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Education, Work and Family Events in Women's Lives

Long-Term Developments and Recent Trends in East and West Germany

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"Modern Marriage. The grey mare is the better horse."

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ABSTRACT

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This thesis investigates how educational expansion, the trend towards the service society and the German unification affect East and West German women's life courses and family lives. It focuses on educational enrolment, educational attainment level, labour force participation, career resources, social origin, the educational match among partners as well as historical periods and examines their consequences on women's entry into first motherhood as well as partnership formation and dissolution processes. Using longitudinal data from the National Educational Panel Study (NEPS), we have applied multivariate methods such as event history analysis. The findings suggest that women's entry into motherhood during full-time education is highly dependent on women's age, social origin and the policy measures in a country. Furthermore, women's education has mainly an effect on the time structure of entry into first motherhood over the life course of differently qualified women but not on their final decision to enter into motherhood. Only if higher educated women can turn their educational investments into career resources, there is an effect on childlessness. This thesis also looked into women's partnership formation and dissolution processes. East and West German women do only differ slightly with regard to these transitions; nevertheless, the results showed that it is mainly West German women that transform their partnerships if they experience a pregnancy. Furthermore, the transmission of norms within a family seems to play an important role in women's partnership formation and dissolution processes. Based on a new theoretical model on educational assortative mating and divorce, this thesis is able to 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 married down marriages being the least stable ones.

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1 Introduction

Today, an individual's life consists of several life domains such as education, family, and work. These domains are dynamically linked with each other and embedded into a nationally specific institutional and historical context. Important life course decisions are often not taken in isolation, but are part of a more complex interdependence of developments in several life domains (Mayer, 1990; Willekens, 1999). Status changes in one of these life domains and changes in the historical macro processes may initiate, delay, enable, accelerate or prevent status changes in a life domain of interest. In life course research, these status changes are called events (Mayer & Tuma, 1990). Family life events are central to the lives of individuals and, in particular to the life cycle of women. For example, a family event can be becoming a parent, getting married or having a divorce. In this study, we focus on East and West German women's family events over the life course in dependence of their educational participation and labour force experience before and after German unification.

In recent decades, the dynamics of family life in modern societies have undergone remarkable changes. These changes can be described by demographic transformations such as declining fertility, rising ages at first birth and first marriage as well as changing divorce rates (Calot, 1998; Frejka & Calot, 2001; 2004). They are closely connected with structural macro developments such as educational expansion and the trend towards the service economy in modern societies. They are also associated with unprecedented shifts in social norms and values defining the employment and family roles of men and women in advanced industrial societies in new ways (Beck & Beck-Gernsheim, 2002; Giddens, 1991; Grunow, Aisenbrey & Evertsson, 2011; Lesthaeghe & Surkyn, 1988; Mayer & Huninink, 1990). In addition to these more general trends, Germany has experienced a particular development by the separation into a socialist and a capitalist state after World War II and the reunification of Germany after the fall of the Wall. These specific histori-

cal events have resulted in unusual turbulences and unexpected continuities in the transformation of life courses, particularly in East Germany (Diewald, Goedicke & Mayer, 2006; Mayer, 1990).

An important change for family events has been the educational expansion that was accompanied by a lengthening of the time spent in education (Mayer, 1990). Over successive generations, the educational attainment level, particularly of women, has risen significantly (Blossfeld & Blossfeld, 2014; Breen, Luijkx, Müller & Pollak 2009; 2010; Shavit & Blossfeld, 1993). In Germany, young women have now even surpassed young men among upper secondary school graduates (Abitur) and university freshmen (Authoring Group Bildungsberichterstattung, 2010; 2012; 2014). In addition to women's higher educational investments, there has been a market trend towards upskilling and tertiarization of the occupational structure (Gallie, White, Cheng & Tomlinson, 1998; Mayer & Solga, 2008). Together, these changes have not only increased the female labour force participation but have also provided better career opportunities for women across birth cohorts. Thus, younger women have not only higher educational attainment levels and increasing rates of participation in paid work but they also have higher-quality jobs than their mothers and grandmothers (Mayer, 1990; Mayer & Huinink, 1990).

From a life course perspective, increasing educational attainment across birth cohorts is not only connected with a gradual extension of educational participation for young qualified adults but also with a growing conflict between full-time educational activities and women's family roles. Thus, increasing educational participation often leads to a delay of women's entry into first marriage and first birth, in particular for highly qualified women. In addition, women's increasing educational investments are associated with a higher female labour force participation and, in the German normative and institutional context, with severe problems to balance family and professional responsibilities

(Grunow, 2013). Of course, there have also been great differences between the lives of East and West German women since the socialist state in East Germany supported women's full-time employment and provided extensive child care while the West German welfare state privileged the more traditional 'male breadwinner marriage' and the marriage of a 'male breadwinner with a female secondary earner' through tax incentives and only moderate childcare provision (Obertreis, 1986; Trappe, 1995; Trappe & Rosenfeld, 2000). After the German unification, the West German institutional structure was introduced in East Germany, but these different female life course models seem to converge only very slowly (Diewald, Geodecke & Mayer, 2006).

There are many life course studies analysing these changing relationships between education, labour force participation and family events from the 1980s to the early 2000s. What is clearly missing is an analysis of the most recent developments. Using the German "National Educational Panel Study" (NEPS), we are able not only to analyse longer timespans before and after unification in East and West Germany but also the most recent development in the unified Germany.

To introduce into the topic and research questions of this thesis, we have structured this chapter as follows. Sections 1.1 introduces into the aims of this thesis and section 1.2 gives an outline of the structure of the thesis. Section 1.3 provides an overview of the life course perspective and its five general principles. Section 1.4 relates long-term historical developments of the roles of women in Germany, their particular changes in the socialist East and the capitalist West as well as the developments after German unification to the following three family outcomes: first motherhood, first cohabitation and marriage as well as first divorce. Section 1.5, 1.6 and 1.7 give an overview of the advantages of the longitudinal approach that this thesis adopts and describes the properties of the data from the NEPS sample in this analysis as well as the longitudinal methods that have been used.

1.1 Contributions of the Thesis

The overall aim of this thesis is to make significant theoretical and empirical contributions to the growing literature on the interdependence of education, work and family events in women's life courses in Germany, and, more generally, to the field of family sociology. There are seven innovative descriptive and analytical contributions.

First, in the literature on Germany today, there is no comprehensive long-term historical description of the specifities of the family development in Germany over the last two centuries that would also embrace the most recent changes before and after the German unification and that compares different family events such as union formation processes, fertility behaviour and divorce in East and West Germany. We therefore describe in detail the long-term development and the most recent trend in family formation and dissolution processes in East and West Germany.

Second, a descriptive analysis of the sequences of partnership states and their relationship to fertility events over the early life course of women in successive birth cohorts in East and West Germany has been missing. Using novel longitudinal data, we therefore follow up women's sequences of different partnership states over the early life course across birth cohorts in East and West Germany as well as the whole of Germany. We also describe the change in the timing of entry into marriage over the life course for different birth cohorts in both parts of Germany. Finally, we focus on women's partnership status at first birth and the proportion of childless women across successive birth cohorts in East and West Germany.

Third, previous research on Germany mainly focused on women's entry into marriage (Strohmeier, 1993; Wagner & Franzmann, 2000) and there have only been very few attempts to analyse competing forms of living arrangements such as first cohabitation and first marriage in East and West Germany using longitudinal data (Brüderl, 2004; Nazio,

2008). As we will show in Section 1.4, both Germanies experienced an increase in the age at first marriage along with a decline in marriage rates. Despite this delay in entry into marriage, young adults continue to set up households with partners (Konietzka & Kreyenfeld, 2005; Nazio, 2008). In fact, there has been a rapid rise of cohabitation, especially for young couples. We therefore study the impact of place and time, macro-structural insecurity, education and the birth of children on single women's entry into first cohabitation or first marriage as competing events in East and West Germany.

Fourth, very little is known about the extent to which cohabitations are transformed into marriages in the later life course in East and West Germany. Therefore, we examine the differences in the duration of cohabitation and study the effects of various life course constellations on the transition from cohabitation to marriage in East and West Germany. In the literature, two different meanings of cohabitation are usually distinguished (Manting, 1994; Mills, 2000; Kiernan, 2000; Wu, 2000): (1) cohabitation as a trial arrangement or a stage in the marriage process, and (2) cohabitation as a more or less permanent alternative to marriage. In East and West Germany, the diffusion of cohabitation has been very similar (see Figure 1.4 and Figure 1.5: 38). Nevertheless, in the literature the socialist and capitalist German regimes are often supposed to have a different impact on the meaning of cohabitation (Höhn et al., 1990). In the FRG, cohabitation has always merely been a stage in the marriage process until children are expected, so that the great majority of children were born within a marriage (Nave-Herz, 2004; Simm, 1991; Tölke, 1993; Vaskovics & Rupp 1995). As a result, West Germany is characterized by a high proportion of couples who decide to enter into a marriage during pregnancy (Blossfeld & Mills, 2002). In contrast, the GDR offered generous financial and institutional support to single and cohabiting mothers, so that more and more young couples decided to opt for cohabitation rather than marriage (Gysi, 1989; Höhn et al., 1990). As a result, parenting depended less on marriage in the former GDR. In this thesis, we therefore study to which extend the mean-

ing of cohabitation was indeed different in East and West Germany before the German unification and how this meaning has changed in both parts of Germany after the fall of the Wall, in particular in relation to the birth of children.

Fifth, previous research has mainly analysed women's educational assortative mating with regard to entry into marriage (Blossfeld, 2009; Blossfeld & Timm, 2003; Klein, 1997; Schwartz & Mare, 2005; Teckenberg, 1991, 2000; Wirth, 1996, 2000). An analysis of women's educational assortative mating with regard to entry into cohabitation is missing. Furthermore, there has been no research on the effects of mothers' role models on daughters' union formation processes. Since mothers might act as role models for their daughters, this increases the likelihood that their daughters will also adopt a similar role as their mothers within their own partnership (Rosenthal, 1985; Beaman, Duflo, Pande & Topalova, 2012). Farré and Vella (2013) find that mothers with less traditional views about the role of women in society are more likely to have daughters without these traditional views. In other words, if mothers live less traditional, their daughters are also very likely to live accordingly. In this thesis, we therefore examine the impact of mother's role model on daughter's educational assortative mating. We distinguish three educational matches for the partnerships of the two generations: (1) the female has a higher education than the male partner; (2) the female has the same education as the male partner; and (3) the female has a lower education than the male partner.

Sixth, in the process of educational expansion, a rising number of young women participates increasingly longer in the educational system across cohorts (Huinink & Wagner, 1995). Life course studies indicate that normative sequences exist with regard to various life course transitions such as women ought to first finish school before they start their own family. In order to satisfy this sequencing norm, young women will therefore postpone their entry into motherhood until they have completed their education (Hogan,

1978; Marini, 1984; Settersten & Mayer, 1997). However, if young women postpone motherhood because they are still enrolled in education, they might get under pressure because there also exist normative expectations regarding the timing of motherhood (Hogan, 1978; Yamaguchi, 1991). Some female students may consider the violation of the sequencing norm as less undesirable than the violation of the age norm and therefore get their first child while they are still participating in full-time education. The decision to have a first child while in education is primarily dependent on the degree to which motherhood disrupts the educational success. In the mid-1970, the GDR introduced significant pronatalist family measures to reduce the conflict between full-time education and motherhood in order to increase the fertility level. For example, mothers in education had a privileged housing access, were offered daylong free childcare and received additional financial benefits. With the fall of the German Wall, these kinds of pronatalist policies were abolished abruptly. In the Eastern part of Germany, this has suddenly increased the conflict between educational participation and motherhood for young women. In this thesis, we conduct a difference-in-differences analysis of the effects of changing state support for mothers in education before and after unification in East Germany and compare these changes with the developments in West Germany. The aim of this analysis is to study whether pronatalist policies can indeed increase the fertility of women who are in full-time education. We conduct also a more specific longitudinal analysis to make sure that the outcome of the difference-in-differences analysis represents the consequence of a specific policy change in the transition from the GDR to the united Germany for woman enrolled in education and not the more general changes in the society as a whole connected with German unification.

Seventh, with increasing educational investments in the course of the educational expansion women's labour force participation over the life course has strongly risen and women in East and West Germany are also more and more able to turn their educational

investments into career gains. Since women in Germany, in particular in West Germany, are normatively expected to first finish school before they start a family, they often postpone their entry into motherhood until they have finished education. East and West Germany are still characterized by a gender-specific division of work in the family. Within couples, it is therefore typically the mother's time which is the major part of the total cost of child care and rearing children. Hence, women who are employed are facing a double-burden and are having difficulties to reconcile family and work demands. If women raise their value of time by greater educational investments and increased career resources this leads to higher income opportunities and increases the relative costs of children. They will therefore tend to postpone their entry into motherhood or decide to remain childless. Nevertheless, there might be differences in women's decision to enter into motherhood with regard to their employment form (part-time vs. full-time) and their type of labour contract (temporary vs. permanent). However, not all women are able to turn their human capital investments into career resources, because they do not work or do not find a job and might therefore enter into motherhood more often than employed women. Women's decision to have a first child is also dependent on the degree to which women can reconcile their family demands and job careers. In the socialist GDR, women were completely integrated into the labour market, based on secure, permanent, full-time work. At the same time, pronatalist family measures in the GDR supported mothers in terms of extensive parental leave, daylong childcare as well as financial benefits (Huinink & Wagner, 1995; Trappe, 1995; 1996). This eased the conflict between family and work demands. In contrast to the GDR, the FRG always considered childcare predominantly a private matter, based on the traditional model of the male breadwinner and the female homemaker. Many West German women were therefore not working at all, and if they did, they were mainly employed as part-time workers. With the fall of the German Wall, East German women were facing a sudden high level of uncertainty and the family policies were re-

duced abruptly which has suddenly increased their conflict between labour market participation and motherhood. In the sociological literature, little attention has been paid on the impact of educational enrolment, educational attainment level, labour force participation and career advancement on women's decision to have a first child in East and West Germany before and, especially, after the German unification. We therefore examine in detail the impact of educational enrolment, educational attainment level, labour force participation and career advancement on women's decision to have a first child in East and West Germany before and after the German unification. In particular, we want to clarify to which extent these patterns for the younger generations of women today are still similar to the patterns of women found in earlier life course studies. Finally, we are interested in the consequences of the changing (institutional) contexts before and after unification in East Germany and compare these developments with trends in West Germany.

Finally, the literature focussing on the effect of women's education on divorce is voluminous. Yet, most of the empirical studies have concentrated their analysis only on the correlation between women's educational attainment level and divorce risk (after controlling for important other influences). In addition, there are few studies that have estimated the effects of the educational level of both spouses on the divorce rate. However, these studies have provided contradictive empirical evidence. Bumpass and Sweet (1972) were the first among the very few who studied the marital stability of homogamous and heterogamous marriages, taking into account not only the educational levels of spouses but also the similarities and differences within couples. The problem with this research is that the interpretation of the effect of educational gaps within heterogamous couples is complicated by different social meanings of education. Education is not only an indicator of the individual's human capital and market opportunities but also reflects individuals' cultural, symbolic and social resources as well as varying socialization experiences. In particular, the economic theory of the family predicts that, for couples where women are

marrying a partner with a lower educational attainment, 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. We therefore attempt to find answers to some of the discrepancies in the earlier divorce studies. In particular, we develop a new theoretical approach and disaggregate the marriages of women into upward, downward and homogamous marriages in order to estimate the specific meanings of spouses' education on divorce in these different educational matches.

1.2 Outline of the Thesis

This thesis consists of seven independent but interrelated empirical articles which are included in this thesis as Chapters Two to Eight. The first introductory chapter puts the seven research papers into a long-term historical context, describes the principles of our life course approach, the utilized longitudinal data set and the applied methods of event history analysis. The concluding Ninth Chapter summarizes the main findings of the seven empirical papers and their theoretical and political implications. It also discusses the limitations of the thesis and makes suggestions for future research. Each of the seven empirical chapters examines a particular demographic question and studies the family or fertility events as a product of historical periods, cohort specific experiences and events in other life course domains. With regard to the life course domains, we focus on the effects of women's social origin, educational participation, changing educational attainment levels, labour force participation and employment contracts as well as the education of the partner. A topic-specific literature review, selected theories and an overview of the state of the empirical research are presented in each of the empirical chapters and are followed

by a discussion of specific research questions and the formulation of testable hypotheses. We particularly focus on the impact of historical periods before and after the German unification in East and West Germany. In all of the empirical chapters, we are using data from the adult cohort (starting cohort 6) of the 'German National Educational Panel Study' (NEPS) and apply advanced discrete-time event history methods. Since, the data preparation was done differently for each of the chapters depending on the demographic outcome in question, we describe the dependent variables and the covariates separately in each chapter.

This thesis consists of nine chapters in total. The seven empirical chapters are embeded in the life course approach and therefore ordered according to the timeline of family events in a woman's life course. Nevertheless, these transitions do not have to happen in this specific order for all respondents in the life course.

Chapter One introduces into the life course perspective with its five principles (the principles of lifespan development, linked lives, agency, timing of events and transitions as well as historical time and space) that are important for this thesis (see Elder, Johnson & Giele, 2003). Furthermore, it gives an overview of the long-term developments and recent trends in family formation and dissolution processes in Germany. Since Germany has experienced an historical period of about forty-five years of division between 1945 and 1990, it is necessary for the interpretation of our results to introduce the reader into the long-term commonality of German history before the division, the differences during the German separation into the capitalist and socialist regimes and their possible consequences after German unification.

Chapter Two represents a descriptive article and focuses on the sequences of partnership states, the proportion of ever married and childless women as well as women's partnership status at first birth for different birth cohorts in East and West Germany.

Chapter Three, the second empirical article, analyses single women's entry into first cohabitation or first marriage in East and West Germany as competing risks. We observe women from age 16 onwards until they enter into their first union being it cohabitation or marriage. We censor the data on the right, if women were interviewed before they have entered into their first cohabitation or first marriage.

Chapter Four, the third empirical article, studies possible differences in the structure of cohabitation in East and West Germany before and after German unification. Therefore, women's transition from first cohabitation to first marriage and the dissolution of a first cohabitation are analysed as competing events. We follow up women from the beginning of their first cohabitations until they enter into marriage or separate. Cohabiting women are right censored when they have not had a transition into marriage or the dissolution of their first cohabiting union until the time of the retrospective interview.

Chapter Five, the fourth empirical article, explores single women's transition into first union with different educational partner matches as competing events in Germany. We follow up single women from age 16 until they make the transition to first (downward, homophilous or upward) cohabitation or first (downward, homogamous or upward) marriage. Single women are right censored when they have not had a first (marital or nonmarital) union until the time of the retrospective interview.

Chapter Six, the fifth empirical article, focuses on the transition into first motherhood of women enrolled in full-time education in East and West Germany. We observe women from age 16 onwards on a monthly basis as long as they are enrolled in full-time education and until they conceive their first child during full-time educational enrolment. We censor the data on the right if women have left full-time education without conceiving a child or if they were interviewed before they have finished education. Therefore, fertility histories of women are combined with their educational trajectories.

Chapter Seven, the sixth empirical article, studies the impact of educational enrolment, educational attainment level, labour force participation and career advancement on women's entry into first motherhood in East and West Germany. We follow up women from age 16 onwards on a monthly basis until the conception of a first child. Right-censoring takes place in the analysis if women have not entered into motherhood until the age of 45 or until the time of the last interview.

Chapter Eight, the seventh empirical article, explores the effect of educational assortative mating among spouses on the risk of divorce. The women under study are at risk of experiencing a divorce as soon as they enter into their first marriage and we follow them up until the event of a divorce. Women who are married for the first time and do not experience a divorce until the time of the last interview are right-censored.

The findings of each of the seven empirical chapters and how they are related to each other are summarized in the Ninth Chapter. In particular, we discuss the effect of education and work on family events in women's life courses in East and West Germany. This chapter concludes with the implications of our research for policymakers as well as a discussion of the limitations of our study and the challenges for future research initiatives.

