabitation	0.63***
	Cohabitation: marriage cohorts 1949–70 (reference)	1.00
	Cohabitation: marriage cohorts 1971–80	0.76
	Cohabitation: marriage cohorts 1981–88	0.69
Cohabitation effect for different numbers of cohabitations	No cohabitation	0.74**
	Cohabitation only with spouse (reference)	1.00
	Cohabitation with spouse and another partner	1.51
	Cohabitation not with spouse but with another partner	1.87*
Cohabitation effect by duration of cohabitation	No cohabitation	0.68***
	Cohabitation 1 year (reference)	1.00
	Cohabitation 2 years	0.81
	Cohabitation 3 years	0.87
	Cohabitation 4+ years	0.65
Cohabitation effect for unions without and with a premarital child	No cohabitation	0.77*
	Cohabitation before marriage without child (reference)	1.00
	Cohabitation before marriage with child	1.26

* statistically significant at the 5% level, ** 1% level, *** 0.1% level (two-sided test). The models include the same covariates as Model 1 in Table 1.

Table 4: A Simultaneous Model for the Probabilities of Cohabitation and Divorce (Marginal Effects): German Family Survey, Marriage Cohorts 1949–1980

	<u>Probit</u> Cohabitation	<u>Probit</u> Divorce	<u>Bivariate Probit</u>	
			Cohabitation	Divorce
Cohabitation before marriage (t -value)		0.005 (0.83)		-0.085 (1.35)
Marriage cohorts 1961–70	0.024	0.024**	0.024	0.030**
Marriage cohorts 1971–80	0.162***	0.040***	0.162***	0.071***
Living in village (<5,000 inhab.)	-0.053***	-0.026**	-0.054***	-0.038***
Living in town (5,000–100,000)	-0.049**	-0.009	-0.049***	-0.018*
Catholic couple	-0.060***	-0.027***	-0.060***	-0.040***
Couple without denomination	0.058**	0.026**	0.058**	0.039***
Couple with mixed denomination	-0.004	0.007	-0.004	0.008
Partner is foreigner	0.044	-0.001	0.042	0.009
Years of education/10 (man)	-0.012		-0.003	
Years of education/10 (woman)	0.115*		0.113*	
Age at start of union/10 (man)		-0.016		-0.017
Age at start of union/10 (woman)		-0.053***		-0.059***
Child born during first 7 years		-0.062***		-0.071***
Father completed high school	0.034*	0.007	0.033	0.015***
No parents	0.039	0.029**	0.039	0.039**
One parent	0.020	0.018*	0.022	0.023*
Divorced parents	0.047	0.012	0.046	0.021
Correlation coefficient			0.59	
Pseudo R ²	9.8%	17.5%	12.6%	
-Log-likelihood	1641.5	828.0	2468.4	
Number of marriages	4577	4577	4577	

* statistically significant at the 5% level, ** 1% level, *** 0.1% level (two-sided test). Pseudo R² is computed as the relative likelihood improvement compared to the model without covariates.

Figure 1: A Model of the Relationship of Cohabitation and Divorce

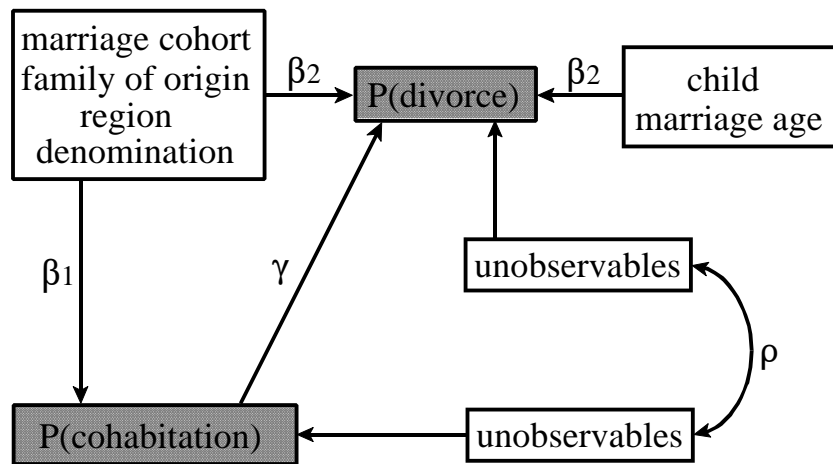


Figure 2: Life-table Divorce Rates for three German Marriage Cohorts:
German Family Survey, Marriage Cohorts 1949-1988

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Figure 3: Proportion of Marriages not Divorced (Kaplan-Meier Estimates; 95% Confidence Interval Shaded): German Family Survey, Marriage Cohorts 1971–1988

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