Educational Assortative Mating and Divorce

A Longitudinal Analysis of the Influences of Education on the Divorce Rate for Different Educational Matches

Abstract

In this paper, we investigate the impact of educational assortative mating on divorce by using new life course data from the German National Educational Panel Study (NEPS). Based on a new theoretical model, we show that there are not only benefits from division of work but also benefits from communication within married couples. The empirical results show that the combined gains and losses of division of work and communication are different for educationally married up, homogamous or down women. Women's upward marriages are the most stable ones, with homogamous marriages ranking second, followed by the least stable marriages, those where women married educationally down. Our analysis also demonstrates that there is no "success" penalty in terms of a higher divorce rate for highly educated married down women.

Keywords: educational assortative mating, educational human capital, divorce, doing gender

Introduction

In recent decades, divorce rates have risen in most modern societies (Raley and Bumpass 2003; Fischer and Liefbroer 2006; De Graaf and Kalmijn 2006; Diekmann and Engelhardt 1999). Based on the dominant traditional family model in the 1960s and 1970s, sociologists and economists have related this increase in divorce risks, among other factors, to women's better education and their ability to turn their educational investments into career gains. The literature analyzing the effect of women's education on divorce is voluminous. Most empirical studies have concentrated their analysis only on the correlation between women's educational attainment level and divorce risk, after controlling for other influences. For example, the studies of De Rose (1992) and Hoem (1997) show that the divorce risk rises with women's better education. Yet, there are also other studies which demonstrate the opposite. For example, Chan and Halpin (2005) show for the UK that marital instability declines if women have a higher educational attainment. The problem of this type of analysis is that it only considers women's education without taking into account the education of the husband.

There are few studies that have estimated the net association of divorce rates with the education of both spouses (e.g. Rapp 2008; Bracher et al. 1993; Jalovaara 2001). However, this research has provided inconclusive evidence, too. For example, results for the Nordic countries (Jalovaara 2003; Lyngstad 2004), Germany (Rapp 2008) and the U.S. (Tzeng and Mare 1995; Gihleb and Lifshitz 2012) show a negative effect of the level of education of both partners on divorce risk. However, findings for the Netherlands (Poortman and Kalmijn 2002), on the other hand, have revealed a positive effect of the wife's educational attainment level on divorce risk and a negative one of the husband's educational attainment. We believe that these contradictory effects of education on divorce might be the result of an analysis design that studies divorce risks on the educational level of spouses without taking into account educational matches within particular marriages.

Bumpass and Sweet (1972) were the first among the very few, who studied marital stability for homogamous and heterogamous marriages, taking into account the educational differences within couples. They conclude that although homogamy increases marital stability, the effects of the association of educational heterogamy with high marital instability cannot generally be supported. Tzeng (1992) also finds that homogamous marriages are more stable but that heterogamous couples are more likely to experience marital disruption. The problem of this research is that the interpretation of the effect of educational gaps within heterogamous couples is complicated by the many

social meanings of education. In particular, the economic theory of the family expects for couples where women are marrying a partner with a lower educational attainment level that there is a high probability that these couples turn the traditional gender-specific specialization around. This should lead to a reversal of the effects of education for husbands and wives on the divorce rate. If this is the case, empirical studies which aggregate the effects of each spouse's education across heterogamous matches would mix-up positive and negative effects of educational attainment on the divorce rate and lead to inconclusive results. The present study is done in an attempt to find answers to some of the discrepancies in the earlier studies. We disaggregate the marriages of women into upward, downward and homogamous marriages and estimate the specific impacts of spouses' education on divorce in these different educational matches. We believe that these disaggregated models might yield impressive increases in theoretical understanding and a more clear-cut interpretation of estimation effects.

Using brand new life course data from the 'National Educational Panel Study' (NEPS), we are analyzing the divorce risk of couples where women have married educationally downward, upward or homogamous in East and West Germany over the last four decades. In particular, the NEPS data allow to control for the impact of German unification on marital dissolution in East and West Germany, since it offers longitudinal data from a broad range of successive cohorts born between 1944 and 1986.

The paper is organized as follows. First, based on several theoretical approaches, we advance a theory of the influences of education on the divorce rate of different educational matches and formulate testable hypotheses. Second, we describe the longitudinal data and the event history methods we are using. Third, we report the results of our longitudinal analysis and draw some more general conclusions regarding divorce theories and future research.

Theoretical Perspectives

Women marrying up

In a traditional marital setting, where women marry up, sociologists and economists predict a negative association between women's education and the divorce rate. The type of conjugal family considered is a couple with children where the husband is the male breadwinner and the wife is a homemaker who is only loosely attached to the labor force. The conventional sociological view maintains that it is the family rather than the individual which forms the

basic unit of social stratification (Goldthorpe 1983: 465). It is assumed that all members of the family share the same status, class position, life chances and lifestyles. In this family model, one member - typically the husband - has a full commitment to the participation in the labor market and determines the status of the family as a whole (Goldthorpe 1983: 465). Married women are required by conventional norms to take major responsibility for maintaining the household and rearing children, which restricts their opportunity for participation in gainful employment. In other words, the traditional family model forces women into an economic dependence on their husbands. If women are better educated relative to their husbands, this makes them less dependent on their spouses and increases the divorce rate (*female independence hypothesis*). De Graaf and Kalmijn (2006) suggest that in this marital setting also the husband might feel that it is easier to end the marriage when his wife is more independent. Another hypothesis was put forward by Parsons (1949) who claimed that women's increased education and work in the traditional context might lead to a status competition and tensions between the spouses which increases the divorce risk (*spousal status competition hypothesis*).

In a gender-traditional society, according to the economic theory of the family, men and women invest differently into their human capital. Men tend to invest into qualifications and skills that increase their earnings capacity while women tend to invest into non-market skills enabling them to fulfill their domestic duties. In the model of the economic theory of the family, men and women marry because both gain from their different gender-specific investments at the time of marriage and their progressive gender-specific division of work within marriage (Becker 1981). In other words, marriage is seen as an exchange of fungible resources (market versus non-market skills). Within marriage, it is then specialization which increases the financial gains to marriage due to greater efficiency inside marriage. The traditional model implies that the predominant marriage pattern is one where women marry educationally upward and men marry educationally downward – and indeed, this was the marriage pattern of the majority in Germany up to the early 1970s (Blossfeld and Timm 2003: 25). Becker et al. (1977) predict, that education of the husband should have a negative impact on the divorce rate because (1) higher qualified husbands profit more from the division of work in a traditional marriage and (2) women with a better educated husband have financially more to lose after a divorce (*male breadwinner hypothesis*). Conversely, if women are better educated and increase their income potential relative to their husbands this reduces the gains from specialization within the traditional marriage and increases the risk of divorce (*reduced specialization hypothesis*) (De Graaf and Kalmijn 2006).

Educational Expansion and Assortative Mating

Since the 1960s, the educational attainment of both men and women increased substantially in the course of educational expansion in Germany. In this process, women gained more than men, so that women began to surpass men's educational attainment level in the early 2000's (Bildungsbericht 2012). Most important, women have higher university graduation rates than their male counterparts. This catching-up process of women in education and the change in the educational gender gap quickly translated into an increase of homogamous marriages and a reversal of the education gap among husbands and wives for more and more couples (Blossfeld and Timm 2003: 25).

Dimensions of Education

The interpretation of education in the traditional economic family model is, however, very specific. Education is mainly seen as an indicator of the individual's levels of human capital and market skills. The higher the educational attainment level, the higher the market skills. In other words, education is reduced to its economic dimension as an income potential and an indicator of economic success. However, education is much more. It also reflects individuals' cultural, symbolic and social resources as well as varying socialization experiences. It is an indicator of the ability to participate in a status culture that permits actors to "get ahead by managing impressions, developing positive local reputations, impressing gatekeepers, and constructing social networks that may be useful in educational, marital, and occupational attainment" (DiMaggio and Mohr 1985: 1235). In Bourdieu's theory of cultural reproduction "cultural capital consists of familiarity with the dominant culture in a society, and especially the ability to understand and use 'educated' language" (Sullivan 2002: 145). Like cultural capital, habitus is transmitted through socialization and education (Bourdieu 1977). It is a set of attitudes and values held by the individual, it constitutes a specific way of thinking and the competence to behave in specific social settings.