1.3 The Life Course Perspective

The predominant theoretical approach in this thesis is the life course orientation. It links changes in one domain of life to changes in other life domains (Elder, 1974; Hogan, 1981). Hence, it regards the life course as the result of events in parallel and interdependent processes resulting in an individual's life course. Elder, Johnson and Giele (2003) have summarized the following five conceptual dimensions of life course research: (1) the principle of lifespan development; (2) the principle of linked lives; (3) the principle of agency; (4) the principle of timing of events and transitions; and (5) the principle of time and space.

The first principle, the *principle of lifespan development*, emphasises a long-term perspective on the individual throughout the course of life. It focuses on the causal structure within and between the life domains in the respective past on present and future life course transitions of the individual (Giddens, 1991; Mayer & Tuma, 1990; Nowotony, 1994). It uses notions of stages, progressions, growth and evolution in conceptualizing the life course development (Baltes, Lindenberger & Staudinger, 2006; Dannefer, 1984). Life course research focuses on long-term trajectories, pathways and career lines and how they shape individual lives (Mayer & Tuma, 1990). For example, the family life cycle theory (Elchardus, 1984; McGoldrick & Carter, 2003) suggests that there are six ordered stages through which a family moves over time. These stages define the life course transitions for individuals. It is assumed that individuals leave parental home and become single adults, start a couple by marrying (see Chapters 2, 3, 4 & 5), become parents by getting children (see Chapters 6 & 7), become parents of adolescents and young adults, enter into an empty nest phase when their children have exited the family and, finally, become single elderly adults when their partners pass away. Of course, this is a stylized picture of the family career over the life course. The reality in modern societies is much more complex. Neither do all people have the family stages and events in this defined order (for example some individuals are having children before they marry), nor do they move through all the described family stages (because some are experiencing separation or divorce) (see Chapter 8). In addition, there are also new family stages such as consensual unions (see Chapters 2, 3, 4 & 5)or being a single parent that have gained in quantitative importance in recent decades. Modern sociological life course approaches therefore emphasize the variability of family states and their transitions over the life course and the influences of other life course domains on the family trajectory. An important idea of modern life course research is therefore that the development in one domain of life is not an isolated process but embedded into a multitude of processes in other life course domains that are interde-

pendent over the life course. For example, educational events, such as completing school or returning to school, have an effect on the events in a family career – and vice versa. In other words, the movement of individuals through family states is a central concern of modern life course studies, both as an outcome to be explained and as a causal condition of changes in other life course trajectories.

The concept of trajectories encompasses both sequences of different qualitative states and continuous increases or decreases of quantitative characteristics such as investments into human capital or social relationships. Dannefer (1987) introduced the so-called Matthew effect ("For to everyone who has, more shall be given, and he will have an abundance; but from the one who does not have, even what he does have shall be taken away." Mt 25, 29) into the life course literature which links early small inequalities in family life with more enhanced inequalities in later life. For example, if unskilled women, coming from lower social backgrounds, marry very early and have their first child at a very young age, they have a higher likelihood of experiencing a divorce and becoming a single mother with a high risk of poverty. The Matthew effect is sometimes also referred to as the cumulative advantage/disadvantage hypothesis (O'Rand & Henretta, 1999). This means that advantages of some social groups and/or disadvantages of other social groups tend to increase over the life course so that the inequality between different groups is monotonically rising over time. In methodological terms, the principle of life span development requires that life histories in different life domains are collected with exact timing information of events over longer life spans. Today, this is done with retrospective event history studies and prospective panel studies such as the German Life History Study (GLHS), the Socio-Economic Panel (SOEP) and the National Educational Panel Study (NEPS) in Germany. Event history models allow then to model the effect of time-dependent covariates of associated life domains as well as state and duration dependencies of the process of interest on the rate of future life events.

The *principle of linked lives* stresses the interdependence of lives of different individuals over the life span. It refers to both to individuals within and outside the family (e.g. friends and colleagues) (Moen, 1995). For this thesis, the relationships within the family are especially important. The marriage links individuals as husbands and wives and engenders a long-term dynamics of interdependence (e.g. the respective influences of job careers among spouses) (see Chapters 3, 4 & 5). However, during the last decades, a remarkable shift has taken place in the process of family formation so that the distinction between partners in marital and cohabiting unions has become blurred. In addition, modern societies have shifted from the traditional 'male breadwinner and female homemaker' model towards the 'dual-earner' family model which also changes the relationship between the partners. Families also link different generations by bonds of kinship and processes of intergenerational transmission (Moen & Hernandez, 2009). For example, individuals' social origin influences the duration of educational participation over the life course and therefore has an indirect impact on the age at entry into first marriage and first parenthood. In methodological terms, the principle of linked lives requires that not only the life histories of single individuals are collected but also the histories of associated people (e.g. family, partners, spouses, children, peers, or friends). Again, time-dependent covariates in event history models allow us to study the effect of changes in these associated life courses on the individual of interest.

The third life course principle, the *principle of agency*, means that people at each point of their lives are not completely pushed from behind by a specific pre-trajectory in one life domain or by previous events in other life domains or by earlier actions of linked individuals but they also have the capacity to make their own free choices (Mayer, 1990). In other words, individuals are not passive executors of structure and completely determined by events in the past but are also capable of purposive action and able to weigh the available life course alternatives based on their possible future costs and benefits (Gambetta,

1987). Life course studies therefore take into account both individuals as active agents who construct their lives and make choices and external life course constraints which narrow down people's feasible sets of future life course alternatives as well as their costs and benefits. Thus, life course research needs an action model that allows us to think about how individuals in specific life course situations link external constraints that result from previous life course experiences and the dominant institutional and historical settings, with their own individual purposes in order to make choices (Mayer, 1990). Today, quantitative life course research draws on a variety of rational action theories in order to model individuals' life course actions (Goldthorpe, 2007). In methodological terms, the principle of agency also means that life course research cannot work with deterministic models but has to work with probabilistic statistical approaches. Event history analysis is a particularly appropriate tool for life course researchers because it is able to link events and action conditions of the past with the probability that individuals make a specific life course transition at each point of the life course.

The principle of timing of events and transitions is the fourth rule of the life course perspective. It stresses that the consequences and the impact of life course transitions and events are highly dependent on when they occur in an individual's life. Life course studies have shown that normative timing exists with regard to various life course transitions (Settersten & Mayer, 1997). For example, in society there exist collective expectations with regard to the age when women should have their first child (Elder, 1975, Settersten & Mayer, 1997; Neugarten, Moore & Lowe, 1965) (see Chapters 6 & 7). Individuals are aware of both, the social clock and their own clock compared to others. So, they can describe themselves as early, late or on time with regard to entry into motherhood. This earliness or lateness of a life course transition, such as marriage (see Chapters 2, 3, 4 & 5) and motherhood (see Chapters 6 & 7), might then have consequences for later life course choices such as union separation or divorce (see Chapter 8). Thus, the timing of events is

often connected with single or multiple risks. In methodological terms, the impact of early, late or on-time events can easily be described by survivor functions and embedded in the dynamic statistical framework of event history models.

Finally, the *principle of time and place* states that the life courses of individuals are embedded and shaped by historical periods (e.g. before and after German unification, and post-unification recovery and opportunity) and specific locations (e.g. growing up and looking for work in East and West Germany) (Elder, 1974; Hareven, 1994; Hogan, 1981) (see Chapters 2, 3, 4, 5, 6, 7, & 8). Previous research has shown that it is important to nest individual lives within institutional and historical contexts (Diewald, Geodecke & Mayer, 2006). In the social sciences we distinguish three timing effects (Mayer & Huinink, 1990): age, period, and cohort. The age effect is located at the micro level of the individuals. It means that as individuals get older they tend to change due to biological, psychological or social mechanisms. For example, women can only get babies in a certain biological age range, modern societies legally require a certain minimum age to enter into marriage, and with increasing age, young men and women get psychologically and economically ready to make long-term commitments such as marriage or parenthood. The period and the cohort effects are located at the macro level. They reflect structures of opportunity and both constrain and enable life course transitions and trajectories (Shanahan, Elder & Miech, 1997).

The period effect means that all individuals are influenced by the same contemporary historical conditions in a similar way – independent of their specific age or birth cohort. For example, a severe economic crisis, connected with unemployment and despair, may suppress all individuals' readiness to marry, have a baby or to get a divorce. The cohort effect refers to a persistent change over the life course for all members of a specific cohort that experience the historical condition during a certain vulnerable life stage or sensi-

tive life course transition (Ryder, 1965). For example, an economic crisis experienced by young people who are in the phase of family formation may lead to a long-term lower fertility of this birth cohort. In our empirical analyses, we model the age effect by including explicitly age as well as other age related covariates reflecting the changing readiness to make certain demographic life course transitions. The period effect is introduced into our models by including historical periods before and after German unification and time-dependent covariates describing the changing unemployment rate. Finally, the cohort effect is modelled by birth cohort dummy variables.

1.4 The Long-Term Developments of Women's Roles in Germany and Changes in Family Formation and Dissolution

Over the last centuries, a persistent gender-specific division of work can be observed in the family and the labour market in Germany (Nave-Herz, 2004: 40). Men have always fulfilled productive functions at home and in the labour market while women have been predominantly responsible for housework and child rearing. At the same time, women have also - in different forms and to varying degrees – participated in home production (e.g. as helping family members) or in gainful employment (Müller, Handl, & Willms, 1988). Thus, the fact that women have productive roles is by no means a new phenomenon. What has drastically changed is the type of work women do over the centuries. During the last decades, women have been increasingly more participating in gainful employment, especially in unskilled production and skilled administrative and service jobs (Nave-Herz 2004: 40). In order to describe how gender roles and the demographic behaviour have changed in Germany, we will give a brief overview of the long-term developments since the beginning of the 19th century and describe trends with regard to labour force participation, fertility, cohabitation and marriage as well as divorce. We will begin with a brief description of the pre-industrial family in Germany.

1.4.1 The Pre-Industrial Family in Germany in the Early 19th Century

Following Nave-Herz (2004), we can distinguish two main types of families in Germany in the early 19th century: (1) families *with* a production function, and (2) families *without* a production function. The former type were family based economies. Such families were extended families with grandparents, parents, children and perhaps other relatives living together within one household where the rooms were also used for production. Hence, there was no strict separation between work and family life and all family members worked together in order to sustain the economic basis of the family. Men and women had gender-segregated productive tasks and women could reconcile their productive and family responsibilities. In pre-industrial farming families for example, women were not only responsible for housework and childcare but also for parts of the productive work such as animal husbandry, vegetable production or work on the field. Families without a production function were predominantly families from the lower social classes. These families did not own any property and were compelled, in order to survive, to sell their work on the labour market. Women and mothers from these families usually were domestic servants in other families or worked as cook maids, laundrywomen or sewers on demand (Nave-Herz, 2004: 47). Besides these two main types of families, there was a small proportion of families that belonged to the nobility. Women of these aristocratic families did not have to do any work, since they had domestic workers that were responsible for childcare and housekeeping.

At this time, marriages were not based on the ideal of romantic love but rather arranged according to the social and economic interests of the larger family and kinship groups (Nave-Herz, 2004: 41). A prerequisite for marriage was individual's economic self-reliance. Many people remained single because they were not able to provide a dowry or to economically sustain a family. In this historical period, the birth rate was high within marriage and on average women gave birth to about eight to twelve children.

However, due to high infant mortality, the number of surviving children was much lower and reached a total of three to four children per family. Due to the high rate of infant mortality the relationship between parents and children used to be completely different from today (Nave-Herz 2004: 42). This relationship was far less emotional and children were not granted any stage of development. In fact, they were regarded as adults and integrated into the productive life of the family at a very young age.

1.4.2 The German Family in the Second Half of the 19th Century

In the second half of the 19th century, two new types of families increased their importance in the course of industrialization: (1) the bourgeois and (2) the proletarian families. In both types of families, there was a strong spatial separation between family and productive life. Thus, the problem to reconcile work and family demands emerged. The spatial separation of work and family life reinforced the male breadwinner and female homemaker roles and was particularly consequential for women. It was the first time in history that female housework and male gainful activities were uniformly separated, whereby a group of women was referred solely to housework and raising children (Nave-Herz: 2004: 29).

Although the proletarian families outnumbered by far the bourgeois families, the ideal of the bourgeois family was the dominating model. The bourgeois family is characterized by a nuclear family with parents living together with their children. With regard to the age at first birth, there was a trend towards a slightly increasing age at first parenthood. The declining mortality rate decreased the number of births per woman and the relationship among the family members has become much more intimate and emotional and privacy gained in importance. Furthermore, both parents started to share greater responsibility for their children, but childcare and child rearing were still the main task of women. Childhood was understood as a new life phase and there has been a greater interest of parents in

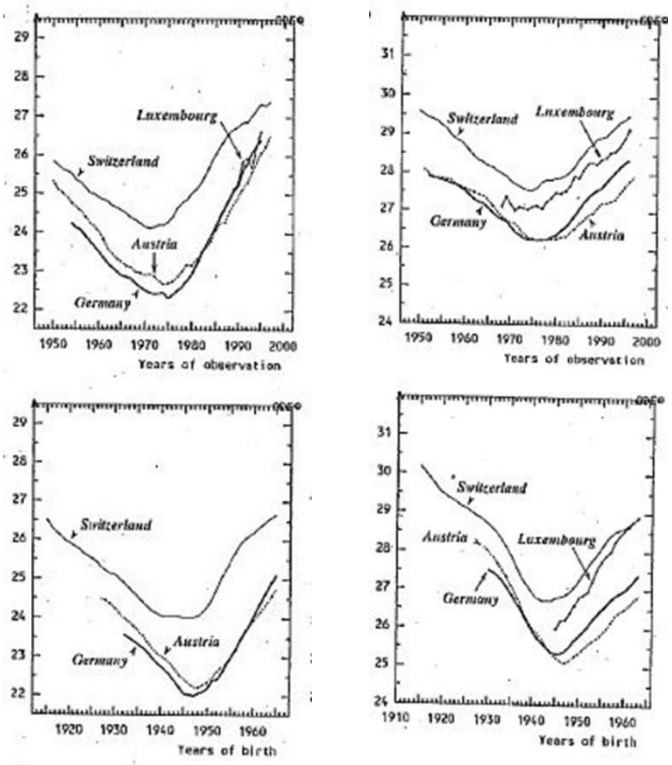
children's development and education. Romantic love became the sole legitimate reason for marriage (Illouz, 1997; Nave-Herz, 2004: 51). Sexuality gained in importance, became more personal and inextricably bound to love. However, the majority of the population was not able to live according the ideal of the bourgeois family until the end of the 19th century.

1.4.3 The Age at First Marriage and the Birth of a First Child in the 20th Century

At the beginning of the 20th century, the ideal of the bourgeois family increasingly spread in the social reality in Germany and reached its peak in the 1960s. The German state purposefully supported the housewife marriage through targeted family, employment, and tax regulations (Mühling & Schwarze, 2011). The Civil Code (Bürgerliches Gesetz Buch, BGB), which was introduced in 1900, clearly regulated the division of labour within the family by assigning the housework and childcare as tasks of the wife and the role of the provider of the family as well as its outward representation to the husband. Women who were working in gainful employment outside of the household needed the permission of their husband and were experiencing difficulties to reconcile family and work demands.

Until the late 1960s, it was common that young women and men had to acquire a basic stock of goods for the future joint household as a prerequisite to marriage. Due to this need to safe for a dowry, both the age at first marriage (Figure 1.1, left column) and the age at first birth (Figure 1.1, right column) were relatively high in the early 1950s. In the course of the economic miracle and the improvement of the living standard in the capitalist West Germany in the 1960s and early 1970s (e.g. Watkins, 1986; 1990; Heeren, 1973), young people were increasingly able to acquire the economic basis to start a family at younger ages. In the socialist East Germany, young couples were only entitled to get a new flat if they were married in the 1960s and 1970s (Wagner & Huinink, 1995). Thus,

Figure 1.1: Average age at first marriage and first child birth by calendar year and birth cohort in selected countries

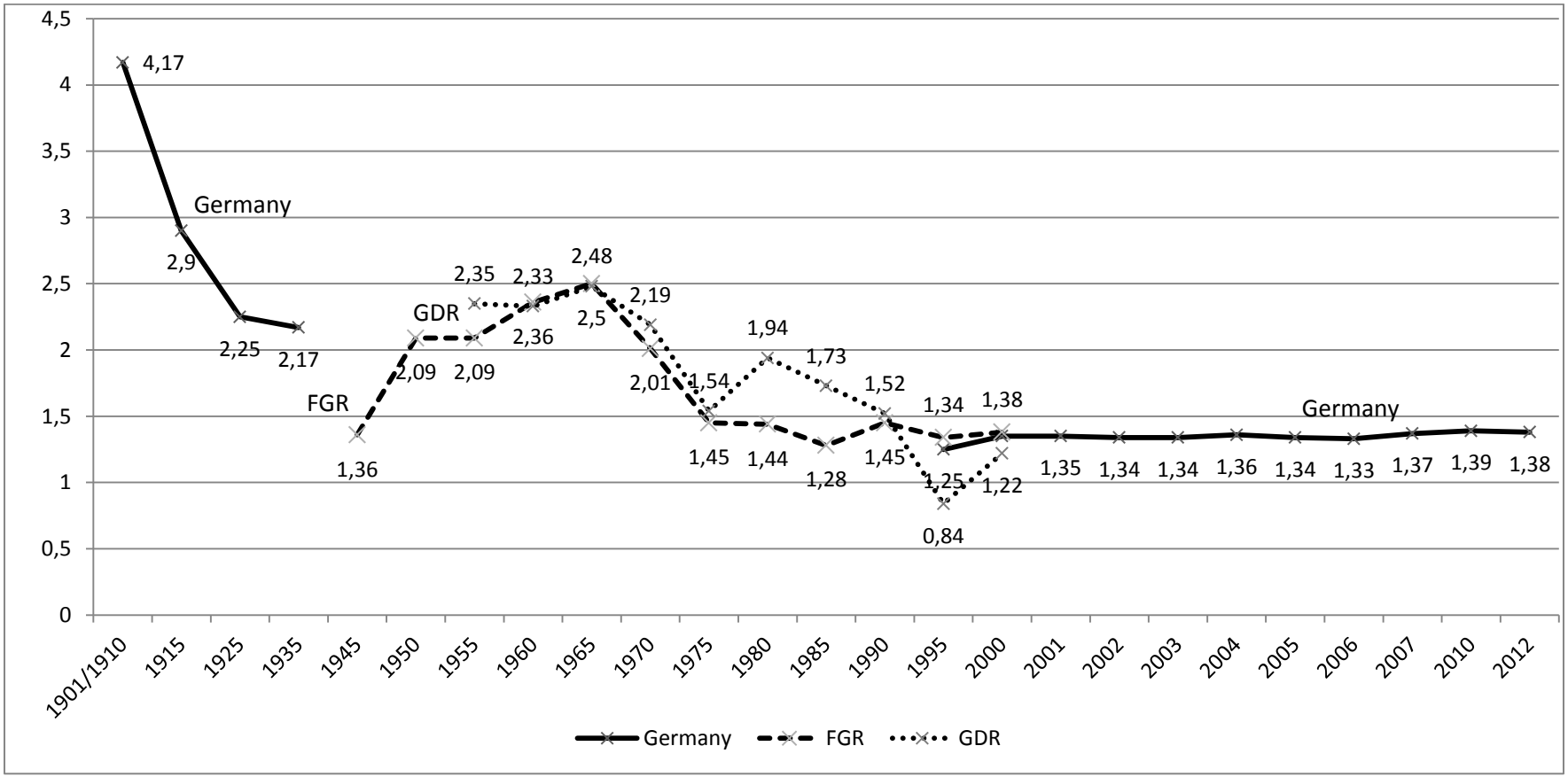


Source: Calot (1998), p. 14

East Germans were relatively young when they started a family. Here, it is important to notice that until the 1970s, the norm that one should be married if a couple lives together still was effective in East and West Germany. As a result, the age at first marriage (see right column of Figure 1.1) and the age at first birth (see left column of Figure 1.1) decreased until the middle of the 1970s. Figure 1.1 shows that it was about the birth cohort of 1945 that had the lowest age at first marriage and first birth. The birth cohorts before and after the 1945 cohort did have a much higher average age when they started to have a family.

Demographers refer to the developments between the late 19th century until well into the 20th century as the phase of the first demographic transition (Notestein, 1945). The model of the first demographic transition describes the change in mortality and fertility rates as a sequence of four phases. In the first phase, the mortality and birth rates are

Figure 1.2: Total fertility rate for Germany from 1901 to 2012



Source: Schwarz (1991); Statistisches Bundesamt (2013)

high and remain roughly balanced, resulting in a slow population growth. In the second phase, based on increasing industrialization and improved living and health conditions, the mortality rates start to decline which results in a growth in the population. In the third phase, parents react to the increase in life expectancy (especially of children) with a reduction of their fertility. Figure 1.2 describes this process for Germany. It shows that the total fertility rate (TFR) has fallen from 4.17 in 1900 down to 2.17 in the 1930s. The TFR is the average number of children that are born to a woman over her life time. At a low level of infant mortality, demographers assume a TFR of 2.1 to sustain a population level. In the fourth phase, a new balance between the mortality and birth rate is obtained at a lower level. However, Figure 1.2 shows that a stable level of fertility rates was actually never achieved in Germany after the first demographic transition.

Lesthaeghe and Neels (2002) described the changes in marriage and fertility in the course of the first demographic transition and link these demographic trends to societal developments and value changes that support them.

With regard to marriage they link

- an increase in the marriage rate and a decline in the age at first marriage;
- a low or reduced non-marital cohabitation; and
- a low divorce rate and high remarriage rate;

and with regard to fertility they link

- few births outside of marriages;
- a decline in marital fertility due to fewer birth at older ages;
- a lower age at first parenthood;
- inadequate contraception;
- a low final childlessness among married couples.

to the following value and structural changes

- a focus on the satisfaction of basic material needs: income, working conditions, housing, health, education and social security;
- rising participation rates in political, civic and community oriented networks (strengthening of social cohesion);
- a strong normative regulation by the state and the churches;

- segregated gender roles, family-oriented policies and embourgeoisement; and
- highly standardized life course transitions and one single family model.

1.4.4 The Development of Female Employment Between 1882 and 1980

Willms (1983: 34-36) has summarized the most important indicators for the long-term development of female employment in Germany (see Table 1-1). The first indicator of Table 1-1 is the time series of female labour force participation published by the Statistical Office in Germany. It shows the percentage of economically active women in the German population. The change in the rate suggests that there was a strong increase in female employment. However, women who worked as helping family members in the family business are massively underrepresented in this data. Furthermore, women who are beyond working age are also included into these figures.

If we limit our description to the people who are of working age (indicator 2 in Table 1-1), as Willms (1983) does, and if we take into account that wives who worked for the family business in 1907 were massively underrepresented in the official statistics, then a different picture emerges. It turns out that, over a long historical period, about half of the women have always been employed with a slightly increasing trend. The year 1950 is the exception, since only about 44 per cent of women were employed. This setback is due to the high unemployment rate in the immediate post-war period. The third indicator in Table 1-1, which represents the labour force participation of men of working age, shows that more than 90 per cent of men were always employed. There has only been a small change in the level of male employment over time.

Willms (1983) points out that, in the long run, it is not so much the female labour force participation that has been changing, but rather the nature of activities that women do. Table 1-1 shows that women's work within the family has become less important (indicator 6). In contrast, the proportion of wives who participated in market-based forms of

Table 1-1: Indicators on female employment, 1882-1980

Indicator		Year 1882	1895	1907	1925	1933	1939 [c]	1950 [d]	1961	1970	1980 [e]
Labour force participation											
1.	Female labour force participation rate according to the „long series“	24.0	25.0	30.4	35.6	34.2	36.1	31.3	33.4	30.0	
2.	Female labour force participation rate with working age [a]	(37.5)[b]	(37.4) [b]	(45.9) [b]	48.9	48.0	49.8	44.4	48.9	49.6	52.9
3	Male labour force participation rate with working age [a]	95.5	95.0	95.2	95.3	93.9	95.6	93.5	93.5	91.1	86.4
4.	Female labour force participation rate with working age who are single[a]	69.4	67.5	71.7	73.8	73.7	77.2	68.7	69.2	68.1	62.0
5.	Female labour force participation rate with working age who are married[a]	(9.5) [b]	(12.2) [b]	(26.3) [b]	29.1	30.1	33.8	26.4	36.5	40.9	48.3
6.	Proportion of married women who assist in the family	32.2 (3.1) [b]	23.4 (4.7) b	19.7 (17.4) [b]	19.7	19.8	20.6	15.4	12.7	7.8	4.7
7.	Proportion of married women who are employed	6.1	7.3	8.6	9.0	9.4	11.9	9.6	20.1	27.4	35.9
8.	Proportion of married women who are employed among all married women	38.3	30.7	28.3	28.7	29.2	32.5	25.0	32.8	35.2	40.6
Occupational and industrial structure											
9.	Proportion of married women who are employed on the labour market	10.2	11.9	14.8	15.6	18.3	23.6	19.7	35.7	50.7	57.0
10.	Proportion of women who work in the family business	76.0 (47.7) [b]	75.5 (56.0) [b]	75.6 (74.1) [b]	76.0	78.1	82.2	79.8	82.3	81.5	86.4
11.	Proportion of women who work in the labour market	21.0	27.0	26.5	27.6	27.2	27.1	28.6	32.5	32.7	36.2
12.	Proportion of women who work in agriculture	61.4 (45.7) [b]	53-5 (41.9) [b]	49.8 (48.4) [b]	43.3	40.5	38.5	35.2	19.7	10.6	6.7
13.	Proportion of women who do housework	18.0 (25.2) [b]	18.2 (22.8) [b]	16.1 (16.5) [b]	11.4	10.5	10.5	9.0	3.4	1.4	
14.	Proportion of women who work in the industry or craft sector	12.8 (18.1) [b]	16.8 (21.0) [b]	19.5 (20.0) [b]	24.8	23.6	25.0	24.8	32.6	35.3	31.1
15.	Proportion of women who works in the tertiary sector	7.7 (11.0) [b]	11.5 (14.3) [b]	14.6 (15.1) [b]	20.5	25.4	26.1	31.0	44.3	52.8	
16	Proportion of men who are employed in the industry or crafts sector	38.1	42.7	47.5	50.0	48.8	48.3	51.9	57.6	57.2	55.4
17.	Total of female gainfully employed persons in thousands[f]	7.794	8.219	9.742	11.478	11.479	12.802	7.949	9.912	9.9482	10.478

[a] 1882, 1950-1980: aged between 15 and 60; 1895-1939: aged between 16 and 60; [b] women that work in the family business are underrepresented in the occupational census of 1882, 1894 and 1907, thus, we have stated the proportions in parentheses; [c] territory of the German Reich 1937; [d] territory of the Federal republic of Germany without Berlin and Saarland; [e] result of the micro-census; [f] including respondents that have not specified their occupational status or sector; 1939 including those in the Labour Service

Source: Müller, Willms-Herget, Willms & Handl (1983).

work have risen sharply (indicator 7 in Table 1-1). This means that there is in particular a rise in gainful employment of married women. Hence, married women were increasingly forced to reconcile work and family, as these employed women continued to be responsible for the housework and child care. Due to the continuing increase in female labour force participation, we can observe a declining gap between the labour force participation rates of both sexes in Germany (indicators 2 and 3 in Table 1-1; Willms 1983: 36).

Single women (indicator 4 in Table 1-1) never worked in the family business to the same extent as married women, therefore the decline of these work activities remained largely without consequences for them. Single women have always mostly been working in gainful employment forms. However, since the 1960s, the proportion of working single women in West Germany is declining due to both increasing educational participation and the introduction of early retirement (indicator 4 in Table 1-1).

Until the beginning of the 20th century, the proportion of single and married women who were employed was distributed very unequal. Only a small proportion of married women were employed at the beginning of the 20th century (see indicator 9 in Table 1-1). While single women were mostly working in gainful employment (see indicator 4 in Table 1-1), married women limited their work to the domestic and family sphere. In the Federal Republic of Germany (FRG), the proportion of married women working outside the family strongly increased so that in the early 1980s, the majority of women who were employed were married women (see indicator 9 in Table 1-1). In East Germany, during the German Democratic Republic, both single and married women have always had a very high rate of (full-time) labour force participation.

If we focus on economic sectors in Germany, we can see a dramatic shift in the proportion of working women from one sector to the next over time (see indicators 12-15 in Table 1-1). In 1982, about 80 per cent of women were working in the domestic economy

or in agricultural enterprises (see indicators 12 and 13). Later, the proportion of women who work in these sectors has declined massively. In the 1980s, only about seven per cent of women were still working in agricultural enterprises or domestic economies. In the course of the industrialization, the proportion of women in the industrial and production sectors increased until the late 1970s. In the 1980s, however, female employment in the industrial and production sectors started to decline and women increasingly worked in the tertiary sector (indicator 14). Since the 1970s, the majority of women in East and West Germany have been employed in the service sector.

1.4.5 The Gain in Importance of Part-Time Employment Since the 1960s

In the 1960s, the labour force participation rates of (married) women began to increase (see indicator 1 and indicator 5 of Table 1-1). In West Germany, this rise is strongly associated with the growth of female part-time work. Table 1-2 illustrates this general development. It displays the proportion of women in West Germany, employed in part-time work over time. It is clearly visible that the proportion of part-time working women was still in the single digits in the 1950s. Within four decades, this proportion increased up to 35 per cent. Blossfeld and Rohwer (1997) link this development to the specific historical situation in Germany in the 1960s. At that time, the bourgeois family model with its traditional gender roles was predominant in West Germany. This classical family model was supported by the conservative welfare state with its specific taxation of married couples ("tax splitting"). In this structural context, part-time work offered an attractive compromise for married women to reconcile work and family demands. In addition, women's growing educational investments increased their labour supply across birth cohorts (Blossfeld & Hakim, 1997). After the birth of a child, qualified women thus often use part-time work as a bridge to full-time employment, until their child caring demands

Table 1-2: Trends in part-time employment by Gender for West Germany, 1950-2010 (in per cent)

	Part-time employment in %		
	Male	**Female**	**Total**
1950	1	6	3[a]
1960	2	9	4
1961	2	10	4
1962	2	12	5
1963	2	13	5
1964	2	15	6
1965	2	16	7
1966	1	18	7
1967	1	19	7
1968	1	19	8
1969	1	22	8
1970	2	24	9
1971	2	26	10
1972	2	28	11
1973	2	29	11
1974	2	28	11
1975	2	29	12
1976	2	29	12
1977	2	31	12
1978	2	30	12
1979	2	30	12
1980	1	29	12
1981	1	30	12
1982	1	30	12
1983	2	33	14
1984	2	31	13
1985	2	31	13
1986	2	31	13
1987	2	31	13
1988	2	32	14
1990	2	33	14[b]
1997[c]	4	39	19
2007[d]	5	33	18
2010[d]	6	35	20

[a] Based on the self-assessment of employees according to Hans Kohler (IAB, Nuremberg); [b] Based on the self-assessment of employees according to Hans Kohler (IAB, Nuremberg); [c] Data by the Federal Office of Statistics, micro-census „Gainful Employment 1998“; [d] Part-time employed employees by gender; Data for the whole of Germany, Federal Ministry of Labour and Social Affairs.

Source: Blossfeld & Rohwer (1997), p. 167

decrease (Blossfeld & Hakim, 1997). Thus, the expansion of female part-time work in West Germany was first and foremost a result of the economic miracle in Germany.

In contrast, the proportion of men who worked part-time in West Germany remained fairly unchanged at a very low level in this historical period (see Table 1-2). As bread-winners, men tended to work in full-time employment in the middle of their employment careers and considered part-time work mainly at the beginning of their career or in the transition phase to retirement.

The former socialist countries, including the German Democratic Republic (GDR), experienced no expansion of part-time employment in this particular historical phase (Blossfeld & Hakim, 1997). In these societies, full-time employment of women was considered

important to promote gender equality and it was necessary due to the low productivity in the socialist economy (Diewald et al., 2006). Even today, after the German unification, the rate of women's part-time employment in East Germany is still lower than in its West German counterpart.

1.4.6 Marriage, Birth and Divorce Patterns of Women in East and West Germany

Although the former German Democratic Republic (GDR) and the Federal Republic of Germany (FRG) share the same history before the end of World War II (WWII) and after the German unification in 1990 (Dahlerup, 1994; Diewald et al. 2006), during the 40 years of division both parts of Germany differed markedly in their political systems and policies. In this section, we first describe the differences in East and West Germany with regard to marriage, cohabitation, fertility and divorce that have emerged as a result of the German division from 1949 until 1989. Finally, we show the developments in East and West Germany after the German unification in 1990.

1.4.6.1 The Political Division in Germany Between 1949 and the Unification in 1990

After the end of World War II, the Federal Republic of Germany (FRG) was established in the American, British and French occupation zones by the Western Allies. Subsequently, in October 1949, the German Democratic Republic (GDR) was founded as a socialist state in the Soviet occupation zone. Based on this political separation, different social and economic structures developed in the socialist East and capitalist West of Germany.

1.4.6.1.1 GDR: Young Ages at First Marriage and First Birth and High Divorce Rates

In the GDR, marriage and the family were of major priority, both at the level of the individuals and the level of the socialist state (Huinink, Mayer, Diewald, Solga, Sørensen &

Trappe, 1995; Huinink & Wagner, 1995). According to Huinink and Wagner (1995), this is mainly due to the following five factors: (1) in the German history, marriage and the family were normatively and institutionally established in the population far before the GDR was founded; (2) the political ideology of the GDR proclaimed marriage and the family as the nucleus of the socialist society (Huinink & Wagner, 1995: 147); (3) social policy measures set a great number of incentives to enter into marriage and to set up a family (e.g. access to housing was strongly tied to marriage and having children); (4) the development of a socio-cultural climate where marriage and family-friendly values and norms were promoted (Huinink & Wagner 1995: 147); and (5) the lack of individual life-styles in a socialist society with relatively stable and predictable life courses. In particular, the relatively high social security, the predictability of the life course and the fact that only married couples were eligible for an own apartment were strong incentives for individuals to marry early and set up a family at a young age in the GDR. Furthermore, the wage structure and tax system of the GDR encouraged the dual-earner marriage (Falk & Schaeper 2001: 187). The strong socio-political promotion of the family policy in the GDR was the result of the heavy pressure to succeed with their ideal of marriage and the family (Huinink & Wagner, 1995: 148). Until the construction of the German Wall in 1961, the Soviet occupation zone was facing a massive loss in population size as a result of World War II and the escape of many citizens towards West Germany. This loss in population made it economically necessary to include women as full-time workers into the socialist economy (Obertreis, 1986; Trappe, 1995; Trappe & Rosenfeld, 2000). At the same time, the GDR tried to ensure that the ideals of gender equality and a classless society were implemented. Put another way, the GDR had to ensure that men and women were able to participate in the labour market in a similar way. It was also important that every citizen was able to enter into marriage and raise children. Thus, the GDR promoted the reconciliation of work and family for full-time employed women through the expan-

sion of their childcare facilities. Nevertheless, women's "traditional responsibilities" (Falk & Schaeper, 2001: 186) for the household and children remained unchanged while they were completely integrated into the labour market by full-time employment. Thus, the family and employment policies in the GDR did not achieve the proclaimed goal of gender equality but rather led to a double burden for women.

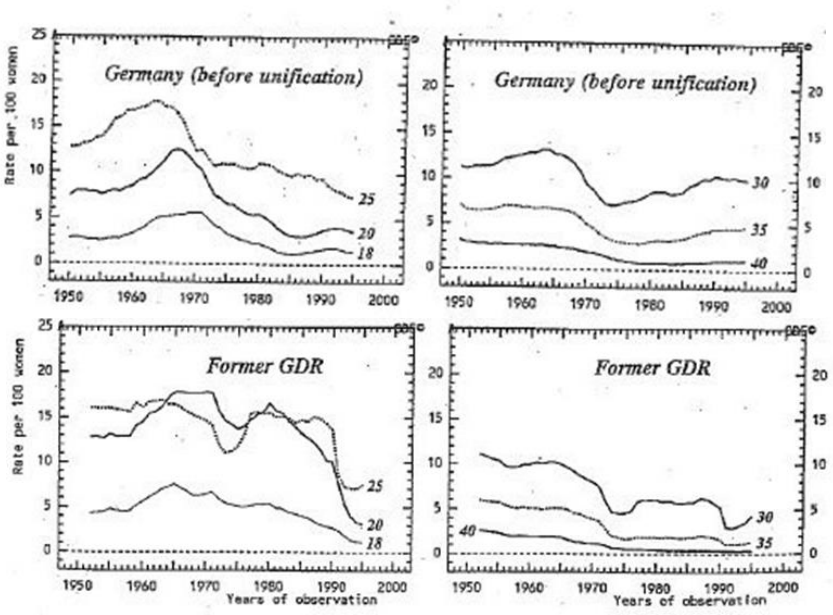
Figure 1.2 (see p. 25) shows the total fertility rate in Germany between 1901 and 2010. It can be seen that in both the GDR and the FRG the total fertility rate is rising in the immediate post-war period. This can be explained by the slowly increasing living standards in both parts of Germany after World War II. In the 1960s and early 1970s, however, the FRG and the GDR were facing a significant decline in the fertility rate (Heilig, Büttner & Lutz, 1990; Höhn & Dorbritz, 1995). In contrast to the FRG, this decline in the total fertility rate had a severe impact on the population size of the GDR, since there was nearly no immigration. Furthermore, the GDR legalized abortion and free access to oral contraceptives in 1972 (Obertreis, 1986). To counteract this fertility decline in the GDR, several family policy measures were introduced in the 1970s (Cornelius, 1990; Dorbitz & Fleischhacker, 1995; Frerich & Frey, 1993; Gysi & Speigner, 1983; Huinink, 1997). Among these policies, there were measures that supported an early family formation, the compatibility between work and family life and single mothers as well as mothers who were enrolled in education. The result of these measures was that mothers were (to a certain extent) economically less dependent on a partner. Furthermore, women were granted paid parental leave ('Babyjahr') and had increasingly more access to free public childcare. Until the mid-1980s, the fertility rates responded to these measures in the GDR and especially the proportion of non-marital births increased dramatically (Büttner & Lutz, 1990; Dinkel, 1984). Nevertheless, Wendt (1997: 126) argues that "despite the clear pronatalist direction and substantial expenditures for social policy programs, the target of raising the number of children to three or more per family was not achieved" and the ef-

fect of the pronatalist family measures was only temporary, since the fertility rates declined again after the mid-1980s. By the time of the German Unification, both East and West Germany were on a low fertility level and far from replacement level.

Figure 1.3 shows the age-specific fertility rates for East and West Germany. Compared to West Germany, East German women entered into motherhood at a much younger age and with a greater proportion of women. After the German unification in 1990, the fertility-rates in East Germany fell sharply for all ages (Figure 1.3). For West Germany, it can be seen that since the mid-1970s, the fertility at younger ages has been declining and at higher ages it has been increasing (see Figure 1.3). Put in a different way, West German women have started to postpone their entry into motherhood over their life course (Blossfeld & Huinink, 1991). Table 1-3 reveals that the proportion of non-marital births in absolute numbers was more than halved from about 200,000 in 1989 to less than 90,000 in 1992 right at the beginning of the German unification. This suggests that mainly planned births were avoided or postponed immediately after the German unification due to the massive uncertainties connected with the social and economic transformations from a socialist to a capitalist society.