Social Meanings of Education in Marriages

Both sociological and economic theories suggest that the probability of a satisfactory marriage is the higher the more similar the spouses are with regard to education (Goode 1966; Bumpass and Sweet 1972; Becker et al. 1977). They emphasize the similarity because such spouses are likely to communicate easier, to speak a "similar language", to have a better understanding of each other, to participate in the same status culture, to have a value consensus on basic life goals and priorities as well as to hold similar expectations for marital roles (Bumpass and Sweet 1972). Conversely, the more different the spouses are with respect to education, the higher the likelihood of misunderstandings and tensions leading to a greater marital dissatisfaction and proneness to divorce.

This line of argument shows that if we study the impact of education on divorce, we have to make an analytical distinction between the contradictory impacts of the communication and economic dimensions of education on divorce. If the educational gap changes, there is a trade-off between the gains (or losses) from communication (ΔC) and the losses (or gains) from division of work (ΔW). The higher the gains from division of work within a couple, the higher the probability of losses of communication and vice versa. In other words, the change in the gross gains from the educational gap (ΔE) is dependent on the theoretically assumed relative sizes of the net gains from both sources:

$$\Delta E = \Delta W + \Delta C$$

In the economic literature, Becker et al. (1977) make this distinction when they separate positive assortative mating with respect to personal characteristics such as education, height, or intelligence from negative assortative mating with regard to earnings power connected with education or labor force experience. However, in most empirical analyses, economists tend to neglect the gains and losses of communication almost completely ($\Delta C \sim 0$).

Married Up Women

As discussed above, if we focus on traditional marriages, where women marry up, the economic theory of the family expects a negative impact of women's relative education on divorce. This means that if we compare two couples, one with a big educational gap with large benefits from division of work (W_1) and small benefits from communication (C_1) and one with a smaller educational gap with smaller benefits from division of work (W_2) and larger benefits from communication (C_2) ($W_1 > W_2$ and $C_1 < C_2$), then we should get $-\Delta W = W_2 - W_1$ and $\Delta C = C_2 -$

C_1. Thus, economists implicitly overemphasize the losses from negative assortative mating resulting from individual differences in human capital and specialization relative to gains from communication ($|-\Delta W| > |\Delta C|$). This is a strong theoretical assumption that can be empirically tested:

$\Delta E_{gap} = \Delta W + \Delta C$ with $\Delta W < 0$, $\Delta C > 0$ and $|\Delta W| > |\Delta C|$

$\Delta E_{gap} < 0$

If the economic theory is right, the educational gap between the spouses (*EduGap*) in a traditional couple should have a negative effect ($\alpha_1 < 0$) on the divorce rate ($r_W(t)$) in a discrete event history analysis (*dominance of gains from division of work hypothesis*):

$$r_W(t) = \frac{\exp(\alpha_1 \times EduGap + \cdots)}{1 + \exp(\alpha_1 \times EduGap + \cdots)}$$

with $\alpha_1 \equiv \Delta E_{gap} \rightarrow \alpha_1 < 0$ and other covariates controlled for.

Women Who Marry Homogamous

If we concentrate on homogamous marriages, the economic theory suggests that the advantage of the division of work within couples is close to zero ($W \sim 0$) because spouses are very similar, whereas the advantage of rewarding communication represents a kind of maximum for each level of education ($C_{max,E}$). This theory also predicts that homogamous couples with higher education gain more from marriage than homogamous couples with lower education (Becker et al. 1977). Also sociologists expect increasing advantages from more rewarding communication, if the educational attainment of homogamous couples rises (DiMaggio and Mohr 1985; Lewis and Spanier 1979; Amato 1996; Hoem 1997; Ono 1998; Dronkers 2002). In estimating the gains of educational level in homogamous couples (ΔE_{lev}) on divorce, we can therefore closely identify the gains of communication at different levels of education (ΔC) and test whether the predicted gains from communication increase with the level of education (*gains from higher education hypothesis*).

$\Delta E_{lev} = \Delta C$ with $\Delta C > 0$, $W \sim 0$ and $\Delta W = 0$

$\Delta E_{lev} > 0$

In discrete event history analysis for homogamous couples, we expect therefore that the educational level of spouses (*EduLev*) should have a negative effect ($\alpha_1 < 0$) on the divorce rate ($r_W(t)$):

$$r_W(t) = \frac{\exp(\alpha_1 \times EduLev + \cdots)}{1 + \exp(\alpha_1 \times EduLev + \cdots)}$$

with $\alpha_1 \equiv -\Delta E_{lev} \rightarrow \alpha_1 < 0$ and other covariates controlled for.

Married Down Women.

Finally, if we look at women's downward marriage, the gender-neutral economic theory of the family expects basically the same gains and losses from communication and division of work within couples as in marriages where women marry up. In other words, specialization increases the economic gains to non-traditional marriage due to greater efficiency inside marriage. Again, the gains from specialization are also considered more important than the gains from communication ($|\Delta W| > |\Delta C|$). The only difference is that the breadwinner and the homemaker roles are reverse among the spouses. Hence, in these non-traditional couples, it should be the wife who has a full commitment to the participation in the labor market and determines the status of the family as a whole. While the husband takes major responsibility for maintaining the household and rearing children, which restricts his opportunity for gainful employment. In the non-traditional family model, men are therefore forced into an economic dependence on their wives. The economic theory of the family expects a negative impact of men's relative education on divorce. It stresses the losses from negative assortative mating resulting from specialization relative to gains from communication ($|\Delta W| > |\Delta C|$). The gains from the educational gap (ΔE) are determined as follows:

$\Delta E_{gap} = \Delta W + \Delta C$ with $\Delta W < 0$, $\Delta C > 0$ and $|\Delta W| > |\Delta C|$

$\Delta E_{gap} < 0$

If the economic theory is right, the educational gap (*EduGap*) between wife and husband in a non-traditional marriage should have a negative effect ($\alpha_1 < 0$) on the divorce rate ($r_W(t)$) in a discrete event history analysis (*dominance of gains from division of work hypothesis*):

with $\alpha_1 \equiv \Delta E_{gap} \rightarrow \alpha_1 < 0$ and other covariates controlled for.

In addition, according to this reasoning, the educational attainment level of the wife should have a negative impact on the divorce rate because husbands with a better educated wife have financially more to lose after a divorce (*female breadwinner hypothesis*).

The economic theory of the family is gender-neutral and assumes that changes for wives and husbands are always symmetric. In other words, gender roles within couples are assumed to be simply reversible. However, there is the doing gender theory in sociology which claims that the behavior of spouses can not only be derived from relations of market and non-market exchange but also from the gender dimension. In modern societies, gender is still very important and makes the behavioral changes between the spouses asymmetric. This means, wives change but husbands don't or at least don't change as much as wives. In particular, if women married down and men married up, which is still not very common in Germany, husbands and wives violate normative expectations of masculine and feminine behavior (West and Zimmerman 1987). Therefore, if females are breadwinners and males are homemakers, they are socially accountable, risk negative judgements from friends, relatives and colleagues (West and Zimmermann 1987, Fenstermaker et al. 1991) and to some extend threat their gender identities (Bielby and Bielby 1989) (*gender norm violation hypothesis*). These couples are therefore very likely to compensate this deviation from the norm by adopting traditional gender behavior elsewhere (Brines 1994). In the doing gender approach, non-traditional spouses are expected to resort to traditional housework and childcare arrangements. This leads to situations where some domestic work, that could enhance the well-being and efficiency of the household, is left undone because the dependent husband does not engage in it and his wife increasingly has to struggle with two 'jobs' – one at home and one at work (Hochschild and Machung 1989; Brines 1994). This prediction is supported by empirical studies showing that husbands did not increase their housework hours when their wives work more (Cooke 2010; Blau et al. 2010; Noonan 2013; Schulz and Blossfeld 2012). The share of women's housework is in fact decreasing, but not because he works more, but because she is doing less if she is in paid employment (Baxter 1997). In other words, if the educational gap increases in non-traditional couples, there is not only a loss in gains from communication ($\Delta C < 0$) but also a drastically reduced gain from the division of work ($\Delta W > 0$) because of the low level of husband's engagement in the household (*reduced gains from education hypothesis*).

If we embed the doing gender model into our division of work/communication framework, several competing predications of the educational gender gap on divorce are possible:

(1) In the most extreme case, the more a husband's identity is threatened by his wife's breadwinner role, the less he can afford to threaten it further by doing also women's work at home (Brines 1994). With an increasing educational gap, one does therefore not only expect increasing losses of gains from communication ($\Delta C<0$) but also increasing losses from gains of division of work ($\Delta W<0$). In other words, the divorce rate ($r_W(t)$) should rise with the increase of the educational gap (*EduGap*):

$\Delta E_{gap} = \Delta W + \Delta C$ with $\Delta W < 0$ and $\Delta C < 0$

$\Delta E_{gap} < 0$

If we estimate an event history model, we therefore expect in this case $\alpha_1 > 0$ with $\alpha_1 \equiv -\Delta E_{gap}$, other covariates controlled for.

(2) Husband's engagement in housework is low, so that there are only small benefits from division of work ($W>0$) in non-traditional marriages and this low level is more or less constant across all educational gaps ($\Delta W=0$) (Blau et al. 2010). The change in the gains of the educational gap (ΔE_{gap}) is therefore only determined by the losses of gains from communication: $\Delta E_{gap} = \Delta C$

In this case, the effect of the education gap (α_2) on divorce in an event history analysis for non-traditional marriages should be positive ($\alpha_2 > 0$) but smaller than in case (1): $\alpha_2 < \alpha_1$

(3) Husband's engagement in housework is low, so that there are only small gains from the division of work ($W>0$) in non-traditional marriages, but his engagement in housework and the corresponding gains rise with the educational gap ($\Delta W > 0$). If the gains from the division of work are more or less equal to the losses in the gains from communication ($|\Delta W| \sim |\Delta C|$), then the gains from the educational gap are about zero ($\Delta E_{gap} = 0$) and the effect of the educational gap on the divorce rate ($r_W(t)$) in an event history model should not be statistically significant ($\alpha_3 = 0$), other covariates controlled for.

A Comparison Between Married Up, Down and Homogamous Women on Divorce

In the literature, there are studies that include a dummy-variable to estimate the effects of homogamous versus heterogamous marriages on divorce. Based on our discussion, it is clear that the interpretation of such a variable is

problematic because there are so many contradicting influences aggregated in this comparison. At least, heterogamous couples have to be distinguished into upward and downward marriages to test whether the doing-gender or the economic model is right. If we compare the effects of married up, down and homogamous women on divorce, we expect the following: Traditional marriages are most stable because they reflect a combination of stabilizing impacts from communication and division of work. The stability of marriages of homogamous couples should rank in the middle, because they mainly rely on gain from communication. According to the doing gender model, downward marriages suffer from both, from insufficient gains from division of work and lower gains from communication. In addition, they are exposed to a higher pressure from their social networks, because they violate gender norms. If the economic theory of the family is right, then there should be a role reversal among husband and wife and the marriage should be as stable as a traditional one. This means they should be more stable than homogamous marriages.

Further Differences in Marital Instability

Premarital cohabitation. It is a well established finding that marriages which began as cohabiting unions are less stable than those which did not (e.g. DeMaris and Rao 1992; Axinn and Thornton 1992; Lillard et al. 1995; Berrington and Diamond 2000; Bernardi and Martinez-Pastor 2011). A common explanation for this phenomenon is self-selection. Individuals who are uncertain about marriage and have more non-traditional marriage and family attitudes are more likely to cohabit before marriage (Bennett et al. 1988; DeMaris and McDonald 1993; Thompson and Colella 1992). These individuals are also assumed to be more likely to divorce. In other words, couples who cohabit prior to marriage are different people and should have a higher dissolution rate in our analysis.

Pregnancy at the time of first marriage. Women who experience an unplanned pregnancy often have a desire to marry quickly to avoid embarrassment and to 'legitimate' their children (Becker et al. 1977). In other words, they marry because they want the child to be born within a marital setting (shotgun wedding) rather than out of a strong desire of the partners. Therefore, we expect these marriages to be less stable in our analysis.

Premarital birth. Previous studies have shown a strong negative association between premarital birth and subsequent marital stability (Teachman 2002; Morgan and Rindfuss 1985, Bernardi and Martinez-Pastor 2011). Becker and colleagues (1977) argue that the presence of a child reduces the attractiveness to potential partners and

therefore the chances of women to find the desired partner. In other words, the fact that they have probably married a less desirable partner should increase the likelihood of divorce. Morgan and Rindfuss (1985) stress in addition that unmarried mothers might have less traditional values towards marriage and family and therefore are also more likely to divorce.

Age at entry into first marriage. An important finding in almost every empirical study on marital dissolution is that persons marrying much younger than average have a significantly higher probability of dissolution (e.g. Klein 1999; Böttcher 2006; Dyer 1986; Glick and Norton 1977; South and Spitze 1986; Diekman and Engelhardt 1995; Wagner 1997). According to Becker et al. (1977) and Oppenheimer (1988), couples that marry at a young age are more likely to experience a dissolution than older couples because: (1) these younger couples have spent insufficient time for searching for an appropriate partner; and (2) these partners have a looser bond, since they accumulated less couple specific capital before marriage and they have collected less information about the longer term characteristics of their (future) spouse.

Age disparity between the spouses. As shown earlier, Becker et al. (1977) expect that age homogamy should stabilize a partnership. Bumpass and Sweet (1972) argue that with a great age difference between the spouses there is a lower consensus between the partners with regard to values and norms. In other words, a greater age difference should be connected with a lower marital quality and stability (Levinger 1965; Engelhardt 2002; Bumpass and Sweet 1972). It also should matter whether the wife or the husband is older than the spouse. The social norm is that men are older than their wives. If wives are older than their husbands, this is against the social norm and should have a destabilizing effect on marriages.

Age of the youngest child within the household. The economic theory of the family considers children as marriage specific investments that stabilize a relationship, since they increase the gains from marriage and make divorce more costly. Nevertheless, a dissolution of a marriage with children could "be a response to the growing up of children" (Becker et al. 1977: 1152f), since the marriage specific capital could eventually decline. These expectations are supported by empirical research that shows a decline in marital stability with rising age of the youngest child within the household (Heaton 1990; Stauder 2006; Rapp 2008).

Duration of marriage. Different theories suggest that the risk of divorce changes strongly with marriage duration. According to Becker et al. (1977), the risk of marital disruption tends to decline as the duration of a marriage increases. "The reason is that marital-specific capital, such as children, sexual compatibility, and knowledge of one's mate, increases with duration." (Becker et al. 1977: 1157). In addition, there is a selection process. Couples with higher divorce risks leave the risk set earlier than couples with lower divorce risks so that with increasing duration the composition of the risk set changes towards more stable couples. Other theories suggest a non-monotonic (first increasing and then decreasing) risk of divorce for the marriage duration. In this view, the divorce rate reflects the interplay of two contradicting forces, the initially increasing need to resolve mismatches and the rise of marriage-specific investments. In other words, when men and women are matched under the condition of imperfect information and high search costs, mismatches can occur. Particularly during the first period of each new marriage, there will be intensive adjustment processes in which partners expectations are confronted with reality and unsatisfying marriages will increasingly be dissolved. However, when investments into marriage-specific capital rise with the duration of marriage, a point will be reached where the forces of resolving mismatches and the forces of marriage-specific capital become equally strong. This is the peak of the divorce rate within marriages. Normally, this point is reached after five to seven years of marriage. With further increasing marriage duration, the increases in marriage-specific capital will dominate the forces of resolving mismatches and the divorce rate will decline. In other words, we expect a bell-shaped pattern of the rate of divorce of first marriage that initially increases, reaches a peak, and then decreases with marriage duration (Brüderl and Engelhardt 1997; Dinkel 2006; Fooken and Lind 1997; Kopp 1994). The determination of the peak is an empirical matter.