Figure 1.4 and Figure 1.5 show the cumulative percentages of women who have already lived (prior to any subsequent marriage) in a non-marital union by age and birth cohort. It shows that, in contrast to the FRG, cohabitation has already been widely spread in the GDR. Figure 1.4 and Figure 1.5 also show that the developments are surprisingly similar in East and West Germany across cohorts, especially when compared with southern European and Scandinavian countries (Blossfeld & Nazio 2003). In the early 2000s, more than half of the young women in East and West Germany have already lived in a non-marital union prior to a possible first marriage. Since the 1980s, the marital setting lost its importance as a "care institution" and environment for rearing children in the GDR. As a

Figure 1.3: Age-specific fertility rates for East and West Germany



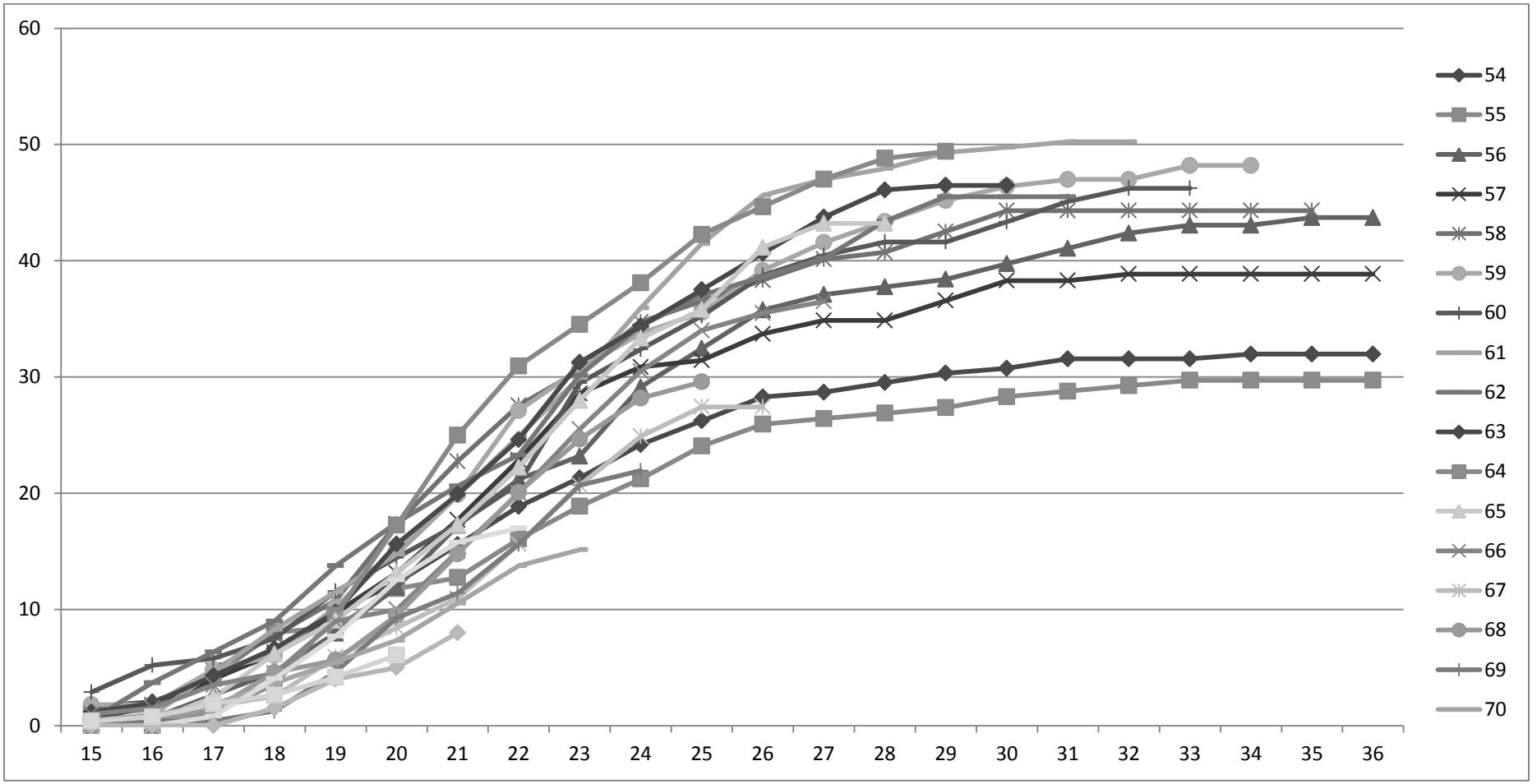
Source: Calot (1998), p. 8 & 9

Table 1-3: Proportion of non-marital births in East and West Germany

Year	Born alive total	Thereof	
		In marriage	Outside of marriage
FRG/Western states of Germany			
1950	812,835	90.3	9.7
1960	968,629	93.7	6.3
1970	810,808	94.5	5.5
1980	620,657	92.4	7.4
1990	727,199	89.5	10.5
1994	690,905	87.6	12.4
1995	681,374	87.1	12.9
2000[a]	655,732	81.4	18.6
2010[a]	542,345	73.0	27.0
GDR/Eastern states of Germany			
1950	303,866	87.2	12.8
1960	292,985	88.4	11.6
1970	236,929	86.7	13.3
1980	245,132	77.2	22.8
1989	198,922	66.4	33.6
1992	88,320	58.2	41.8
1994	78,698	58.6	41.4
1995	83,874	58.2	41.8
2000[a]	111,267	48.5	51.5
2010[a]	102,209	38.8	61.2

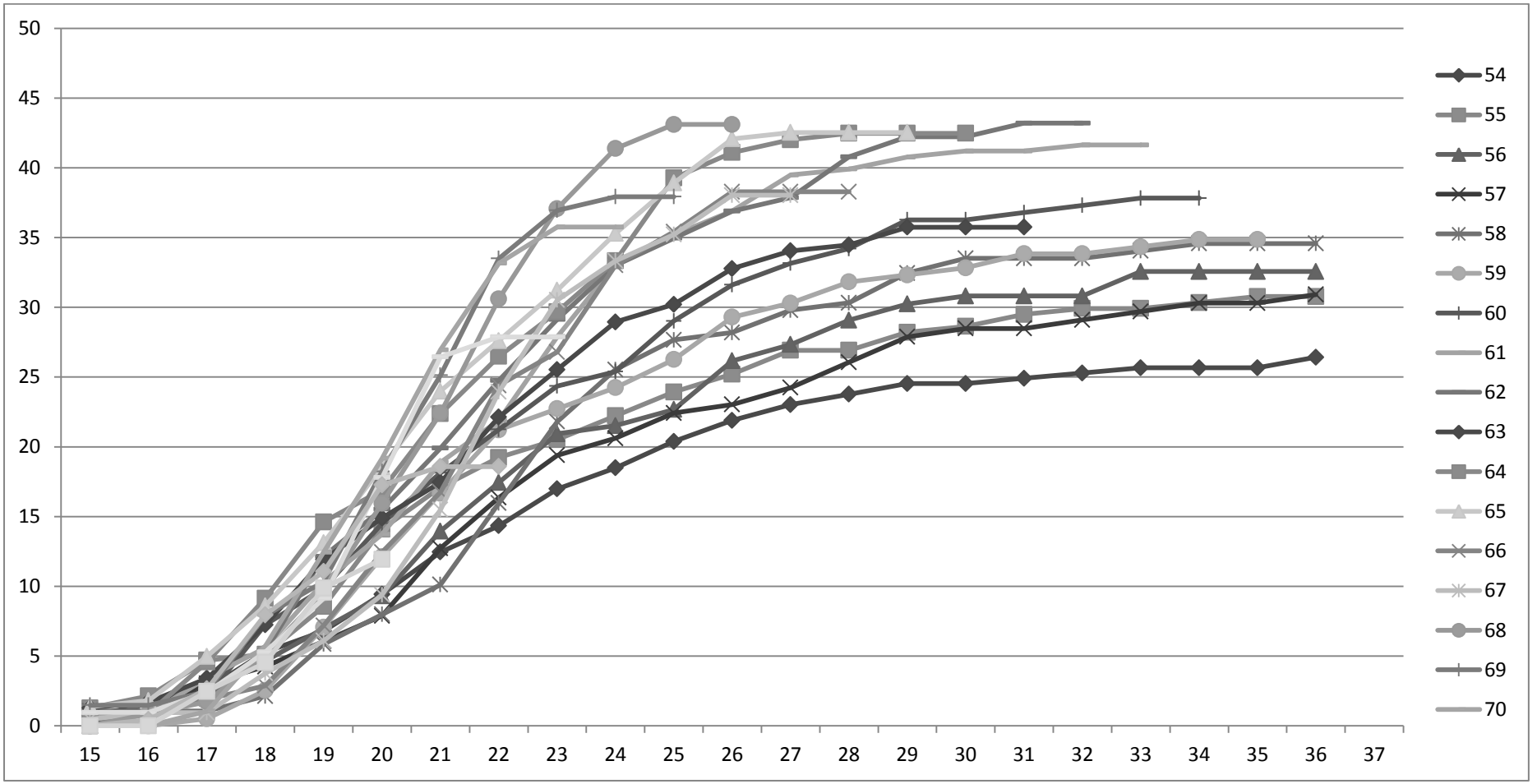
Source: Engstler 1997, p. 85; [a] Pötsch, 2012

Figure 1.4: Cumulative proportion of women who have ever lived (prior to any subsequent following first marriage) in a non-marital cohabitation, West Germany



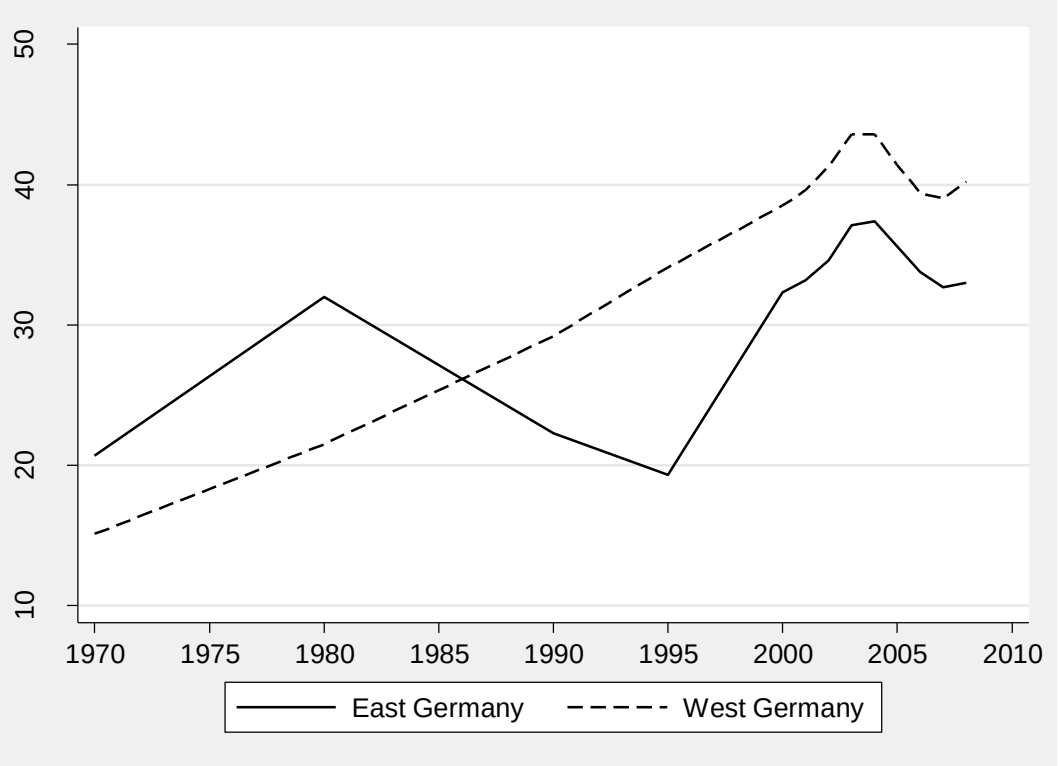
Source: Blossfeld & Nazio (2003), p. 64

Figure 1.5: Cumulative proportion of women who have ever lived (prior to any subsequent following first marriage) in a non-marital cohabitation, East Germany



Source: Blossfeld & Nazio (2003), p. 64

Figure 1.6: Divorce rate in East and West Germany (1970 - 2009)



Source: BMBFSFJ (2005), Statistisches Bundesamt (2012)

result, the number of marriages declined, while the number of divorces increased and co-habitation was used as a substitute for marriage.

Figure 1.6 shows the divorce rates for East and West Germany between 1970 and 2009. In West Germany, the divorce rate monotonically increased from the 1970s to the early 2000s and then slightly decreased. In East Germany, the development of the divorce rate has more ups and downs in the observation window. The divorce rate in the GDR was higher than in the FRG until the mid-1980s. In the middle of the 1980s, West Germany surpassed East Germany in the divorce rate (see Figure 1.6). The early transition period from socialism to capitalism that was connected with a high level of economic uncertainty also seems to have further suppressed the divorce rate in East Germany. After the middle of the 1990s, the divorce rates in East Germany started to rise again and the divorce rates in East and West Germany became more similar.

Table 1-3 shows the proportion of non-marital births in East and West Germany. Since the 1970s, the proportion of children that were born out-of-wedlock was twice as high in East Germany compared to West Germany (Blossfeld & Nazio 2003; Falk & Schaeper, 2001; Huinink & Wagner, 1995). This proportion has even more increased in East Germany after the German unification. As a result, non-marital births are normatively much more accepted in East than in West Germany nowadays.

1.4.6.1.2 FRG: The Diffusion of the "Male Breadwinner and Female Secondary Earner" Model

In the 1950s and 1960s, the male-breadwinner model has been the predominant family form in the FRG (Falk & Schaeper 2001). Many politicians, such as Bruno Heck (the second West German Family Minister), promoted a "three-phase model" of the female life course in the 1950s (see Mühling & Schwarze 2011): (1) a professional life until the birth of a first child; (2) a family phase with female employment interruption; and (3) a phase of return to employment, after the children have left their home. In the course of the female emancipation movement and the beginning of the transformation of the female gender role, more and more mothers and married women became employed in the FRG. Hence, the (part-time) employment of married women with children became increasingly common. As in the GDR, the mothers in the FRG still remained responsible for the household and child care. But in contrast to the GDR, in the FRG the employment of mothers during the first years after the birth of the child was often considered as detrimental to a child's cognitive, social and emotional development (Falk & Schaeper: 191). Whilst the "dual earner marriage" had been promoted in the GDR right from the beginning, there has been a trend from the "male breadwinner" marriage to the "male breadwinner and female secondary earner" marriage in the FRG (Esping-Andersen, 1999; Gauthier, 1996; Gornick, Meyers & Ross, 1998; Holst & Schupp 2001; Treas & Widmer, 2000). Pfau-Effinger (1998) characterizes this development in the FRG also as a change

from the "housewife model of the male breadwinner family" to the "compatibility model of the male breadwinner family".

The West German tax system does not encourage the dual earner marriage. It rather promotes the “male breadwinner” and “male breadwinner and female secondary earner” model. Sainsbury (1997) concludes that the German tax system imposes ‘the most severe penalties on a working wife’. Furthermore, the lack of childcare facilities in West Germany (compared to East Germany) led to a severe conflict between full-time educational participation and family demands for young mothers as well as a severe conflict between labour force participation and family demands for employed mothers. The virtual absence of childcare facilities (such as kindergartens or nursery care institutions) and the economic dependence during full-time educational enrolment caused a postponement of entry into motherhood and marriage for the younger birth cohorts of women in West Germany. In contrast to the GDR, full-time education and parenting as well as motherhood and continuous employment were hard to reconcile in the FRG.

Until today, marriage has still been the dominant care and educational setting for small children and the main context for parenting in West Germany. This is not yet the case for cohabitation since cohabitation is mainly considered as a trial period for marriage in West Germany (Blossfeld & Nazio 2003; Huinink & Wagner 1995: 186). In particular, when West German women become pregnant, the non-marital unions are typically transformed into marriages so that the child can be born and raised within a marital setting (Blossfeld & Mills 2001).

1.4.6.1.3 The Second Demographic Transition in Modern Societies since the 1960s

The changes in fertility patterns and the pluralisation of family forms since the 1960s could not only be observed in Germany but are obviously part of a more general trend in modern societies. Lesthaeghe and Neels (2002) as well as van de Kaa (2002) describe this

change as a Second Demographic Transition. They link the recent developments in marriage, fertility and divorce to the rise of postmodern values in industrialized societies.

With regard to marriage they link

- a decrease in the marriage rates and an increase in the age at first marriage;
- an increase in nonmarital unions (before and after marriage);
- an increase in divorce rates and earlier divorce; and
- a decline in remarriage rates after divorce or widowhood;

and with regard to fertility they link

- a further decline in fertility, mainly due to a delay over the life course;
- an increasing mean age at first birth;
- an efficient contraception;
- an increase of non-marital fertility;
- a growing number of parenthood within non-marital unions; and
- an increasing childlessness in unions;

to the following value and structural changes in modern societies

- an increase in post-materialistic values, e.g. greater importance of individual autonomy, enhanced self-realization and recognition as well as tolerance as important values;
- a loss of commitment in political parties, trade unions and other collective institutions; weakening of the social cohesion;
- a retreat of the state, sexual revolution, decline in authoritarianism;
- a growing symmetry in gender roles and increasing female economic autonomy; and
- a de-standardization of the life course and a greater diversity of lifestyles.

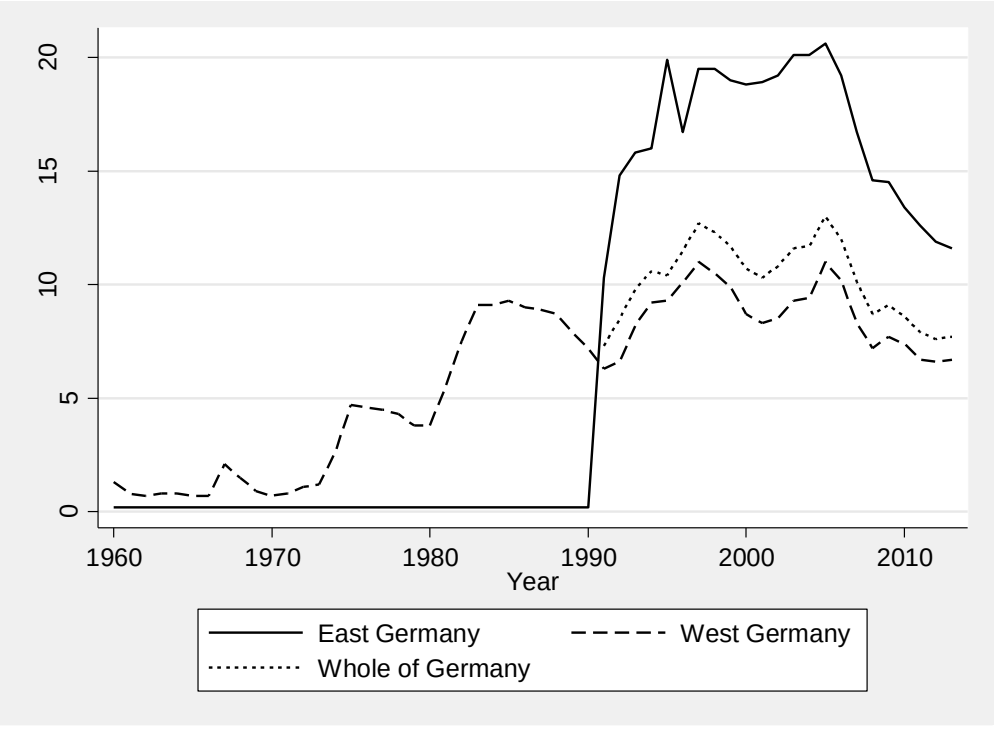
1.4.6.2 The Developments After the Fall of the Wall

The reunification of the two German states at the beginning of the 1990s was, unlike the term "reunification" suggests, primarily a structural integration of the former GDR into the FRG (Mayer & Schulze, 2009a). During this process, East Germany adopted not only the West German law and its currency, but also all political and institutional structures. People in the GDR were facing a sudden high level of social and economic uncertainty. The transformation affected all areas of life and changes happened at an historically unprecedented pace (Grünert & Lutz 1996: 69).