Birth cohort. It is also well known that the divorce risk can be dependent on cohort- and period effects. We will therefore include birth cohorts into our analysis to control for long-term trends in the divorce rate in Germany.

The two Germanies before and after unification and place of birth. Furthermore, we will include period effects (before and after German unification) and the place of birth (distinguishing East and West German women) into our analysis, since both parts of Germany, the former German Democratic Republic (GDR) and the Federal Republic of Germany (FRG), differed markedly in their political systems and policies during the 40 years of division in Germany until 1990. Nevertheless, the divorce rates had a similar long-term rising trend in East and West Germany before the German unification. The East German divorce rate was always significantly higher in this historical

period. After the German unification, the divorce rate in East Germany declined and remained below the level of West Germany (Alt 2002). We will therefore control for the birth cohorts and period effects for East and West German women in our analysis.

Data, Methods of Analysis, and Variables

Data. Using life course data from the German National Educational Panel Study (NEPS)[1], we study women's divorce rates with event history models. The NEPS is a project collecting longitudinal data in a multi-cohort sequence design. One of the six NEPS cohorts is a representative sample of adults aged 23-65. For these respondents the NEPS offers retrospective family, educational and employment histories for 3,946 ever married women in East and West Germany born between 1944 and 1986. The NEPS data collection took place from November 2009 until June 2010. For a detailed description of the NEPS project and the design of the NEPS study, we refer the reader to Blossfeld, Roßbach and von Maurice (2011).

Dependent variables. We analyze the divorce of the first marriage for women. The divorce could happen at any point in time; however, the NEPS only collects dates of transitions and events on a monthly basis. For our analysis, we define for each woman a spell starting at entry into marriage. For women, who do not experience a divorce until the time of the interview, we censor the spells on the right. The spells are also right-censored for women whose husband died. This leads to a person-oriented spell data set, where each woman in the sample has exactly one record of data, including a series of time-constant covariates and information when time-varying covariates change their values.

Methods of analysis. We estimate a discrete-time event history logit model with time-constant and time-varying covariates x_i (Yamaguchi 1984)

$$r(t) = \frac{\exp(\alpha_1 \times x_1 + \alpha_2 \times x_2 + \cdots + \alpha_n \times x_n)}{1 + \exp(\alpha_1 \times x_1 + \alpha_2 \times x_2 + \cdots + \alpha_n \times x_n)}$$

[1] This paper uses data from the National Educational Panel Study (NEPS): Starting Cohort 6 – Adults (Adult Education and Lifelong Learning), doi:10.5157/NEPS:SC6:1.0.0. The NEPS data collection is part of the Framework Program for the Promotion of Empirical Educational Research, funded by the German Federal Ministry of Education and Research and supported by the Federal States.

If we have estimated the discrete-time transition rate r (t) based on a specified event history model, it is easy to compute the survivor G(t) function for various constellations of the covariates

$$G(t) = \prod_{l=1}^{t}(1 - (r(l))$$

Independent Variables. In our longitudinal analysis, we are using the following explanatory and control variables:

(1) *Duration of marriage (time-dependent covariate).* We include dummy variables distinguishing eight periods of marriage duration: '0-1 year', '2-3 years', '4-5 years', '6-7 years', 8-10 years', '11-15 years', 16-20 years' and '20+ years'.

(2) *Birth cohorts (time-constant).* To distinguish birth cohorts in our sample, we include the following time-constant dummy variables into our analysis: '1944-1950 (ref.), '1951-1960', '1961-1970', '1971-1980'. We exclude the youngest birth cohort ('1980-1986') from our analysis because this cohort is too young and doesn't have enough cases. In one model, we include interaction terms between the birth cohorts and educational homogamy.

(3) *Place of birth (time-constant covariate).* We use the dummy variable 'East' to identify women born in East Germany, women born in West Germany are the reference category.

(4) *Historical periods (time-dependent covariates) and German unification.* To distinguish the periods before and after unification in our analysis, we use the dummy variable 'Period after 1990.' The reference category is the 'Period until 1990.' We include also an interaction dummy variable 'East*Period after 1990' to estimate the effect of the 'German unification' on East German women.

(5) *Pre-marital states (time-constant).* We introduce three dummy variables to control if women cohabited with their husband at the time of marriage (ref. category: women who did not cohabit with their husband at the time of marriage), were pregnant at the time of marriage (ref. category: women who were not pregnant at the time of marriage) or have had a child before marriage (ref. category: women who had no child before marriage).

(6) *Age at first marriage (time-constant covariate).* We include the time-constant dummy variable 'young' into our analysis, indicating that the woman's age at entry into first marriage was under 23 years. 'Old' is the reference category and indicates if she was 23 years or older. We do not distinguishing more differentiated age categories here, since age at marriage and educational attainment levels are highly correlated in Germany.

(7) *Age disparity between the spouses (time-constant covariate).* We include the following time-constant dummy variables into our analysis, indicating whether the age disparity between the spouses is: 'Wife same age' (ref. category), 'wife older' and 'wife younger'.

(8) *Age of the youngest child (time-dependent covariate).* We include the age of the youngest child by distinguishing seven time-dependent dummy variables: 'no child' (ref. category), '<1 year', '1-2 years', '3-5 years', '6-10 years', 11-14 years' and '>14 years'.

(9) *Education (time-constant covariate).* We are introducing the following variables to estimate the effect of husband's and wife's education, educational matches and educational gaps on the rate of divorce:

   a. *Educational attainment level.* We use information on the education of the first husband and wife's education at the time of first marriage. We distinguish seven educational degrees and attach the average number of years that are necessary to achieve them: Lower secondary school qualification without vocational training is equivalent to 9 years; middle school qualification is equivalent to 10 years; lower secondary school qualification with vocational training is equivalent to 11 years; middle school qualification with vocational training is equivalent to 12 years. Abitur is equivalent to 13 years; a professional college qualification is equivalent to 17 years; and a university degree is equivalent to 19 years.

   b. *Educational match (EduLev).* If we measure education in years, the differences between educational attainment levels are sometimes only one or two years of education. These fine-tuned differences are often not socially significant in Germany and cannot be used to identify significant upward and downward steps in terms of marriage. Rather than using finely measured years of education, we are distinguish only four socially important discrete educational attainment levels to model upward, downward and homogamous marriages: (1) lower secondary and intermediate schooling without vocational training, (2) lower secondary and intermediate schooling with vocational training or higher secondary schooling with and without vocational training, (3) professional college degree, and (4) university degree. Based on this scheme, we distinguish various dummy variables. We use the dummy variable 'Homogamous' to identify women who married a husband with the same education (according to our scheme), women who married a husband with another education are the reference category ('Heterogamous'). Furthermore, we use dummy variables to distinguish women who 'married educationally down', 'educationally homogamous (ref.)' and 'married educationally up'.

c. *Educational gap (EduGap).* The educational gap refers to the educational classification scheme with four hierarchical levels and can vary between 0 and 3, indicating the educational difference between the spouses.

Results

Descriptive Overview

Table 1 presents the absolute numbers and percentages of women who experienced a divorce of married up, down and homogamous women in Germany. The results show that the majority of women have married educationally homogamous (about 62 per cent), whereas about 25 per cent have married educationally up and about 13 per cent have married educationally down. In other words, women who have married educationally down are a minority in Germany. We anticipated that traditional marriages are most stable because they reflect a combination of benefits from communication and division of work. The stability of marriages of homogamous couples should rank in the middle, because they basically rely on benefits from communication. And, according to the doing gender model, downward marriages suffer from both, from small benefits from division of work and small benefits from communication. The descriptive results in Table 1 reveal that women's upward marriages are the most stable ones (about 14 per cent divorced), with homogamous marriages ranking second in stability (about 20 per cent divorced), followed by the least stable marriages, those where women married educationally down (about 26 per cent divorced). Hence, our hypotheses with regard to the stability of different educational matches are supported by the descriptive results.

[please include Table 1 about here]

Multivariate Longitudinal Analysis

Effects of Control Variables

We start our multivariate analysis with a rate model that includes the effects of important control variables in Table 2. We analyze all first marriages – regardless of whether women have married educationally up, down or lateral. This is the standard type of analysis in the literature. Because the effects of the control variables are very similar

across all following estimations, we will discuss the results of the control variables only here, but not for the remainder of the analyses.