1.4.6.2.1 High Unemployment Rates in East Germany after Unification

Within two years after the German unification, the number of persons who were employed in East Germany decreased from 8.9 million in November 1989 to 6.7 million in November 1991. Until November 1994, the number of persons who were employed even dropped to two-thirds of the level in November 1989 (Brinkmann & Wiedemann 1995: 325). This unprecedented magnitude and pace of destruction of jobs and occupations in East Germany led to a period of mass unemployment in a region where unemployment was virtually unknown (see Figure 1.7) (Mayer & Schulze, 2009 ; Sackmann, Weymann & Wingens, 2000; Sackmann, Struck, Weymann, Windzio & Wingens, 2000; Weymann, Sackmann & Wingens, 1999). Especially women, older people and low-skilled workers were affected by this dramatic economic transition. A comparison of the trends in unemployment rates between East and West Germany shows that the unemployment rate in East Germany has declined in subsequent years (see Figure 1.7). However, until today,

Figure 1.7: Unemployment rates for East and West Germany



Source: Bundesagentur für Arbeit (2014)

the unemployment rate in East Germany is still about two times as high as the unemployment rate in West Germany.

1.4.6.2.2 The Convergence of Fertility Rates in East and West Germany After the Transformation Shock

The social and economic transformation shock and the massive uncertainty on the labour market immediately after the German unification have influenced the fertility behaviour of East Germans massively. Figure 1.2 shows that the total fertility rate in East Germany went down from 1.52 before the German unification to 0.84 in the mid-1990s. In the second half of the 1990s, there has been a catch-up process by the East German population resulting in a convergence of the East and West German fertility rate by the year 2000. Since then, the total fertility rate has been on a stable level of about 1.3 children per woman in the unified Germany (see Figure 1.2). As compared to international standards, this is a very low fertility level. Today, Germany is classified as a "very low fertility country" in cross-national comparisons (Billari & Kohler, 2004; McDonald, 2009). McDonald (2009) shows that the fertility rates in many industrialized countries have risen significantly over the last decade, whilst the fertility rate in the "very low fertility countries" such as Germany remained at a constantly low level. The consequences of this low fertility rate are drastic: "[...] A fertility rate of 1.3 reduces the generation size in 90 years to 25 per cent of its original size." (McDonald 2009).

Yet, not only the total fertility rates of the two Germanies have converged. Also the age at first birth and the age at entry into first marriage aligned. Whilst women in the GDR have entered into motherhood and marriage at a comparatively young age, women in the FRG were much older when these family events happened (see Figure 1.8 and Figure 1.9). Since the German unification, East German women have adapted to the West German family formation behaviour. In other words, both East and West German women are increasingly delaying their entry into motherhood and their entry into marriage over

the life course. In the year 2000, as illustrated by Figure 1.8 and Figure 1.9, women from East Germany on average, gave birth to their first child and entered into marriage at the age of 28. West German women experience these events when they are about 29 years old.

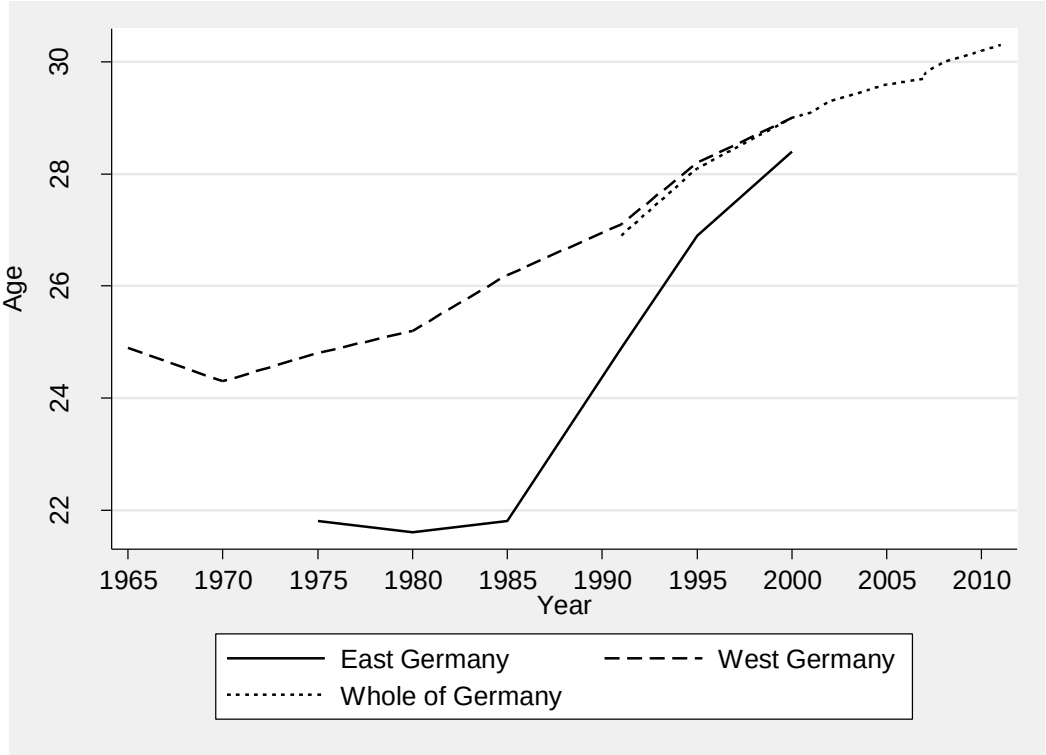
A similar convergence can be observed for the divorce rates. As mentioned above, the GDR was facing a massive increase in divorce rates in the 1970s (see Figure 1.6). The unification process and the resulting transformation shock as well as the increase in uncertainty, lead to a temporary decrease in divorce rates until 1995. After 1995, the divorce rates in East Germany began to rise again. And both East and West Germany were facing increasing divorce rates until about 2005. Afterwards, the divorce rates in both parts of Germany started to decline slightly. Nowadays, West Germany has a slightly higher divorce rate than East Germany (see Figure 1.6).

1.4.7 Summary

In summary, there used to be a strong gender division of work within and outside of the family in Germany for centuries. The separation of Germany, with the different political regimes in the GDR and FRG after World War II, has not changed anything about the gender role division within families. Even today, women in East and West Germany are predominantly responsible for childrearing and housekeeping (Grunow, 2013). Men, in both parts of Germany, on the other hand have always been in full-time employment throughout most parts of their adult lives and their roles and tasks within families and on the labour market have not changed much over the last few decades.

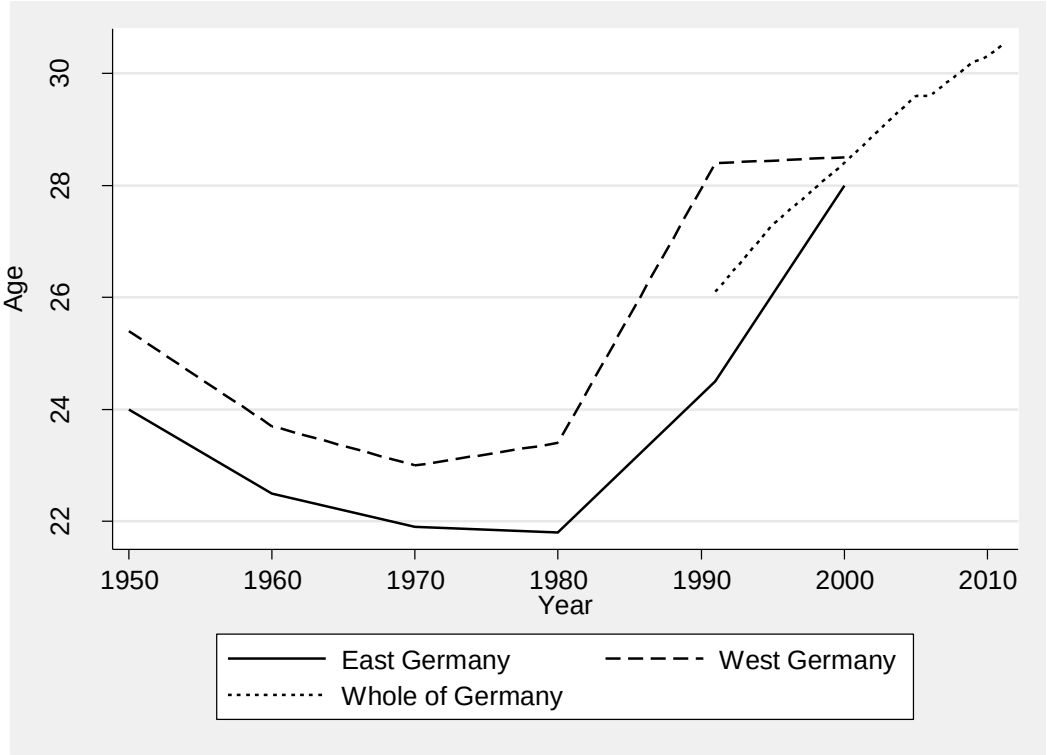
Since the end of World War II, the crucial change has been that married women are increasingly participating in the labour market in addition to their family obligations. Otherwise said, gender role changes have been generally asymmetric, with a greater movement of women into the traditional male sphere than vice versa (Blossfeld & Drobnic, 2001).

Figure 1.8: Age at first birth in East and West Germany, from 1965 to 2011



Source: Statistisches Bundesamt (2013)

Figure 1.9: Women's mean age at first marriage in East and West Germany, from 1950 to 2011



Source: Statistisches Bundesamt (2013)

Hence, women in Germany as in many other modern societies are facing the problem of a double burden and have to struggle to reconcile family and work demands (Grunow, 2013). The diverse political systems in East and West Germany, however, have produced differences between East and West German women. In East Germany, women have been integrated into the labour market by full-time employment since the end of World War II, whilst women in West Germany have mostly experienced a shift from being a housewife to being a part-time working secondary earner. The dramatic transformation processes in the 1990s have resulted in mass unemployment in East Germany immediately after German reunification. This was a shocking experience for East Germans since unemployment was unknown in the socialist system. Although unemployment in East Germany has decreased significantly until today, it is still twice as high as in West Germany. Today, East German women have a much higher labour force participation rate, especially in mid-life and they are more often employed full-time. West German women attempt the reconciliation of family and work demands mainly by part-time employment.

Today, the political differences between the FRG and the GDR are still reflected by a different regional distribution of childcare, particularly for children up to the age of three. These differences are likely to affect the reconciliation of work and family life for women in East and West Germany. For East German women, it is still easier to combine (full-time) employment and family demands. The differences in the total fertility rates of East and West German women have greatly disappeared. Nowadays, cohabitation is widespread in East and West Germany. However, cohabitation has a different meaning in both parts of Germany. In East Germany, it is already an alternative to marriage while in West Germany it is still considered a trial period for marriage. As a result, the proportion of out-of-wedlock births in East Germany is much higher than in West Germany today (Goldstein et al. 2010).

Against the background of this socio-economic and demographic history in Germany, we analyse the links between education, labour force participation and family events for women in Germany born between 1944 and 1986. Thus, our longitudinal analysis covers not only large parts of the German history before and after German unification but also includes the most recent developments in the unified Germany.

1.5 A Longitudinal Approach

This thesis utilizes longitudinal data and applies a longitudinal approach in order to examine family events in women's life courses in East and West Germany. Longitudinal data have the advantage that they track the same individuals over time and therefore allow us to analyse changes over their life courses. In life course research, longitudinal data are typically collected retrospectively or prospectively. Retrospective studies ask questions about the individual life histories in the past with detailed timing information covering long spans of the life course. They usually collect relevant information in different life course domains on central events in the past for successive birth cohorts. In traditional prospective panel designs, the same units of a sample are observed, interviewed or tested at a series of discrete points in time (Blossfeld, Golsch & Rohwer, 2007). Each data collection point is called a panel wave. The advantage of prospective panel data is that they are not so much subject to recall errors as retrospective data and that they allow to test individuals as well as ask questions about individuals' plans and motivations which then can be linked to individuals' actual behaviour in future panel waves. In modern panel studies, prospective and retrospective data collection strategies are combined which means that, in addition to the panel information, histories before the first panel wave and between panel waves are collected retrospectively.

Longitudinal studies have important advantages over cross-sectional studies. First, these data allow comparative descriptions of life course processes at the individual level

for theoretically relevant social groups and birth cohorts. Two descriptive approaches are distinguished (Abbot, 2001). The first approach concentrates on the life path as a whole and tries to identify typical patterns (see e.g. sequence analysis). The second approach concentrates on a particular life history as a realisation of a stochastic process and aims at the description of this process in terms of transition and survival rates (see e.g. life tables, multi-state life tables, and Kaplan-Meier estimators) (Willekens, 2014). Second, based on a theoretical model, longitudinal data offer information on events that are considered as the dependent processes and time-dependent covariates that are regarded as the independent ones (Mills, 2011; Willekens, 2014). With longitudinal data, it is then possible to take into account the temporal order of causal and effect events, so that one can link the changes in the independent processes happening in the past with the probability of events in the dependent processes in the present and the future. On the side of the independent processes, changes can happen at the micro level (e.g. changes in the duration dependence or events in other life domains), the meso level (e.g. changes at the family or firm level) and the macro level (e.g. changes in unemployment rates or changes in political regimes such as German unification). Thus, compared to cross-sectional data, longitudinal surveys offer life course researchers a better opportunity to reveal causal mechanisms. A third advantage of longitudinal data is that one can trace lag structures between causal and effect events as well as effect shapes over time (Blossfeld, Golsch & Rohwer, 2007). Finally, longitudinal data often offer the possibility to identify age, cohort and period effects (Mayer & Tuma, 1990). In summary, these advantages of longitudinal data allow us in this thesis to analyse female life course transitions in the historical context as well as the interdependence of educational, work and family events over the life course.

Nevertheless, longitudinal data have some important disadvantages. First, they are usually non-experimental observations of (long-term) social processes. Hence, they suffer from selectivities because individuals select themselves into certain life course states (e.g.

consensual vs. marital unions) or they are selected into specific states in a non-random way by institutions (e.g. when schools select their students) or by other factors (e.g. social origin, ethnicity or gender). If these selectivities are not observed or are even unmeasurable, there is the problem of unobserved heterogeneity which leads in event history models to spurious time-dependencies. Retrospective life history data often suffer from the fact that recall questions are limited to behavioural or factual questions. In addition, sometimes individuals have difficulties to recall the states or the exact timing of the state changes in their previous life courses. These autobiographic recall errors are often systematically correlated to individual characteristics such as education and gender (Peters, 1988; Smith & Thomas, 2003). Finally, retrospective studies are also limited to survivors. This can be particularly a problem among older birth cohorts, if only a small portion of men and women is still alive.

Prospective panel data have different problems. They are sensitive to the timing of the panel wave relative to the speed of the process under study. There is also the problem that panel studies often influence the processes they seek to observe (because individuals sometimes behave differently if they know they will be interviewed again in the future). One of the most important shortcomings of panel surveys is the problem of attrition. From one wave to the next, respondents may stop participating in the life course panel study in a systematic way (e.g. divorced people might refuse to participate in the next panel wave again; Lipps, 2007). As a result of systematic attrition, the estimates of statistical models might be biased. Furthermore, attrition might decrease the sample size significantly and thereby reduce the efficiency of the estimators. Attrition can have many reasons e.g. unit nonresponse, migration or mortality. Many well-established panel studies try to get the attrition problem under control, e.g. by investing more efforts to avoid drop-outs at all, by more systematically tracking down drop-outs repeatedly and by replacing drop-outs by additional samples. In addition, there are many tools that allow the researcher to cope

with the problem of attrition e.g. imputing the missing data (Rubin, 1976; 1987; 2000) or weighting for unit non-response (Heeringa et al., 2010).

1.6 The National Educational Panel Study (NEPS)

For the analysis of family events in Germany, there are many possible data sets available such as the PAIRFAM (since 2008), Fertility and Family Survey (FFS) (1992-2000), the Generations and Gender Survey (GGS) (2005, 2008/2009), the German Socio-Economic Panel Study (SOEP) (1984-today) and the European Community Household Panel (ECHP) (1984-2001). However, these longitudinal data sets do not offer all the information necessary for our analysis (e.g. PAIRFAM: historical developments cannot be measured, since the birth cohorts are too young, divorce processes cannot be measured due to the young age of the respondents) and are also not as recent as the National Educational Panel Study (NEPS) since their data collection has ended before 2010 (FFS and GGS).

In this thesis, we draw on data from the German National Educational Panel Study (NEPS)[1] (Blossfeld, Roßbach & von Maurice, 2011). This panel is carried out by the Leibniz Institute for Educational Trajectories and has been set up to study the acquisition of knowledge, skills and competencies over the life course in Germany and to examine the consequences of educational investments on other life course domains such as labour market participation, career opportunities, family and fertility histories, political participation, social commitment, physical and mental health as well as subjective well-being. Thus, the NEPS data allow us to describe central educational, work and family processes and trajectories over large parts of the life span of several cohorts.

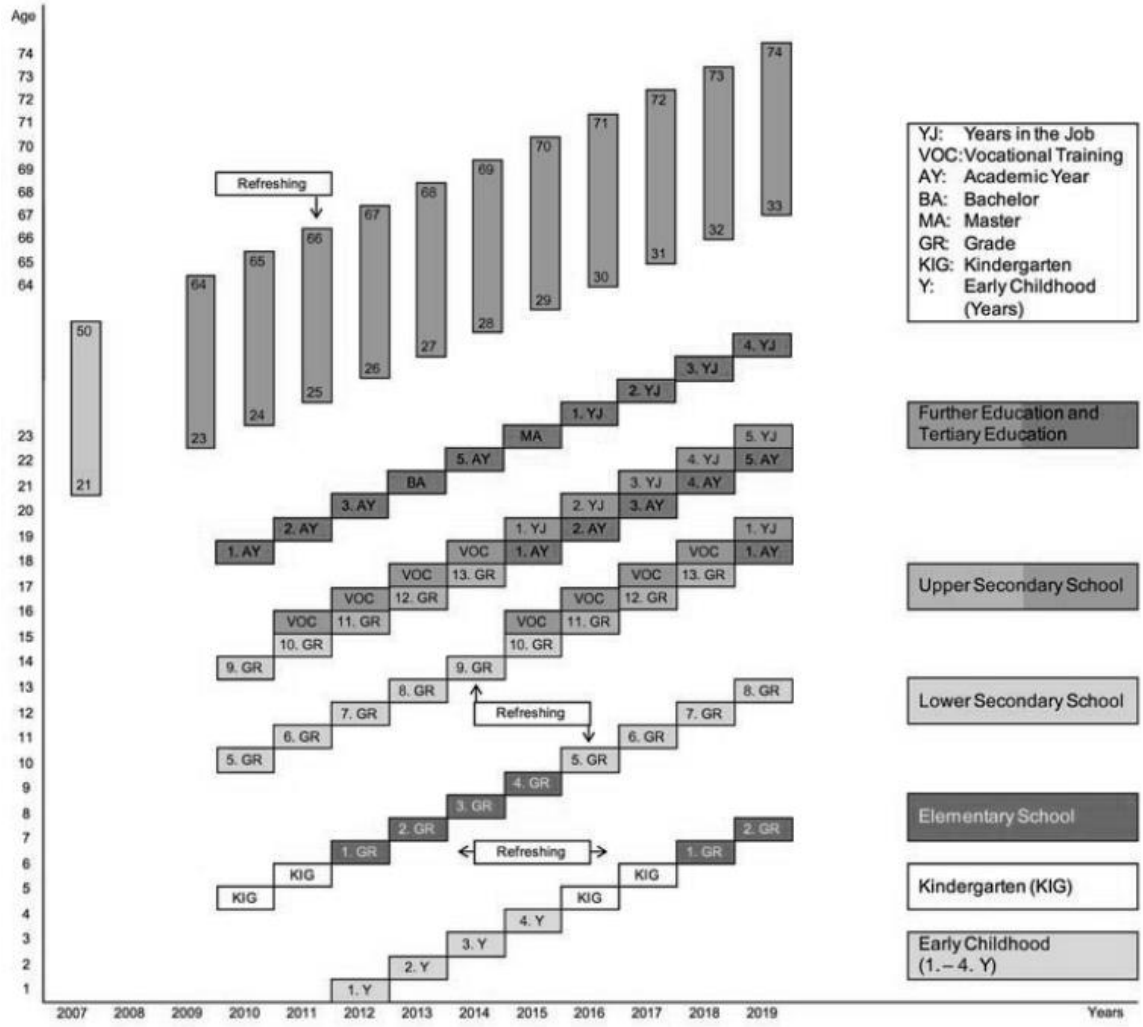
[1] *This thesis uses data from the National Educational Panel Study (NEPS): Starting Cohort 6 – Adults, doi:10.5157/NEPS:SC6:1.0.0. From 2008 to 2010, NEPS data were collected as part of the Framework Programme for the Promotion of Empirical Educational Research funded by the German Federal Ministry of Education and Research (BMBF). As of 2014, the NEPS survey is carried out by the Leibniz Institute for Educational Trajectories (LIfBi) at the University of Bamberg in cooperation with a nationwide network.*

Based on the structure of the German educational system, the NEPS panel conceptually divides educational careers into the following eight stages: (1) from birth to early child care; (2) from Kindergarten to elementary school; (3) from elementary school to lower secondary school; (4) from lower to upper secondary school; (5) from upper secondary school to higher education, vocational training, and the labour market; (6) from vocational training to the labour market; (7) from higher education to the labour market; and (8) on adult education and lifelong learning. For each of these eight stages, particular competence tests and questionnaires have been developed. The data are collected prospectively and retrospectively.