[please include Table 2 about here]

First, in Model 1 of Table 2, we include eight time-dependent dummy variables for the duration of the first marriage as well as three time-constant dummy variables indicating the birth cohort of a woman. All coefficients of the dummy variables for the duration of marriage are negative and significant. They reveal a bell-shaped pattern of the rate of divorce of first marriage that initially increases, reaches a peak at about four to five years, and then decreases with marriage duration. Thus, our analysis supports the view that the divorce rate reflects an interplay of two contradicting forces, the initially increasing tendency to resolve mismatches and the rise of marriage-specific investments. In contrast, we do not find any significant effects for the birth cohorts which indicate that there is no cohort specific trend with regard to the risk of divorce for the successive birth cohorts.

In order to control whether the divorce risk differs for women born in East and West Germany and to control for period effects, we have included a dummy variable for the place of birth, a dummy variable for the historical periods as well as the interaction term 'East*Period after 1990' in Model 2 of Table 2. The estimates show that women born in East Germany are experiencing marital disruption earlier and more often than their West German counterparts, since the coefficient for the East German dummy variable is positive and significant. Additionally, the main coefficient for the historical period after German unification is insignificant and the divorce rate is therefore not significantly different from the period before German unification. However, the estimate of the interaction term 'East*Period after 1990' shows that women's rate of divorce of first marriage East Germany is significant and negative. If we compare the main and interaction effects then the divorce rate of women in East Germany is much higher than in West Germany before German unification and then drops below the West German rate after unification. This supports our hypothesis that there is a greater negative effect of German unification on the divorce of first marriage in East Germany than in West Germany. The estimates of the covariates introduced in Model 1 remain unchanged.

In Model 3 of Table 2, we control for premarital cohabitation, premarital birth, pregnancy at the time of marriage and early marriage by introducing four time-constant dummy variables into our analysis. We anticipated that

premarital cohabitation, premarital birth, pregnancy at marriage and early marriage should have a destabilizing effect on the marriage and therefore increase the risk of divorce. The results, however, do only support three of the four hypotheses. While the estimates for premarital cohabitation, premarital birth and early marriage are, as expected, significant and positive, there is no significant effect of pregnancy at the time of marriage. In other words, our analysis suggests that women who cohabit prior to marriage, women who have children out of wedlock and women who marry early are more prone to divorce. On the other hand, our analysis does not support the hypothesis of shot gun marriages on divorce in Germany.

In Model 4 of Table 2, age disparity between the spouses is included in our analysis using two dummy variables, indicating whether the wife is younger or older than her husband. If the husband is not more than two years older than his wife, we consider them of about the same age (reference category). The literature anticipated that age homogamy should stabilize a partnership and a greater age difference between the marital partners should be connected to a lower marital quality and stability. Our analysis shows that the divorce rate only increases if the wife is older than her husband (the coefficient is significant and positive).

In Model 5 of Table 2, we control for the effect of the age of the youngest child within a household on the divorce risk. We expected that children should stabilize a marriage but that there is a decline in marital stability with rising age of the youngest child within the household. The results are partly contrary to these hypotheses. Having very young children does not have any effect on the divorce risk compared to having no child at all. However, when children are older than three, there is a destabilizing effect on marriage and the divorce rate increases. If we control for the effect of children, the effect of the place of birth loses its significance. This means that it is the age of the youngest child rather than the place of birth that increases the risk of divorce in East Germany.

The Impact of the Educational Levels of the Spouses on Divorce

After having controlled for important influences on the divorce rate, we can now turn to our main research questions. We first test, whether the risk of divorce is affected by the educational attainment levels of the spouses. Most empirical divorce studies have concentrated their analysis only on the correlation between women's educational attainment level and the divorce risk, after controlling for other influences (see e.g. De Rose 1992;

Hoem 1997; Chan and Halpin 2005). We therefore include in Model 6 of Table 2 only the educational attainment level of the wife into our analysis. The literature expects that women's educational attainment level should have a destabilizing effect on marriages, since better educated women are increasingly independent from their partners and those marriages will have lower gains from specialization. Of course, the idea of the traditional marriage is guiding this type of analysis. Our results support this hypothesis, since the coefficient of wife's educational attainment level in Model 6 of Table 2 is positive and significant.

In order to study whether the divorce risk is decreasing with the educational attainment level of the husband, we include only the husband's educational level in Model7 of Table 2. According to the literature, the educational level of the husband should have a stabilizing effect on marriages since higher qualified husbands profit more from the division of work in a traditional marriage and women with a better educated husband have financially more to lose after a divorce (see e.g. Becker et al. 1977). Again, these models implicitly assume that all marriages are of a traditional kind. In Model 7 of Table 4, the effect of husband's educational attainment level is indeed negative and significant and therefore also supports this hypothesis.

Finally, in Model 8 of Table 2, we include husband's and wife's educational attainment levels simultaneously as it is done in some of the available divorce studies (see e.g. Rapp 2008; Bracher et al. 1993; Jalovaara 2001). Again, for all marriages, the traditional model is assumed. Our results show that there is the expected positive effect of wife's education and the expected negative effect of husband's education on divorce.

Effects of Educational Homogamy and Heterogamy on Divorce

The problem of the analysis of educational effects in Table 2 is that it does not take into account the relative educational resources of husbands and wives within particular marriages. In the next step we therefore test, whether the risk of divorce is affected by educational homogamy and heterogamy of the spouses. Most of the economic literature expects that educationally heterogamous couples would have more stable marriages due to specialization within marriage (negative assortative mating). After including our control variables of Table 2, we estimate the effect of a time-constant dummy variable for educationally heterogamous couples in Model 1 of Table 3 (homogamous couples are the reference category). Our analysis shows that there is no significant effect of

educational heterogamy on the divorce risk. This is not surprising because the sociological and economic literature also suggest a low divorce risk for homogamous couples since these couples profit from better and easier communication (positive assortative mating). In other words, there seems to be a trade-off between two different stabilizing effects of education in couples – the benefits from specialization in educationally heterogamous couples and the advantages of communication in educationally homogamous couples. Depending on the relative sizes of these positive influences of educational matches, empirical studies will report either a positive, a negative or no effect of educational heterogamy on the divorce risk.

[please include Table 3 about here]

In the next two steps, we therefore analyze how the stabilizing effect of communication in homogamous couples changes with the level of education (Table 4) and how the stabilizing effect of specialization in educationally heterogamous couples changes with the educational gap within couples (Table 5).

The Effect of the Level of Education on Divorce in Educationally Homogamous Marriages

In Table 4, we present the results of an analysis that only focuses on educationally homogamous couples. In other words, both partners in these marriages have the same educational attainment level. In these models, the control variables of Table 4 are included, but not reported again because the substantive effects are the same as in Table 4. The economic theory suggests that the advantage of the division of work within homogamous couples is close to zero ($W \sim 0$) because spouses are very similar. However, this theory also predicts that homogamous couples with higher education gain more from marriage than homogamous couples with lower education ($\Delta C > 0$) (Becker et al., 1977). We therefore expect that the educational level of spouses should have a negative effect on the divorce rate ($\alpha_1 \equiv - \Delta E_{lev} = - \Delta C$). Our estimates in Model 1 of Table 3 indeed support this hypothesis.

[please include Table 4 about here]

If we take the estimates from Model 1, then, based on our model, the estimated gains from communication are $\Delta\hat{C} = -\alpha_1 \rightarrow \Delta\hat{C} = 0.184$. The estimated benefits from communication for a couple with lower secondary and intermediate

schooling without vocational training (*EduLev* = 1) are $\hat{C}_1 = 1 * 0.184 = 0.184$ and for a couple with university degree (*EduLev* = 4) are $\hat{C}_4 = 4 * 0.184 = 0.736$.