Methodologically, the NEPS applies a multi-cohort sequence design and started off with six separate cohorts (see Figure 1.10). The first four cohorts are selected to cover the major transitions in the German educational system over the life course: (1) from kindergarten to elementary school, (2) from elementary school to lower secondary school, (3) from lower secondary school to upper secondary school as well as (4) from upper secondary school to tertiary education. For these four cohorts, the yearly panel observations started in the year 2010. The second kind of cohorts is age-based. These are cohorts of new-borns (starting at the age of one year in 2012) and the adult cohort covering individuals aged between 23 and 64 in 2009 (see Figure 1.10). The data used in this thesis are based on the retrospective life histories of the adult cohort.

The NEPS target population of the adult cohort consists of all people in the age between 23 and 64 years living in private households in Germany in the year 2009 (see Figure 1.10). Access to this target population was achieved by a combination of three samples. The first sample of the NEPS adult cohort is the panel study “Arbeiten und Lernen im Wandel” (ALWA, Working and Learning in a Changing World) conducted by the Institute for Employment Research (IAB, PI Jutta Allmendinger) in 2007 that was

Figure 1.10: The multicohort sequence design of the German National Educational Panel Study

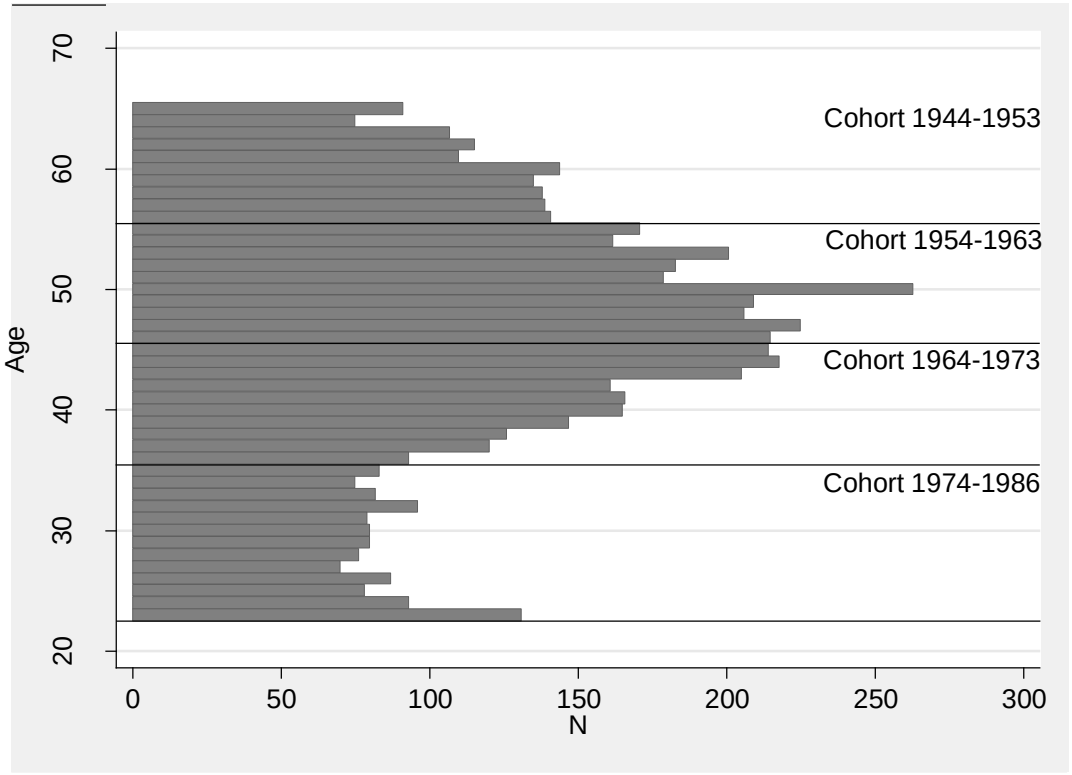


Source: Blossfeld, von Maurice & Schneider 2011: p.14

integrated into the NEPS in 2009 (Kleinert, Matthes & Jacob, 2008;) (see Figure 1.10). The ALWA panel initially recruited adults aged between 21 and 50 in 2007 (see Figure 1.10). These are the birth cohorts born between 1955 and 1986 (Antoni et al , 2010). In 2009, the second sample of the adult cohort in the NEPS is a refreshment of the ALWA study. Finally, the third sample of the NEPS adult cohort was drawn from the birth cohorts 1944 to 1954.

Initially, 11,649 respondents were surveyed in the NEPS adult cohort in 2009. The sample was selected by a two-stage cluster sampling approach (Aßmann et al., 2011). The elementary sampling points were defined as the 12,429 German municipalities existing in

Figure 1.11: Female age structure in the NEPS data at the time of the interview



Source: Estimations based on NEPS data from the adult cohort

2008. Stratification according to federal states and a classification of urbanization (BIK scale) was applied in the sampling procedure (Aßmann et al., 2011). For a more detailed description of the conceptual framework, the basic dimensions of the questionnaires and competence tests as well as the logic of the NEPS data sets we refer the reader to Blossfeld, Roßbach and von Maurice (2011). Furthermore, a detailed description of the exact wording of the question and response rates can be found in the Appendix. This thesis uses educational, employment, family and fertility trajectories of 5,340 female respondents born in East (N=1,182) and West Germany (N=4,158). Since we are interested in the specific interaction of education, work and family events in women's life courses, we focus our analysis only on women. Of course, we include information on the male partners of these women in our analysis. Because migrants are a very specific and heterogeneous group and cannot be appropriately controlled for due to the small number of cases in the NEPS, we excluded women who were not born in Germany from our analysis.

Table 1-4: Family status of the female respondents at the time of the interview, by cohorts, for the whole of Germany, East and West Germany (in per cent)

Family status	Cohort				Total
	1944-1953	1954-1963	1964-1973	1974-1986	
Germany as a whole					
Single	4	4	8	35	10
Cohabiting	2	2	3	20	5
Married	9	6	6	7	7
Divorced	2	1	1	0	1
Single parent	5	4	4	5	4
Cohabiting with a child	4	4	7	6	5
Married with a child	65	73	66	26	63
Divorced with a child	9	6	5	1	5
Total	*100*	*100*	*100*	*100*	*100*
West Germany					
Single	4	4	8	39	11
Cohabiting	2	2	4	20	6
Married	9	8	7	7	8
Divorced	2	1	1	0	1
Single parent	5	4	4	3	4
Cohabiting with a child	4	4	4	4	4
Married with a child	65	71	67	26	61
Divorced with a child	9	6	5	1	5
Total	*100*	*100*	*100*	*100*	*100*
East Germany					
Single	4	3	5	23	7
Cohabiting	0	1	2	19	4
Married	7	2	3	5	4
Divorced	1	1	0	0	0
Single parent	6	6	4	10	6
Cohabiting with a child	5	6	15	12	9
Married with a child	69	76	65	30	64
Divorced with a child	8	5	6	1	6
Total	*100*	*100*	*100*	*100*	*100*

Source: Estimations based on NEPS data from the adult cohort

A first overview of the age structure of female respondents in our data set at the time of the interview is given in Figure 1.11. It reflects the major demographic changes in Germany across birth cohorts. Figure 1.11 shows that the number of women by birth cohorts is increasing from the 1944 cohort to the 1962 cohort and is subsequently decreasing for the younger birth cohorts. This distribution of women across cohorts reflects the increasing fertility (Baby Boom) from birth cohorts 1944 to 1962 and the declining fertility (Ba-

by Bust) in the subsequent birth cohorts in Germany. Among the youngest cohort, there is a small recovery. The female age structure in the NEPS adult cohort is identical to the age pyramid as documented by the Official Statistics in Germany (Statistisches Bundesamt, 2013).

Table 1-4 describes the family status of the female respondents in the NEPS adult cohort at the time of the interview by birth cohort for Germany as a whole and separated for East and West Germany. It can be seen that the proportions across the different family forms are surprisingly similar in East and West Germany for the four birth cohorts. This family structure is in agreement with data from the Federal Statistical Office in 2014 (Destatis, 2014). The majority of the females is married and has children. There is very little change with regard to the proportions of single women (with or without a child), cohabiting women (with or without a child), married women (with or without a child) and divorced women (with or without a child) over the older three birth cohorts. Only the youngest cohort is very different from the three older cohorts. It has a higher proportion of single and cohabiting women, which might be explained by a cohort or life course effect. In the next chapters of this thesis, we will analyse these demographic changes in more detail.

1.7 Event History Analysis

In this thesis, we are interested in demographic processes that are characterized by individuals who are moving among a small number of theoretically important states and where the changes between the states (or the events) may occur at any point in time (Coleman, 1981). The definition of a possible set of states, which is called state space, and the choice of the time axis (e.g. age, experience, marriage duration, etc.) are therefore dependent on substantive considerations (Blossfeld, Golsch & Rohwer, 2007; Mills, 2011). A careful choice of the time axis and the design of the state space are crucial for a

successful life course analysis. An episode, a waiting-time or a spell is the time span an individual spends in a specific origin state until the individual moves to a destination state or is right-censored. The most restricted event history analysis is based on a process with only a single episode and two states (origin and destination state). An example may be the duration (episode) of a first marriage until the end of this first marriage (for whatever reason). We consider the individuals as exposed to the 'risk' of experiencing an event that will end the episode ('risk set'). For example, women can enter into consensual unions, marriages and motherhood at virtually any point in time of their adult life course. If more than one destination state exists (e.g. entry into consensual unions vs. entry into marital unions), these models are referred to as multistate or competing risk models. If there are repeated events over the life course, these models are called multi-episode models. For example if we would analyse not only first marriages but all marriages of individuals over their life course at once. The individuals move then repeatedly between different states.

In event history analysis, we often have a sample of i = 1,...,N episodes. These spell data are typically defined by

$$(u_i, m_i, o_i, d_i, s_i, t_i, \mathbf{x}_i) \qquad i = 1,\ldots,N$$

where u_i is the identification number of the individual; m_i is the serial number of the episode (e.g. the number of the marriage); o_i is the origin state (e.g. being married); d_i is the destination state (e.g. being divorced); s_i is the starting time (e.g. the beginning of the marriage duration, with is equal to zero) and t_i is the ending time (e.g. the end of the marriage duration). In addition, there is a covariate vector $\mathbf{x}_i$ with time-constant and/or time-changing factors associated with the episode. We always assume that the starting and ending times are coded such that the difference $t_i - s_i$, which is the duration of the episode, is positive (and greater than zero).

In the NEPS data, spells are sometimes right censored because individuals have not (yet) experienced the event of interest until the time of the retrospective life course interview or the last panel observation. For example, married women who have not yet experienced a divorce have a right-censored episode. Since the timing of the interview is normally independent of the timing of the substantive processes under study, this type of right censoring is unproblematic. It can easily be handled with event history methods. If the length of time an individual has already spent in the origin state is unknown, the episode is censored on the left. Left censoring, which is methodologically more problematic, cannot occur in the retrospective event history data of the NEPS adult cohort, since the life course processes are all recorded right from the beginning.

Even though in theory, an event could happen at any point in time and therefore a continuous time axis is assumed, this is only an idealized representation of social time. The NEPS only collects time information on a monthly basis. Event history models can be formulated in continuous-time (Blossfeld et al., 2007) or discrete-time (Allison, 1984; Yamaguchi, 1991; Vermunt, 1997; Mills, 2011). In this thesis, we only estimate discrete-time event history models.

In discrete event history models, events can only happen within fixed time-intervals. Using the NEPS data, the time axis of our models can be split into a series of monthly time intervals $\tau_0 < \tau_1 < \tau_2 < \ldots < \tau_q$, with $\tau_0 = 0$. The number of the time interval then becomes a discrete random variable $T = t \Leftrightarrow T \in [\tau_{t-1}, \tau_t)$, with $t = 1,\ldots, q$. Since we are studying the occurrence of single non-repeatable events (e.g. first marriage, first motherhood, or first divorce) in the four empirical chapters of this thesis, we have only one episode for each woman at risk. This person-level spell data is then transformed into person-period data using the method of episode splitting (Singer & Willett 1993), in which each woman i has multiple sub-episodes – one for each month – until the event occurs or the sub-episode is

censored. The chronology of event occurrence for each woman i can be conveniently recorded using a sequence of dummy variables Y_{ij} whose values y_{ij} are defined as (Singer & Willett 1993:168):

$$y_{ij} = \begin{cases} 0 & \text{if a woman i does not experience the event in month j} \\ 1 & \text{if a woman i does experience the event in month j} \end{cases}$$

Y_{ij} is the dependent variable in discrete-time event history models and also the variable containing the censoring information. The discrete-time transition rate is then a conditional probability

$$r(t) = \Pr(T = t \mid T \geq t) \qquad \text{with } 0 \leq r(t) \leq 1$$

r(t) is defined as the probability that the dependent variable changes from the origin state to the destination state in time interval t under the condition that the event did not yet happen until the beginning of that interval. In the discrete-time model the transition rate r(t) is therefore a conditional probability function, where the probability function f(t) is divided by the survivor function G(t)

$$r(t) = \frac{f(t)}{G(t)}$$

where

$$f(t) = \Pr(T = t)$$

and

$$G(t) = \Pr(T \geq t)$$

Given event history data from the NEPS adult cohort, we want to describe the process of change, discover the causal relationships among events and assess their importance. The central idea in event history analysis is therefore to make the discrete-time transition

rate r(t) dependent on concepts of time (e.g., duration t), a set of time-constant covariates **x** (e.g. place of birth or partner's educational attainment level) and time-dependent covariates **x**(t) (e.g. educational enrolment, historical periods or unemployment rate)

$$r(t) = g(t, \mathbf{x}, \mathbf{x}(t))$$

The causal interpretation of the transition rate requires that we take the temporal order in which the life course processes evolve very seriously. In any given time interval t, the discrete-time transition rate r(t) can be made dependent on conditions that occurred before the beginning of interval t, but not on what is the case in time interval t or after time interval t.

The estimation of the effects of the time-dependent covariates is achieved by the transformation of the person-spell file into a period-person data file through episode splitting (for a detailed description see Singer & Willett, 1993 and Blossfeld et al., 2007). Such a person-period data set allows us an easy integration of time-varying covariates because the covariates can change their values across each of the person-month records. We then can estimate a logit model

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

or

$$r(t) = \frac{ab(t)}{1 + ab(t)}$$

with $a = \exp(\alpha_1 x_1 + \alpha_2 x_2 + \ldots + \alpha_n x_n)$ and $b(t) = \exp(\beta(t))$. If $b(t) = \exp(\beta_0)$, the logit model estimates an exponential model. A piecewise constant model $b(t) = \exp(\beta_l)$ is estimated if the duration is split into L time periods $I_t = \{t \mid \tau_l < t \leq \tau_{l+1}\}$, $l = 1,\ldots,L$ based on arbitrary split points on the time axis $0 = \tau_1 < \tau_2 < \ldots < \tau_L$, with $\tau_L = \infty$. The transition

rate can then vary over the $l = 1,\ldots,L$ time periods based on the changing period-specific constants β_l (if $t \varepsilon I_l$).

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2 Living Arrangements and the Birth of a First Child in the Early Life Course: A Description Based on the NEPS

The previous chapter provided an overview of the historical developments of women's changing roles as well as the long-term trends in marriage, birth and divorce patterns in Germany. We demonstrated that East and West Germany, like many other European countries, experienced an increase in the age at first marriage along with a decline in marriage rates. Despite this delay in entry into marriage, young adults continue to set up households with partners (Konietzka & Kreyenfeld, 2005; Nazio, 2008). In fact, there has been a rapid rise of cohabitation, especially for young couples (Baizán et al., 2002; Brüderl et al., 1999; Mayer & Schulze, 2013; Nazio, 2008; Nazio & Blossfeld, 2003). This might not only have an effect on the transitions between partnership states but also on the living arrangements in which women have their first child. Using data from the NEPS, the first goal of this chapter is to follow up women's sequences of different partnership states over the life course (principle of timing of events and transitions, see Chapter 1.3) across birth cohorts in East and West Germany as well as the whole of Germany (principle of place and time, see Chapter 1.3). The second goal is to describe the change in the timing of entry into marriage over the life course for different birth cohorts in East and West Germany. Finally, we focus on the relationship between living arrangements and entry into first motherhood (principle of linked lives, see Chapter 1.3) over the life course across successive birth cohorts for East and West German women (principle of place and time, see Chapter 1.3).

2.1 The Sequences of Partnership States over the Early Life Course in East and West Germany

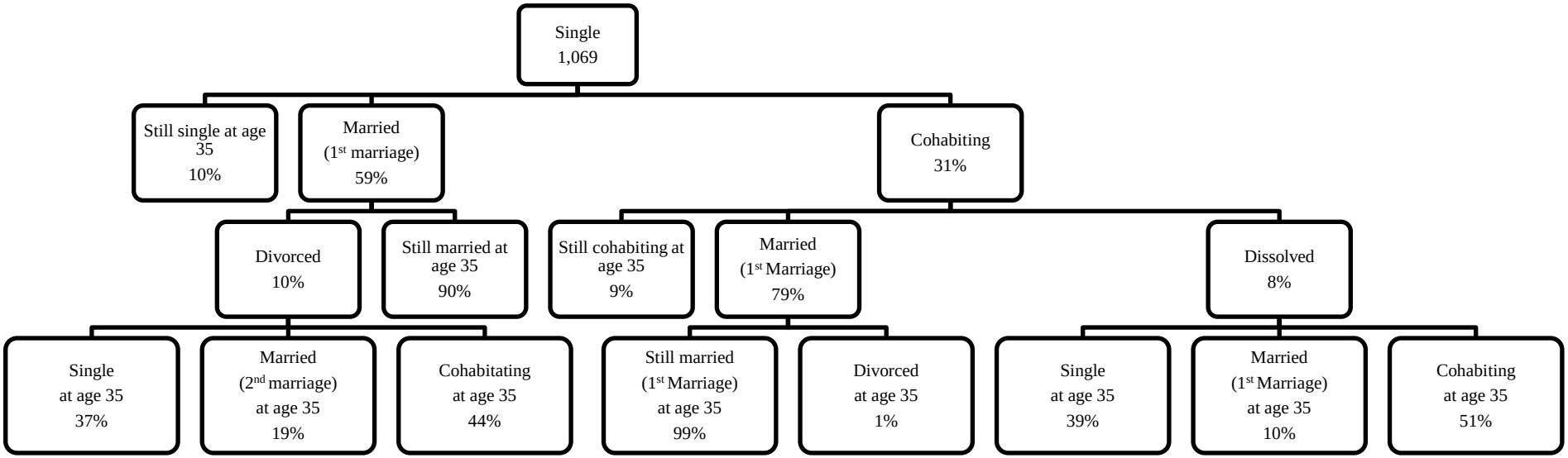
To describe women's pathways through living arrangements over the early life course, we construct a state space with six possible states (see Figures 2.1-2.7): (1) single; (2) cohabiting; (3) dissolved; (4) married (1st marriage); (5) divorced; and (6) married (2nd mar-

riage). Based on this state space, we describe the sequence of partnership states a woman may occupy up to age 26 and up to age 35 in East Germany, West Germany and the whole of Germany. We distinguish between these two age spans, since it is well known that transitions into partnerships tend to happen more often at younger ages for East than for West German women (Statistisches Bundesamt, 2012). Moving straight into a marriage is definded as women without previous cohabitation of those women who moved in with their partner maximally two month before marriage. The pathways start with the state of being single. A woman may change the state for one of four reasons (see Figures 2.1-2.7). The first one is entry into cohabitation, the second one is entry into marriage, the third one is exit from cohabitation (separation) and entry into marriage, cohabitation or living again as a single, and the fourth one is exit from 1st marriage (divorce) and entry into 2nd marriage, cohabitation or living again as a single. Living arrangements, such as living apart together, cannot be studied here, since information on the residence status of the partners is not available in the NEPS data.

We start with the description of the sequence of transitions between partnership states for women in Germany as a whole, distinguishing three different birth cohorts up to age 35 (see Figures 2.1, 2.2 and 2.3). These figures show that in all cohorts approximately 90 per cent of the women of each cohort reported to have had at least one partnership until the age of 35. Expressed differently, only about 10 per cent of women in each cohort have remained single (in terms of not having entered into any cohabitation or marriage) until they turned 35.

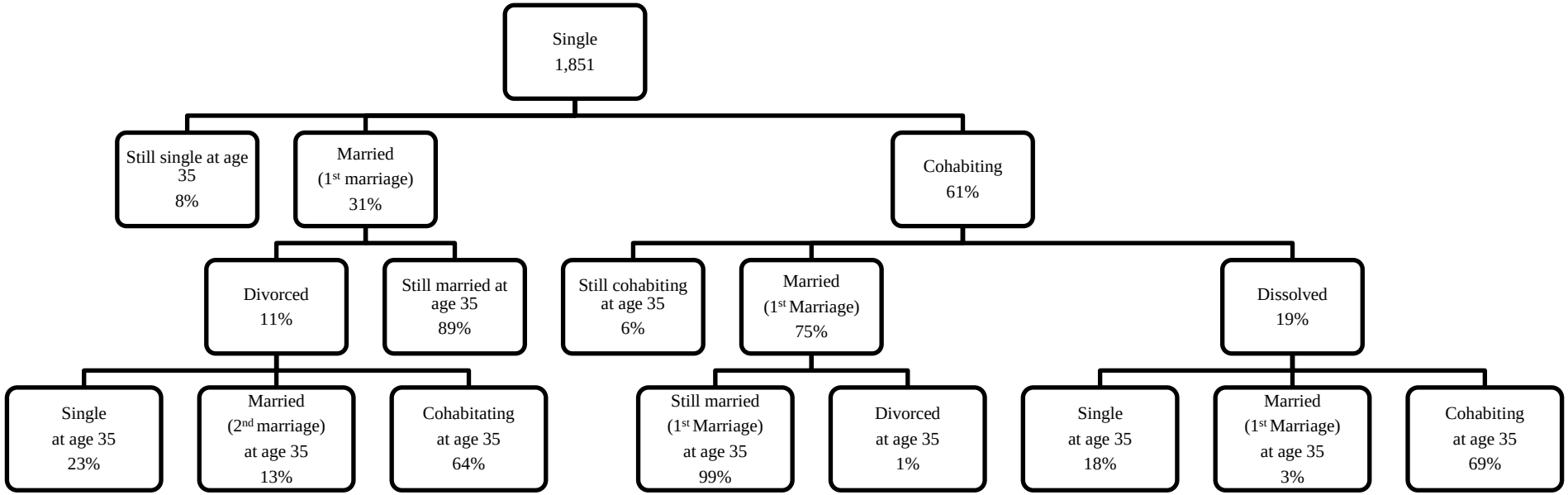
While 59 per cent of German women born between 1944 and 1953 (see Figure 2.1) entered straightly into marriage without previous cohabitation, only 31 per cent of women in birth cohort 1954-1963 (see Figure 2.2) and 16 per cent of women born between 1964 and 1973 (see Figure 2.3) did so. To put it differently, direct entry into marriage declines

Figure 2.1: Transitions between partnership states in Germany up to age 35 (birth cohort 1944-1953)



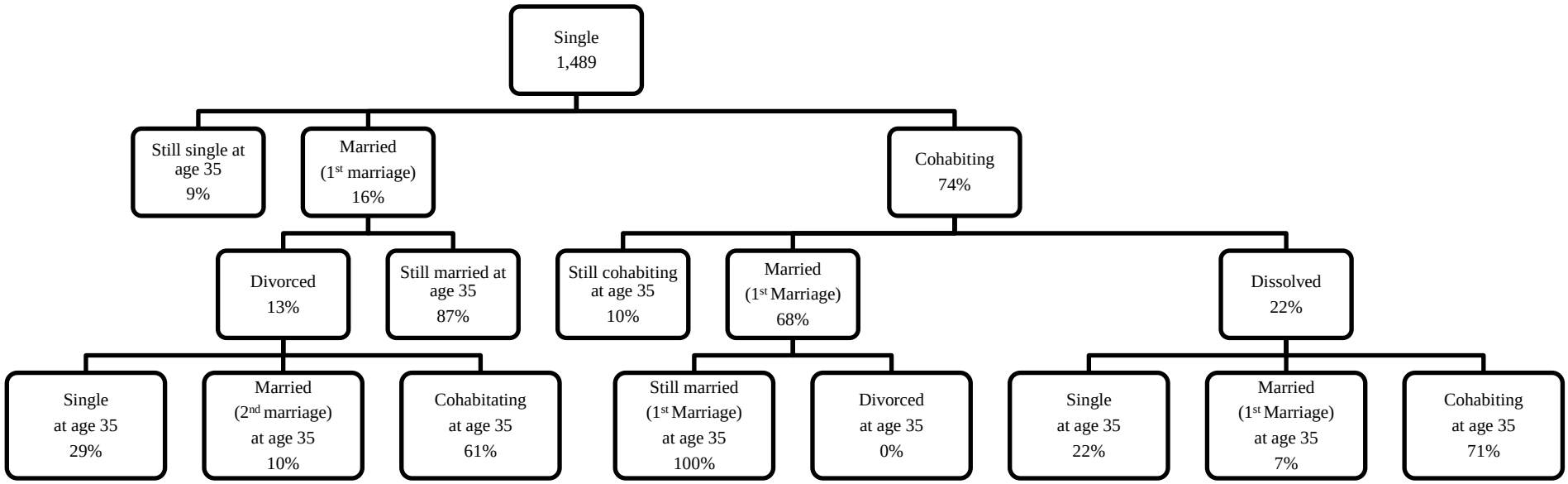
Source: Estimations based on NEPS data from the adult study

Figure 2.2: Transitions between partnership states in Germany up to age 35 (birth cohort 1954-1963)



Source: Estimations based on NEPS data from the adult study

Figure 2.3: Transitions between partnership states in Germany up to age 35 (birth cohort 1964-1973)



Source: Estimations based on NEPS data from the adult study

strongly in Germany. At the same time, the proportion of women who entered into cohabitation as a first union rose from 31 per cent in birth cohort 1944-1953 (see Figure 2.1) to 61 per cent in birth cohort 1954-1963 (see Figure 2.2) and to 74 per cent in birth cohort 1964-1973 (see Figure 2.3). This development suggests that the normative pressure to enter directly into marriage has declined across cohorts and cohabitation has become increasingly accepted as a first living arrangement in Germany. However, marriage still seems to be an important goal in German women's lives, even if the proportion of cohabiting women who enter into marriage later in their life course is slightly declining. Figures 2.1, 2.2 and 2.3 show that for the majority of German women cohabitation is only a temporary phase before marriage since 79 per cent of women in birth cohort 1944-1953 (see Figure 2.1), 75 per cent of women in birth cohort 1954-1963 (see Figure 2.2) and 68 per cent of women in birth cohort 1964-1973 (see Figure 2.3) have transformed their cohabiting unions into marriages up to age 35. Only about 10 per cent of cohabiting women did not change their status up to age 35. These cohabitations seem to have got the character of an alternative living arrangement to marriage.

Figures 2.1, 2.2 and 2.3 also show a higher instability of cohabitation compared to marriage. This suggests that cohabitation in Germany is still a living arrangement with a lower commitment than marriage. In addition, the proportion of cohabiting women who separate is increasing from eight per cent in birth cohort 1944-1953 (see Figure 2.1) to 19 per cent in birth cohort 1954-1963 (see Figure 2.2) and to 22 per cent in birth cohort 1964-1973 (see Figure 2.3). This increase in the instability of cohabitation across cohorts suggests that cohabitors are still a selective group in the process of expansion of nonmarital unions. It seems that individuals who have a higher propensity to separate are still selecting themselves more into cohabitation rather than marriage. Only a small minority of women who have experienced the dissolution of their cohabitation enter into marriage. An increasingly greater majority of these women enter into another cohabitation: 51 per

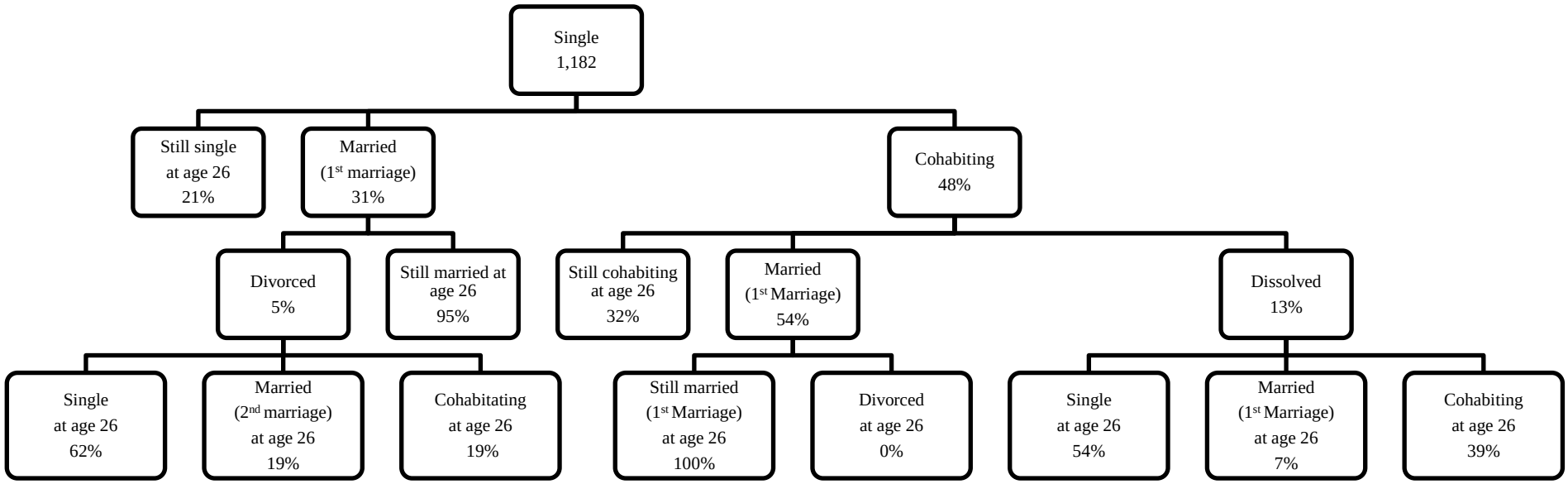
cent in birth cohort 1944-1953 (see Figure 2.1), 69 per cent in birth cohort 1954-1963 (see Figure 2.2) and 71 per cent in birth cohort 1964-1973 (see Figure 2.3). About 20-40 per cent of the women who experience the dissolution of cohabitation stay single until the age of 35.

If we look at women who have entered directly into marriage (without previous cohabitation) in Germany, we can observe that the proportion of women who are divorced remains constant at a surprisingly low level across the successive birth cohorts (see Figure 2.1, Figure 2.2 and Figure 2.3). Only about 10 per cent of these women dissolve their marital unions (see Figure 2.1, Figure 2.2, Figure 2.3), whereas the majority of these women (about 90 per cent) is continuing to be married until age 35. Thus, while entry into marriage is declining across cohorts, the marriages have been quite stable over the life course.

In summary, the proportion of single women in Germany as a whole remains constant across the successive birth cohorts, while there is a strong shift from direct entry into first marriage (without previous cohabitation) to cohabitation as a first type of union over successive birth cohorts. However, most of the cohabiting women eventually enter into first marriage so that the great majority of German women is married by age 35. Nevertheless, the proportion of cohabitations that are turned into marriages slightly declines across birth cohorts so that the share of cohabiting women is on the rise at age 35.

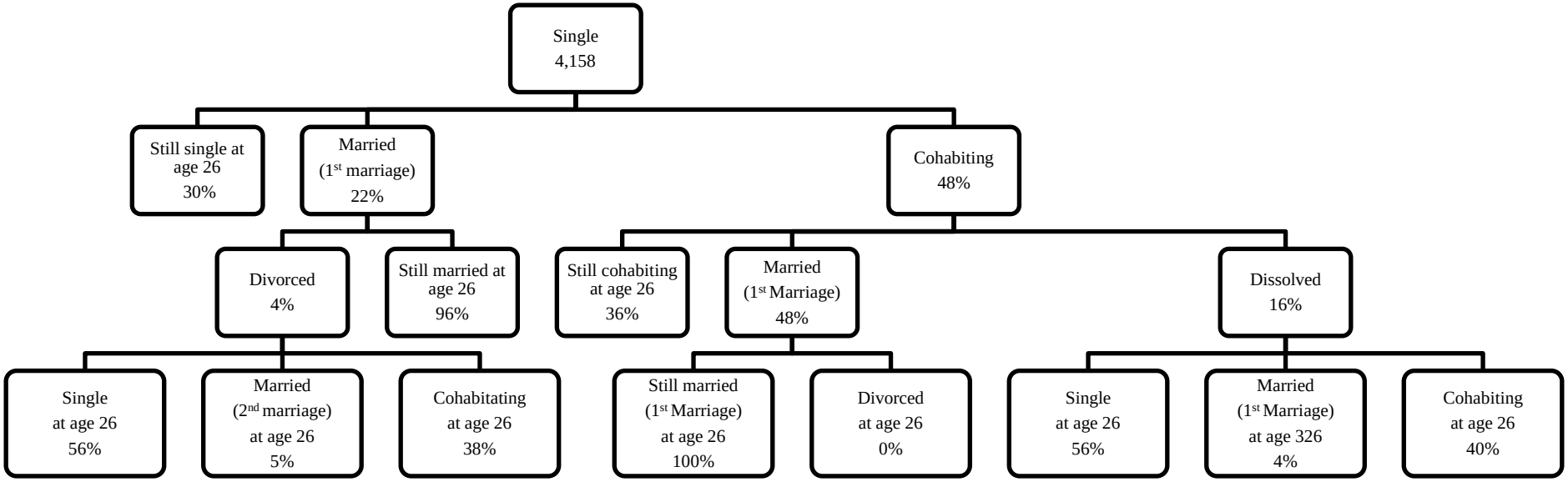
To assess the differences in the pathways of living arrangements in the life courses of women in East and West Germany, we describe the sequences of partnership states separately for women born in East and West Germany. We proceed in two steps. First, we describe the differences in early family formation and follow up women who are born between 1944 and 1986 only until the age of 26 (Figure 2.4 and Figure 2.5). Then, we look at the differences at an advanced stage of the family formation process by comparing East

Figure 2.4: Transitions between partnership states in East Germany up to age 26 (born between 1944-1986)



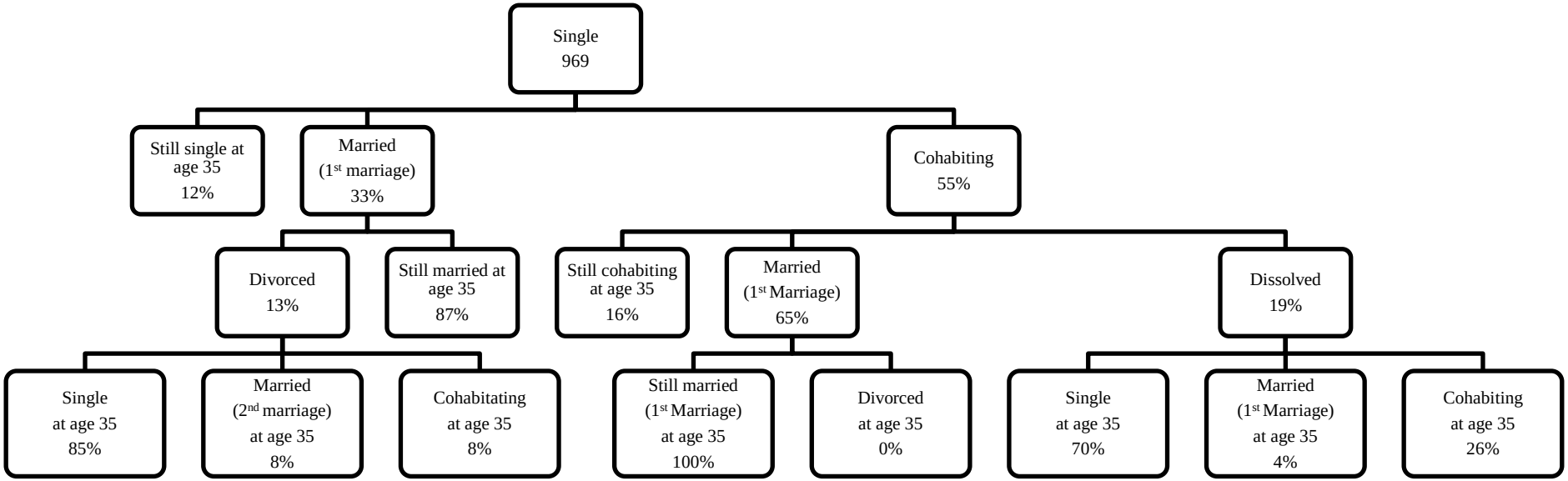
Source: Estimations based on NEPS data from the adult study

Figure 2.5: Transitions between partnership states in West Germany up to age 26 (born between 1944-1986)



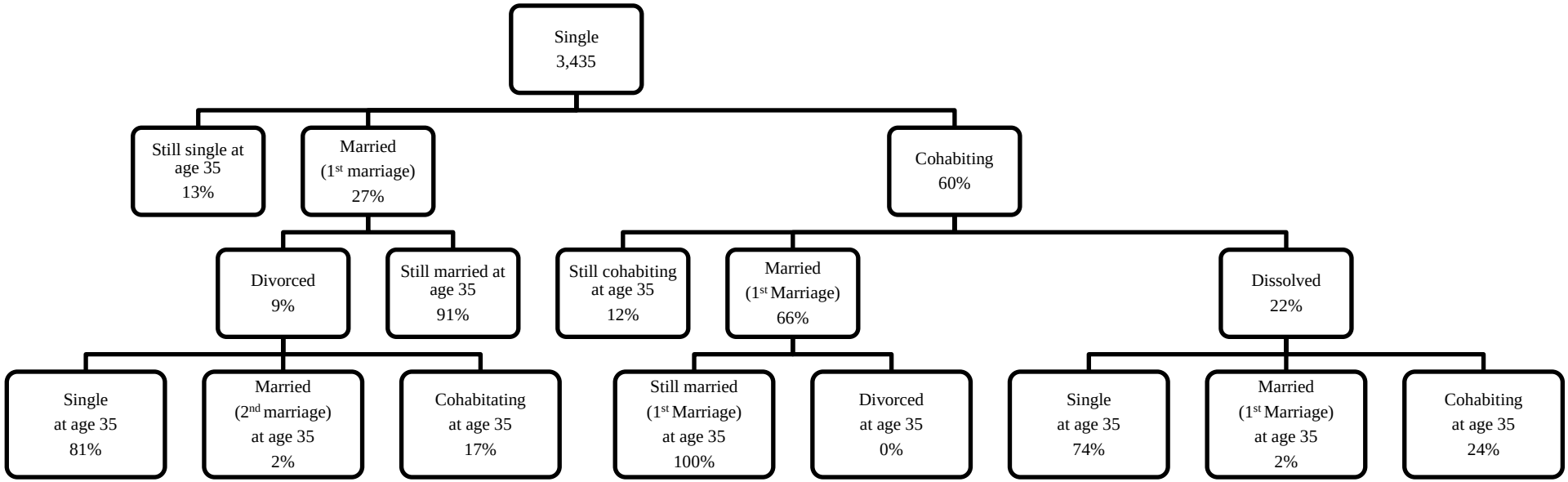
Source: Estimations based on NEPS data from the adult study

Figure 2.6: Transitions between partnership states in East Germany up to age 35 (born between 1944-1973)



Source: Estimations based on NEPS data from the adult study

Figure 2.7: Transitions between partnership states in West Germany up to age 35 (born between 1944-1973)



Source: Estimations based on NEPS data from the adult study

and West German women who are born between 1944 and 1973 until the age of 35 (Figure 2.6 and Figure 2.7).