The Effect of Educational Gaps on Divorce in Educationally Heterogamous Marriages

Table 5 shows the results of an analysis that only includes educationally heterogamous marriages – regardless of whether women have married educationally up or down. Again, the control variables of Table 4 are included but not reported. According to the economic theory of the family, the educational gap between the spouses should have a negative effect on the divorce risk due to higher gains from specialization. In other words, the bigger the educational gap between the spouses, the more stable the marriage and the lower the risk of divorce. The results of Model 1 in Table 5 seem to support this hypothesis, since the coefficients are negative and significant. However, this model assumes that the effects of the educational gap on divorce are the same regardless of whether women have married educationally up or down. Of course, this is a strong assumption and will be tested by analyzing women's upward (see Table 7) and downward (see Table 8) marriages separately further below.

[please include Table 5 about here]

The Impact of Upward, Homogamous and Downward Marriages on Divorce

In the next step, we estimate the effects of the relative education within couples depending on whether women married up, homogamous or down in Model 1 of Table 6 in addition to our control variables. We expect that traditional marriages are most stable because they reflect a combination of gains from communication and division of work. The stability of marriages of homogamous couples should rank in the middle, because they mainly rely on gains from communication. If the doing gender model is right, downward marriages suffer from both, from insufficient gains from division of work and lower gains from communication. In addition, according to this theory, these couples are exposed to a higher pressure from their social networks, because they violate gender norms. If the economic theory of the family is right, then there should be a role reversal among husband and wife and the marriage should be as stable as a traditional one. This means that these downward marriages should be more stable

than homogamous marriages. Our results clearly support the doing gender model and reject the hypothesis of the economic theory of the family. Married down women clearly have the highest divorce risk because they violate gender norms and provide low gains from division of work and communication. As expected, traditional marriages are more stable than homogamous marriages because they enjoy gains from division of work and some gains from communication. Homogamous marriages have a moderate divorce rate, because they cannot rely on grains from division of work but mainly on gains from communication.

[please include Table 6 about here]

The Impact of Spouses' Educational Attainment Levels and Spouses' Educational Gap on Divorce for Married Up Women

Since women's upward and downward marriages have a different impact on divorce, we study the impact of husband's and wife's educational attainment level on these two particular matches separately in more detail. We begin with first marriages where women have married educationally up and include all control variables without reporting them. This is the traditional marriage setting. We first include women's education into Model 1 of Table 7. There is no significant effect. Then we include only husband's education into Model 2 of Table 7 and also find no significant effect. This is not surprising, because according to the economic theory of the family, only the relative educational resources are important for the stability of the marriage. In other words, the larger the educational gap within couples, the greater the gains from specialization and the lower the divorce risk. In Model 3 and 4 of Table 7, we estimate the impact of the educational gap between the spouses on the divorce rate of traditional couples. As suggested by the economic theory of the family, there is a strong significantly negative effect of the educational gap within the couple. In other words, the economic theory is indeed correct, as long as we analyze traditional couples. If women's better education and their ability to turn their educational investments into career gains reduces the educational gap between the spouses in traditional marriages, this leads to an increase in the divorce rate. However, only under these very specific circumstances the divorce risk is increased.

[please include Table 7 about here]

Based on our theoretical model, we are now able to estimate the gains from division of work. We have an estimate for the coefficient of the educational gap ($\Delta\hat{E}_{gap}$ = -0.604) and, based on Model 4 of Table 6, we have an estimate for the gains from communication $\Delta\hat{C}$ = 0.184. Thus, an estimate of the gains from division of work ($\Delta\hat{W}$ = - 0.788) can be computed based on the following equation -0.604 = $\Delta\hat{W}$ + 0.184. If we now compare two traditional couples, one with a big educational gap with large benefits from division of work (W_1) and small benefits from communication (C_1) and one with a smaller educational gap with smaller benefits from division of work (W_2) and larger benefits from communication (C_2) ($W_1 > W_2$ and $C_1 < C_2$), we expected, based on the economic theory of the family, $-\Delta W = W_2 - W_1$ and $\Delta C = C_2 - C_1$. In other words, economists predicted that in absolute terms the losses from negative assortative mating resulting from individual differences in human capital and specialization are greater than the gains from communication ($|-\Delta W| > |\Delta C|$). Our estimates indeed demonstrate that this is the case: (|-0.788| > |0.184|). In traditional marriages, the gains from division of work are indeed a strong stabilizing factor that reduces the divorce rate.

The Impact of Spouses' Educational Attainment Levels and Spouses' Educational Gap on Divorce for Married Down Women

In Table 10, we present the results of our analysis which includes all first marriages, where women have married educationally downward. In the theoretical section, we have discussed several competing hypotheses. The gender-neutral economic theory of the family assumes that changes for wives and husbands are always symmetric. In other words, gender roles within couples are assumed to be simply reversible. Therefore, the larger the educational gap within these non-traditional couples, the greater the gains from specialization and the lower the divorce risk. In fact, the impact of the educational gap should be the same as in Table 7 (-0.650). However, if we embed the doing gender theory into our division of work/communication framework, several other predications of the impact of the educational gender gap in non-traditional couples on divorce are possible: (1) if the increasing educational gap is not only connected with increasing losses of gains from communication but also increasing losses from gains of division of work (because the husband does not participate in housework at all), the divorce rate should rise with the increase in the educational gap; (2) if the change in the gains of the educational gap is only determined by the losses of gains from communication, because the contribution of the husband to housework is small but constant across all

educational levels, then the effect of the education gap in non-traditional marriages on divorce should be small but positive; and (3) if the gains from the division of work are more or less equal to the losses in the gains from communication, then the gains from the educational gap are close to zero and the effect of the educational gap on the divorce rate should not be statistically significant.

Table 8 shows, after taking into account the control variables, that neither the educational level of the wife (Model 1) nor the educational level of the husband (Model 2) nor the educational gap between the spouses (Models 3 & 4) have any significant effect on the divorce rate. In other words, this result speaks against the economic theory of the family and in favor of the third explanation of the doing gender approach. Hence, the gains from husband's contribution to housework seem to compensate more or less the losses from communication: ($|-\Delta W| = |\Delta C|$). For non-traditional couples we can therefore estimate the gains from division of work as $|\Delta \hat{W}|=|-0.287|$.

[please include Table 8 about here]

Our results clearly demonstrate that we have to disaggregate the marriages of women into upward, downward and homogamous marriages since we would otherwise mix-up different effects of the educational gap on the divorce rate.

The Divorce Rate of Women With a University Degree Who Married Educationally Downward or Homogamous

In the course of educational expansion, women gained more than men, so that women began to surpass men's educational attainment level in Germany in the early 2000s. In particular, women have significantly higher university graduation rates than their male counterparts in Germany today. Thus, the group of young females, which is of special interest today, are women with university degree. These women do not only face a ceiling effect when it comes to partner selection (since they cannot marry educationally upward), but they are also increasingly forced to stay single or to marry educationally down, because there are increasingly fewer male partners available at the same educational level in a certain age range. In addition, some of the young male university graduates still marry traditionally and are not available as possible partners for academically educated women (Blossfeld & Timm 1997). Thus, the question arises whether there is a "success" penalty in terms of a higher divorce rate for highly educated married down women? In Model 1 of Table 9, we include husband's education as well as a dummy variable for

downward marriages (homogamous marriages are the reference category) in addition to the control variables from Table 2. There is no significant effect for the educational attainment level of the husband. In other words, the divorce rate does not depend on the educational attainment level of the male partner in these marriages. However, women's downward marriages are less stable than homogamous ones, since the coefficient is significant and positive. This result underlines, again, the doing gender theory. If academically educated women are married to less educated men, they are still socially accountable in Germany, risk negative judgements from friends, relatives and colleagues and, to some extent, threat their gender identities (West and Zimmermann 1987; Fenstermaker et al. 1991). These circumstances reduce the probability of a satisfactory marriage and increase the proneness to divorce.

[please include Table 9 about here]

Figure 2 shows the estimated survivor functions (based on Model 1 of Table 9) for both, academic women who married educationally homogamous and down. It is easy to see that marriages, where highly educated women have married educationally down are much less stable and divorced quicker and more often than marriages among university graduates. After 20 years of marriage, only 3 per cent of the educationally homogamous marriages are divorced, whereas it is about 14 per cent of the marriages where female university graduates have married educationally downward. At first glance, this is a huge penalty for highly educated married down women. However, if we compare this divorce rate with the average divorce rate in East (20.8 per cent) and West Germany (18.2 per cent), then married down women with university degree have still more stable marriages. In addition, as Table 1 shows, highly educated married down women have a lower divorce rate than the average woman who marries educationally down (26.2 per cent) or homogamous (19.3 per cent) and is normally lower educated. Finally, if we compare the divorce rate of highly educated married down women (about 14 per cent after 20 years) in Fig. 1 with the average divorce rate of married up women in Table 1 (13.9 per cent), then their divorce rates are pretty much the same. The conclusion therefore is that highly educated women are not penalized, in terms of higher divorce rates, compared to lower educated women. There is only a disadvantage with regard to the academically educated women who married an equally educated partner.

[please include Fig. 1 about here]

Summary and Conclusion

In this paper, we investigated the impact of educational assortative mating on divorce. So far, most empirical studies have concentrated their analysis on: (1) the correlation between women's educational attainment level and divorce risk (after controlling for other influences); (2) the net association of divorce rates with the education of both spouses; and (3) the marital stability of homogamous and heterogamous marriages. The literature reported contradictory effects of husband's and wife's education on divorce. The present study was done in an attempt to clarify the discrepancies in these earlier studies, which are unlikely to be explained only by national differences. We developed a theoretical model and identified three problems of earlier studies: (1) there is the issue that some of the work only estimates the effects of husband's and wife's education on divorce without taking into account the relative educational resources of husbands and wives within particular marriages. However, the literature is quite clear that it is particular the relative educational resources that are important for the divorce rate. (2) Most of the divorce studies analyzed all kinds of marriages as if they were traditional ones and studied the disrupting effect of the declining benefits of the division of work when women's educational attainment level has been increasing. However, based on our theoretical discussion, there are not only benefits from division of work but also benefits from communication within a couple. In our work, we therefore analyzed the combined gains and losses of division of work and communication. (3) The available divorce studies assumed that the effects of the educational gap within couples on divorce are the same regardless of whether women have married educationally up, homogamous or down. Our analysis clearly demonstrated that the effects of husband's and wife's education have a different impact on these different educational matches.

In summarizing the results of our empirical analysis, we would like to stress the following effects of husband's and wife's education on divorce: (1) If women married up, wife's and husband's education as such have no effect, only the educational gap within couples is important for the divorce rate. Our estimates support the economic theory of the family that the losses from decreasing specialization are greater than the gains from better communication. Thus, if women are better educated and increase their income potential relative to their husbands, this increases the losses from specialization more than the gains from better communication within the traditional marriage and therefore increases the risk of divorce. (2) In homogamous marriages, where the benefits from division of work are close to zero, the benefits from communication have indeed a stabilizing impact on divorce. The economic and sociological theories are also right, if they anticipate that homogamous couples with a higher educational attainment level gain

more from this kind of marriage than homogamous couples with lower educational level. (3) If women married down, neither the educational level of the wife nor the educational level of the husband nor the educational gap between the spouses have any effect on the divorce rate. This clearly contradicts the gender-neutral economic theory of the family, which assumes that the changes for wives and husbands are always symmetric and that there are always gains from the division of work. Instead, our results support the doing gender approach, which stresses the importance of the gender dimension and predicts that if females are better educated than their male partners, they are socially accountable and risk negative judgements from friends, relatives and colleagues. These non-traditional couples are therefore very likely to compensate this deviation from the norm by adopting traditional gender behavior elsewhere. Thus, the less educated husband does not engage in housework and his wife increasingly has to struggle with a double burden, one at home and one at work. That this is indeed still the case in Germany is shown by empirical studies investigating the division of work of husbands and wives with longitudinal data (Schulz and Blossfeld 2009). Our estimates suggest that, if the educational gap within non-traditional couples is increasing, the gains from husband's contribution to housework in non-traditional marriages are more or less as large as the losses from communication, so we do not find any effect of the educational gap on the divorce rate in non-traditional marriages. (4) When we compare the stability of upward, homogamous and downward marriages, women's upward marriages are the most stable ones, with homogamous marriages ranking second in stability, followed by the least stable marriages, those where women married educationally down. (5) At the end of our analysis, we estimated the divorce rate of a particularly interesting group of females: women with university degree. Our analysis of a "success" penalty in terms of a higher divorce rate for these highly educated married down women revealed that there is no such penalty for the best educated women. Even if the divorce rate of these women is much higher than for academic women who are married to an equally educated partner, the divorce rate is lower than for most of the women who have a lower educational attainment level and marry either educationally up, homogamous or down. In addition, one would expect that with women's increasing downward marriages, this kind of marriages will be increasingly less stigmatized and socially accepted, so that also the divorce rates of academically homogamous and married down women can be expected to gradually converge in the future.

Based on our quite differentiated theoretical model of the impact of husbands' and wives' education on divorce, we were able to gain a better theoretical understanding of the divorce process and could give a more clear-cut interpretation of the estimation effects of education on divorce. Of course, our analytical distinction between the

effects of the communication and economic dimensions of education on divorce was based on limited proxy variables. Thus, we would hope that if better longitudinal measurements of the various dimensions of education are available, the analysis of the divorce process could be further improved.

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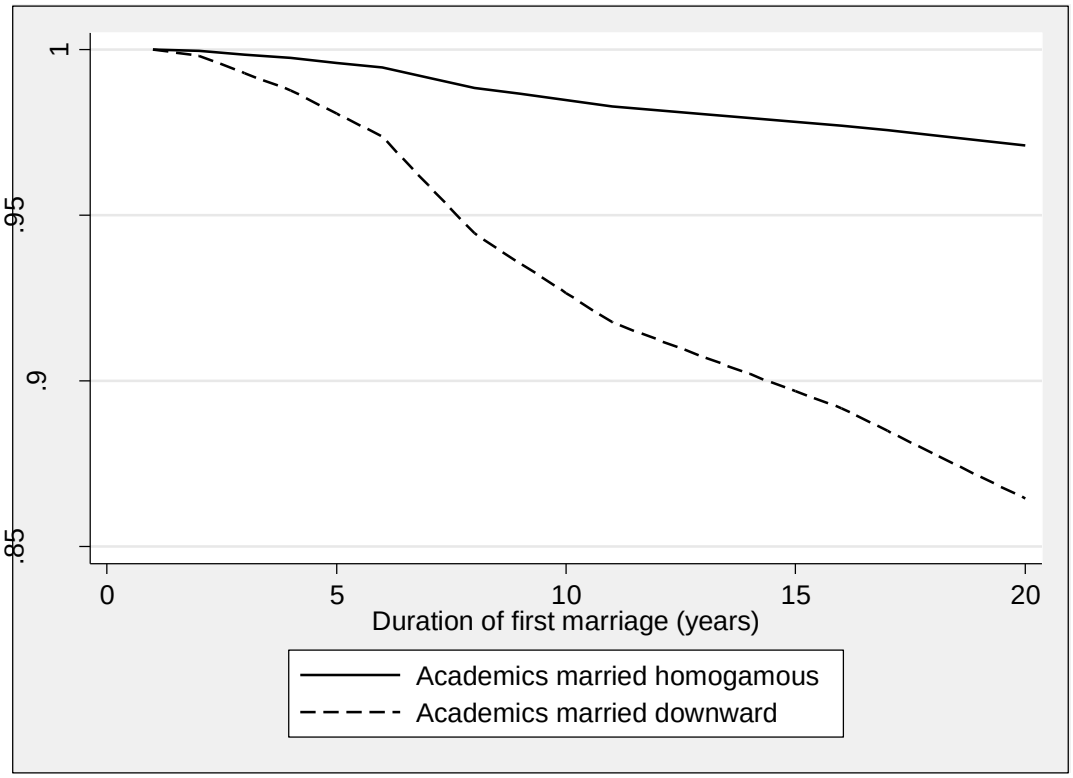
Figures

Fig. 1: Survivor functions for married women with university degree who married educationally homogamous and downward



Source: Estimations based on NEPS data from the adult study

Tables

Table 1: Women's divorce of first marriage for women who married educationally down, homogamous and up

Women who married educationally	**No Divorce**	**Divorce**	**Total**
…down	360	128	488
	73.8	26.2	100.0
…homogamous	1,991	475	2,466
	80.7	19.3	100.0
…up	854	138	992
	86.1	13.9	100.0
Total	3,205	741	3,946
	81.2	18.8	100.0

Source: Estimations based on NEPS data from the adult study

Table 2: Effects of control variables and husband's and wife's education on the divorce rate (only women's first marriage)

Variables	Model 1	2	3	4	5	6	7	8
Duration (years)								
0-1	-9.089***	-9.235***	-9.639***	-9.681***	-9.642***	-8.624***	-10.290***	-9.413***
2-3	-7.138***	-7.266***	-7.671***	-7.713***	-7.701***	-6.683***	-8.348***	-7.468***
4-5	-6.699***	-6.806***	-7.209***	-7.250***	-7.318***	-6.300***	-7.963***	-7.080***
6-7	-6.806***	-6.894***	-7.294***	-7.333***	-7.512***	-6.494***	-8.155***	-7.269***
8-10	-6.893***	-6.955***	-7.354***	-7.390***	-7.722***	-6.704***	-8.361***	-7.468***
11-15	-7.123***	-7.142***	-7.542***	-7.574***	-8.063***	-7.043***	-8.698***	-7.795***
16-20	-7.096***	-7.054***	-7.457***	-7.484***	-8.021***	-7.002***	-8.652***	-7.742***
20+	-7.552***	-7.403***	-7.826***	-7.844***	-8.282***	-7.265***	-8.904***	-7.985***
Birth cohort								
1944-1950 (ref.)								
1951-1960	-0.020	0.073	-0.083	-0.081	-0.069	-0.081	-0.079	-0.110
1961-1970	0.006	0.244	0.043	0.061	0.064	0.044	0.063	0.028
1971-1980	-0.406	-0.093	-0.329	-0.286	-0.244	-0.286	-0.234	-0.294
Place of birth								
West (ref.)								
East		0.350**	0.276*	0.263*	0.209	0.266	0.159	0.198
Historical period								
Period until 1990 (ref.)								
Period after 1990		-0.192	-0.143	-0.161	-0.210	-0.185	-0.235	-0.224
East*Period after 1990		-0.517**	-0.573**	-0.566**	-0.514**	-0.532**	-0.511**	-0.542**
Premarital cohabitation, birth and pregnancy								
Women's premarital cohabitation			0.512***	0.507***	0.513***	0.531***	0.505***	0.516***
Women's pregnancy at marriage			0.066	0.062	-0.038	-0.050	-0.037	-0.052
Women's premarital birth			0.402***	0.389***	0.207	0.135	0.257	0.206
Early and late marriage								
Early marriage			0.366***	0.402***	0.418***	0.301**	0.499***	0.396***
Late marriage (ref.)								
Age disparity between the spouses								
Wife older than husband				0.265*	0.258*	0.223*	0.275*	0.239*
Wife and husband are of the same age (ref.)								
Wife younger than husband				-0.015	-0.011	-0.008	-0.011	-0.011
Age youngest child (years)								
No child (ref.)								
<1					-0.209	-0.210	-0.210	-0.214
1-2					0.247	0.246	0.248	0.240
3-5					0.689***	0.684***	0.692***	0.679***
6-10					0.635***	0.624***	0.641***	0.620***
11-14					0.789***	0.772***	0.798***	0.770***
>14					0.499*	0.475*	0.514**	0.478*
Education								
Education of wife at first marriage						0.049**		0.106***
Education of first husband							-0.075***	-0.120***
Log likelihood	-5,981.97	-5,973.19	-5,942.33	-5,939.60	-5,918.66	-5,914.11	-5,907.07	-5,890.05
Number of events	741	741	741	741	741	741	741	741

Number of sub-episodes	953,462	953,462	953,462	953,462	953,462	953,462	953,462	953,462
Chi^2	37,236.15	37,130.52	36,754.86	36,722.17	36,720.83	36,416.72	36,329.74	36,126.52
Degrees of freedom	11	14	18	20	21	27	27	28

Note: *p<.05; *p<.01; ***p<.001; n=3,946
Source: Estimations based on NEPS data from the adult study

Table 3: The effects of educationally homogamous and heterogamous marriages on the divorce of first marriage

Variables	**1**
Control variables (see Table 4)	
...	
Relative education of spouses	
Heterogamous	-0.040
Homogamous (ref.)	
Log likelihood	-5,918.53
Number of events	741
Number of sub-episodes	953,462
Chi^2	36,470.19
Degrees of freedom	27

Note: *p<.05; *p<.01; ***p<.001; n=3,946
Source: Estimations based on NEPS data from the adult study

Table 4: Effect of couple's educational attainment level on the divorce rate for homogamous couples

Variables	**Model 1**
Control variables (see Table 4)	
...	
Educational match	
Education of the spouses at first marriage	-0.184*
Log likelihood	-3,796.80
Number of events	475
Number of sub-episodes	603,613
Chi^2	23,339.67
Degrees of freedom	27

Note: *p<.05; *p<.01; ***p<.001; n=2,466
Source: Estimations based on NEPS data from the adult study

Table 5: Effect of couple's educational gap on the divorce rate for heterogamous couples

Variables	**Model**
	1
Control variables (see Table 4)	
...	
Education	
Education gap between the spouses	-0.447**
Log likelihood	-2,108.55
Number of events	266
Number of sub-episodes	349,849
Chi^2	12,969.24
Degrees of freedom	27

Note: *p<.05; *p<.01; ***p<.001; n=1,480
Source: Estimations based on NEPS data from the adult study

Table 6: Effects of women's upward, downward and homogamous marriage on the divorce rate (only first marriages)

Variables	**1**
Control variables (see Table 4)	
...	
Educational match	
Wife married down	0.526***
Wife married homogamous (ref.)	
Wife married up	-0.381***
Log likelihood	-5,892.82
Number of events	741
Number of sub-episodes	953,462
Chi^2	36,162.14
Degrees of freedom	28

Note: *p<.05; *p<.01; ***p<.001; n=3,946
Source: Estimations based on NEPS data from the adult study

Table 7: Effects of husband's and wife's education on divorce for married up women

Variables	Model			
	1	2	3	4
Control variables (see Table 4)				
...				
Education				
Education of wife at first marriage	0.062			0.091
Education of first husband		-0.012		-0.010
Educational match				
Educational gap			-0.565*	-0.604*
Log likelihood	-1,123.03	-1,124.24	-1,120.90	-1,118.88
Number of events	138	138	138	138
Number of sub-episodes	241,283	241,283	241,283	241,283
Chi^2	7,216.93	7,232.24	7,189.23	7,163.20
Degrees of freedom	26	26	26	28

Note: *p<.05; *p<.01; ***p<.001; n=992
Source: Estimations based on NEPS data from the adult study

Table 8: Effects of husband's and wife's education on divorce for married down women

Variables	**Model**			
	1	**2**	**3**	**4**
Control variables (see Table 4)				
...				
Education				
Education of wife at first marriage	-0.067			0.005
Education of first husband		-0.073		-0.076
Education gap between the spouses			-0.190	-0.204
Log likelihood	-948.80	-948.68	-950.08	-948.26
Number of events	128	128	128	128
Number of sub-episodes	96,862	96,862	96,862	96,862
Chi^2	5,303.24	5,301.87	5,317.18	5,390.73
Degrees of freedom	27	27	27	29

Note: *p<.05; *p<.01; ***p<.001; n=488
Source: Estimations based on NEPS data from the adult study

Table 9: Effects of husband's education and women's downward and homogamous marriage on divorce for women with university degree

Variables	Model 1
Control variables (see Table 4)	
...	
Education	
Education of first husband	0.090
Educational match	
Wife married down	1.599***
Wife married homogamous (ref.)	
Log likelihood	-537.88
Number of events	70
Number of sub-episodes	93,272
Chi^2	3,186.67
Degrees of freedom	27

Note: *p<.05; *p<.01; ***p<.001; n=101
Source: Estimations based on NEPS data from the adult study