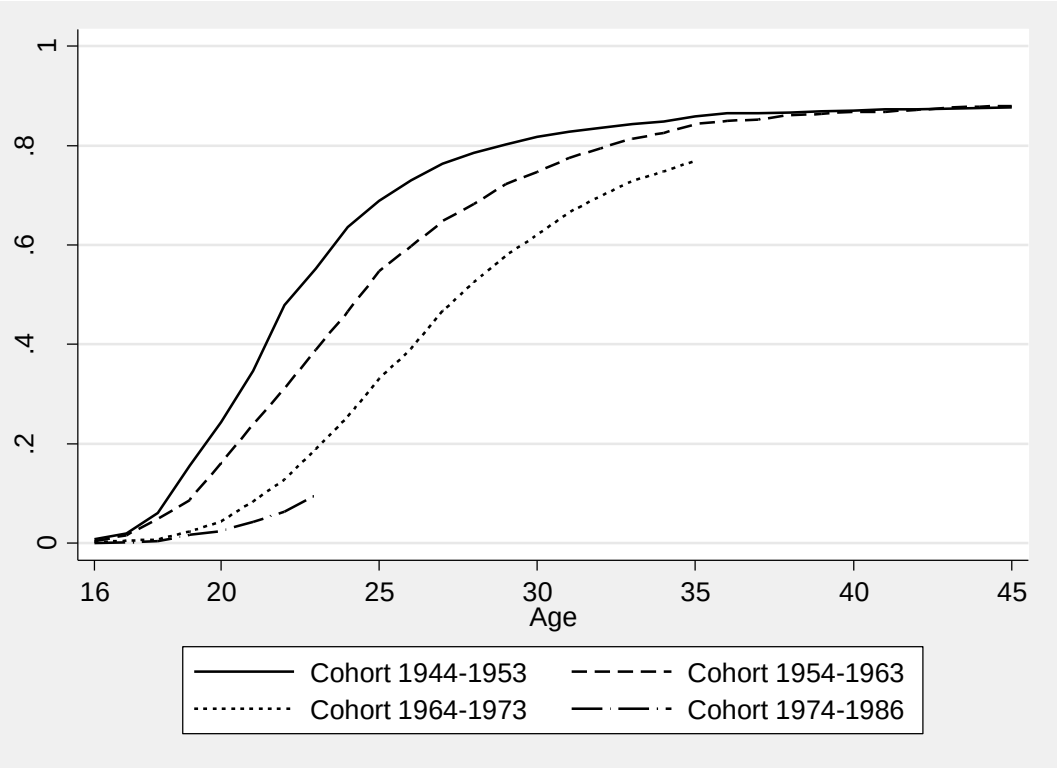
If we follow-up women until the age of 26, we see that East and West German women are very similar in terms of cohabitation. This supports the results shown by Nazio (2008). In both parts of Germany, 48 per cent of women have chosen cohabitation as their first type of partnership. East and West Germany, however, differ in their proportions of women who have already entered into first marriage. While about 30 per cent of women in East Germany (see Figure 2.4) have chosen marriage as the first type of union by age 26, it is only about 20 per cent in West Germany (see Figure 2.5). This difference in the marriage pattern reflects the well-known younger marriage age of women in the GDR. East German women also enter more into a second marriage until age 26. West German women have a higher proportion of women who are still single at age 26 (30 per cent versus 21 per cent).

If we look at the advanced phase of the family formation process at age 35, the differences between East and West German women almost disappear (see Figure 2.6 and Figure 2.7). Otherwise said, East German women have a lead in the process of family formation at a younger age but as women are getting older, the sequence of the living arrangements is becoming surprisingly similar in East and West Germany at age 35.

2.2 The Proportion of Ever Married Women over the Life Course in East and West Germany

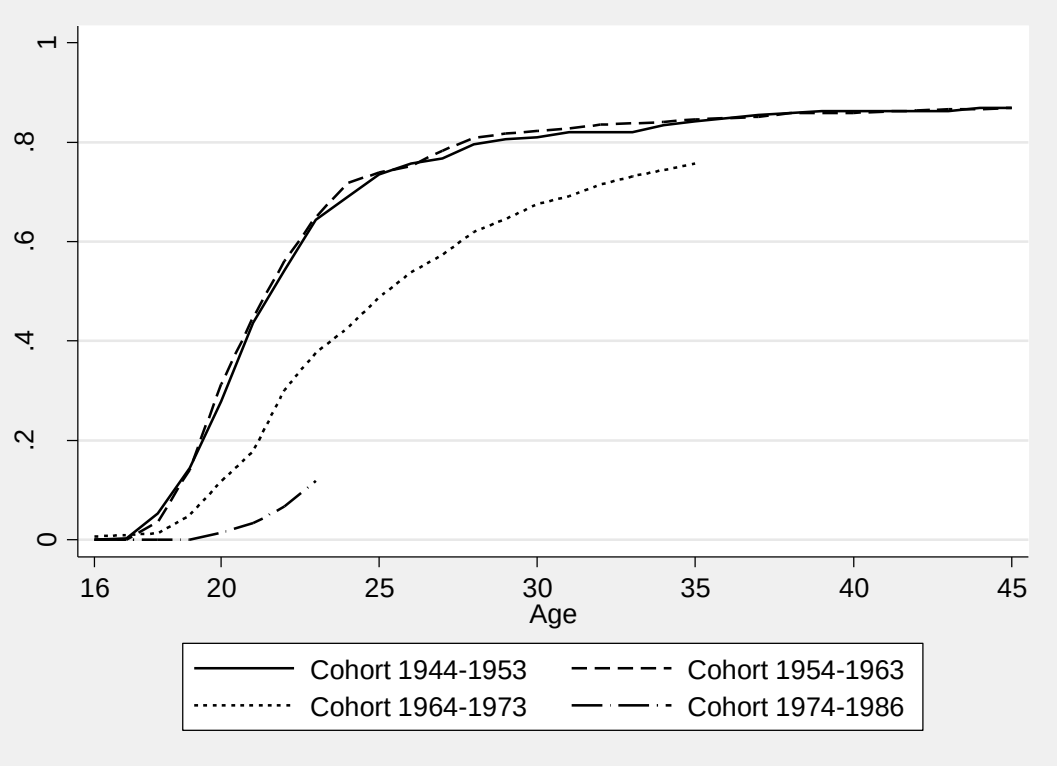
Figures 2.8 and 2.9 show the proportion of ever married women by age and birth cohort in East and West Germany. Figure 2.8 shows that West German women tend to delay their entry into first marriage over all successive birth cohorts. In contrast, the two oldest birth cohorts (1944-1953 and 1954- 1963) in East Germany (see Figure 2.9) do not differ in their marriage patterns with regard to the proportion of women ever married at any age.

Figure 2.8: Proportion of women ever married in West Germany, by birth cohort



Source: Estimations based on NEPS data from the adult study

Figure 2.9: Proportion of women ever married in East Germany, by birth cohort



Source: Estimations based on NEPS data from the adult study

These two birth cohorts of women have experienced the phase of family formation under the conditions of the GDR. In other words, there has only been an increasing delay of entry into marriage for the two youngest birth cohorts in East Germany after the German unification.

If we look at age 30, about 80 per cent of women born between 1944 and 1963 have ever entered into a first marriage in both East and West Germany. In contrast, only about 60 per cent of West German women and about 65 per cent of East German women born between 1964 and 1973 have ever entered into marriage by age 30. Finally, among the youngest birth cohort (birth cohort 1974-1986) a further decline in the proportion of ever married women can be observed in East and West Germany. For example, by age 23, only about 12 per cent of West German women and 15 per cent of East German women have ever been married. Put another way, Figures 2.8 and 2.9 show that both East and West German women postpone their entry into marriage over the life course. As a result, the proportion of ever married women declines at each age over successive birth cohorts.

2.3 Women's Partnership Status at First Birth and the Proportion of Childless Women

The first column in Table 2-1 shows the proportion of women in East and West Germany that remains childless up to a certain age in different birth cohorts. In addition, this table reports the proportion of women who have born a child in a specific partnership state. We distinguish three partnership states: (1) single (column two in Table 2-1), (2) cohabiting (column three in Table 2-1); and (3) married (column four in Table 2-1).

To analyse changes between the different birth cohorts and across the life course, we have divided Table 2-1 into three sections. The upper panel of Table 2-1 shows the distributions of women at age 26, the middle panel of Table 2-1 shows the distributions of

women at age 35, and the lower panel of Table 2-1 shows the distributions of women at age 45.

If we look at the upper panel of Table 2-1, it can be seen that only 30 per cent of East German women from the birth cohort 1944-1953 are still childless at age 26. This proportion has dropped to about 20 per cent for the birth cohort 1954-1963. After this drop, the proportion of women who have remained childless at age 26 increased again across the subsequent birth cohorts. About 68 per cent of East German women from the youngest birth cohort (1974-1983) have remained childless up to age 26. The proportion of childless women at age 26 has always been much higher in West Germany. Over the successive birth cohorts, it has monotonically increased from about 53 per cent in birth cohort 1944-1953 to about 85 per cent in birth cohort 1974-1983. This change reflects partly the increasing delay of entry into first motherhood over the life course.

With regard to the partnership status of women at first birth, considerable differences between East and West German women can be found. The proportion of single women who gave birth to a first child at age 26 has always been much higher in East than in West Germany. For the three older birth cohorts, it has been between 14 and 18 per cent in East Germany and between three and seven per cent in West Germany. The higher proportion of single mothers at the time of the GDR can be explained by the special support of non-married mothers in the socialist state (Gysi, 1989; Höhn et al., 1990). The youngest birth cohort (1974-1983) in East Germany, who experienced the family formation phase under the conditions of the united Germany, has a much lower proportion of single mothers (eight per cent). In both parts of Germany, the proportion of women who have already entered into motherhood at age 26 while being in a cohabiting union has increased over the successive birth cohorts and has always been on a much higher level in East Germany. This indicates that cohabitation in East Germany was supported in the GDR and that co-

habitation has been considered much more as an alternative to marriage than in West Germany. At the same time, the proportion of married women who have given birth to a first child at age 26 or younger has declined for both East and West German women and is now at about the same level for the youngest birth cohort (1974-1983) in both parts of Germany.

At age 35, we are only able to follow up women from the oldest three birth cohorts, since women from the birth cohort 1974-1983 are too young at the time of the retrospective interview. Table 2-1 shows that the majority of East and West German women have given birth to their first child within marriage. This proportion, however, is declining across cohorts in East and West Germany, but this trend is much stronger in East Germany. At the same time, the proportion of births out-of-wedlock has been rising in both parts of Germany. Compared to West Germany, the proportion of East German women at age 35 who have got their babies as single mothers (about 20 per cent) or within a cohabiting union (about 24 per cent) is particularly high. Again, this reflects the specific fertility policy in the GDR that supported births out-of-wedlock (Gysi, 1989; Höhn et al., 1990).

At age 45, we are only able to observe the two oldest birth cohorts. These are the cohorts who experienced the greatest part of their family formation phase either in the GDR or the former FRG. Again, the proportions of women who got their babies within marriage were not that different in the GDR and the former FRG. In both parts of Germany, the majority of women have given birth to a first child while being married, even though this proportion is somewhat lower in East Germany. East and West German women at age 45, however, differ strongly in their childlessness and in the proportion of single mothers: (1) the proportion of childless women in West Germany (about 19 per cent) is about twice as large than in East Germany (about ten per cent); and (2) the proportion of single

Table 2-1: Women's family status at first birth and the proportion of childless women for East and West Germany by birth cohort, up to a certain age

	No child	Partnership status of the woman at first birth			Total	
		single	cohabiting	married		
Age 26						
East Germany						
Cohort 1944-1953	30	14	4	52	100	(284)
Cohort 1954-1963	20	16	12	52	100	(383)
Cohort 1964-1973	45	18	14	23	100	(305)
Cohort 1974-1983	68	8	15	9	100	(210)
West Germany						
Cohort 1944-1953	53	7	2	38	100	(785)
Cohort 1954-1963	64	4	2	30	100	(1,468)
Cohort 1964-1973	78	3	3	16	100	(1,184)
Cohort 1974-1983	85	2	4	9	100	(720)
Age 35						
East Germany						
Cohort 1944-1953	15	17	4	64	100	(284)
Cohort 1954-1963	9	19	14	58	100	(383)
Cohort 1964-1973	14	21	24	41	100	(305)
West Germany						
Cohort 1944-1953	24	9	3	64	100	(785)
Cohort 1954-1963	22	7	5	66	100	(1,468)
Cohort 1964-1973	28	6	8	58	100	(1,184)
Age 45						
East Germany						
Cohort 1944-1953	13	18	4	65	100	(284)
Cohort 1954-1963	7	20	14	59	100	(383)
West Germany						
Cohort 1944-1953	20	9	4	67	100	(785)
Cohort 1954-1963	17	7	6	70	100	(1,468)

Source: Estimations based on NEPS data from the adult study

mothers in East Germany (19 per cent) is about twice as large as in West Germany (eight per cent).

2.4 Summary

The descriptive analysis of the NEPS data in this chapter showed that over the successive birth cohorts, women in East and West Germany tend to delay their entry into marriage, resulting in an overall lower proportion of ever married women. Furthermore, we have studied women's partnership histories. We were able to show that the proportion of women who remained single until the age of 35 is stable over the successive birth cohorts.

A different pattern appeared with regard to the proportion of women who enter into cohabitation or marriage as a first type of union. While the proportion of women who entered straightly into marriage has declined over the successive birth cohorts, cohabitation as first type of union gained in importance. In the youngest birth cohort, the vast majority of women (about 60 to 70 per cent) entered into cohabitation as a first union. Nevertheless, marriage still seems to be important to women in Germany since the majority of cohabiting women transformed their nonmarital unions into marriages. Hence, cohabitation is mostly an additional stage in the marriage process of women in Germany. The diagrams also indicated that East German women experience their transition into a first union at a younger age than their West German counterparts.

Finally, the majority of women gave birth to a first child in a marital setting in both East and West Germany. The proportion of women who have got their first child when they were single or cohabiting is generally much higher in East Germany compared to its West German counterpart. All in all, East German women start their family at a younger age than West German women.

2.5 References

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3 Entry into First Cohabitation or First Marriage: A Longitudinal Analysis

In the early 1960s, premarital cohabitation was still exceptional in most European countries (Blossfeld, 1995; Nazio, 2008; Manting, 1994). Children were generally born within marriages and the birth out-of-wedlock was considered as illegitimate. At that time, a nonmarital conception of a child often triggered the marriage before the child was born. Since then, the age at first marriage has been increasing in East and West Germany and the marriage rates have been declining (Nazio, 2008). Research attributes the rising age at marriage to the prolongation of educational enrolment in the life course and to increasing uncertainty in the labour market (Nazio, 2008; Blossfeld & Jaenichen, 1992; Blossfeld et al., 2006; Mills & Blossfeld, 2013). In addition, according to the human capital theory (Becker, 1981), better educated women might find marriage less benefitial and therefore marry less. Nevertheless, young men and women start to set up households with partners without being married (Nazio, 2008; Manting, 1994). Young people also see premarital cohabitation as an opportunity in the search and bargaining process (Oppenheimer, 1988). Women, in particular, can use cohabitation as an opportunity to explore a partner's willingness to share household and childrearing tasks before they enter into a more binding relationship such as marriage (Cherlin, 2000). Furthermore, researchers have argued that as a result of better education women have greater economic independence and an improved bargaining position in the partner search process. This allows them to search longer for an acceptable match and test their partners in nonmarital unions, which reduces the probability to end up in an unhappy marriage.

Previous research on Germany mainly studied women's changing relationships between education and entry into marriage (Strohmeier, 1993; Wagner & Franzmann, 2000). There have only been very few attempts to analyse the dynamics of family formation processes with regard to competing forms of living arrangements such as first co-

habitation and first marriage using longitudinal data in Germany (Brüderl, 2004; Nazio, 2008) (timing of events and transitions, see Chapter 1.3). What is also rare is a comparative analysis of these relationships in East and West Germany (Konietzka & Kreyenfeld, 2007; Nazio, 2008) (principle of place and time, see Chapter 1.3).

In this chapter, we study the processes of single women's entry into first union using longitudinal data from the NEPS. We focus on East and West German women's entry into cohabitation versus entry into marriage as two competing events. We proceed in three steps: Firstly, based on available studies, we formulate testable hypotheses with regard to entry into first cohabitation or first marriage for women in East and West Germany. Secondly, we define the variables used in our event history analysis. Thirdly, we present and discuss the empirical results of our comparative longitudinal analysis. The chapter concludes with a summary of the empirical evidences.

3.1 Theoretical Framework and Hypotheses

We focus our theoretical discussion on the union formation process during educational expansion and the different historical contexts in East and West Germany before and after German unification.

3.1.1 Union Formation Processes and Educational Expansion

In the course of educational expansion, men's and women's educational enrolment over the life course has extended and union formation processes of young adults have changed. Entry into first union, such as cohabitation or marriage, has been shown to be highly dependent on the educational enrolment of an individual (Blossfeld & Huinink, 1989; Hoem, 1986; Liefbroer, 1991; Mills, 2000) (life span development, see Chapter 1.3). Marriage is a long-term binding and legal institution, in which interpersonal relationships between spouses are acknowledged by the state and where strong commitments of the spouses are required. In Germany, cohabitation is still a less binding living ar-

rangement where two individuals live together in a nonmarital union on a more or less permanent basis with less legal rights but with similar benefits of married life such as pooling of resources and economies of scale (Oppenheimer, 1994).

In the demographic literature, two different views about the impact of educational enrolment on union formation can be found. According to the first view, students are generally less likely to enter into a first union during educational enrolment, since students are economically dependent on the state and their parents and have fewer material resources (Rindfuss & Vandenheuvel, 1990). Moreover, as students are more uncertain about their future life-courses they might be less willing to make long-term binding decisions such as marriage (Hoem, 1986). Hogan (1978) stresses that also a normative sequence of finishing education, entering the job market and entry into a union typically exists due to general societal norms about these events, issues of economic independence and time conflicts between different roles. As a result of these factors, individuals move from schooling to work and then to cohabitation or marriage as well as parenthood. Therefore, young adults will be less likely to enter into a union before they have finished schooling since they might consider themselves as not ready for union formation. Hence, our first hypothesis is that female students will have a much lower rate of entry into any type of first union – being it first cohabitation or first marriage.

The second view also acknowledges that the economic dependence of being a student is hardly compatible with the adult role of a marital partner (Thornton, Axinn & Teachman, 1995) (timing of events and transitions, see Chapter 1.3). However, it posits that "cohabitation [can get] young people out of high-cost search activities during a period of social immaturity" (Oppenheimer, 1994: 308). It is also argued that cohabitation is less costly than marriage (Liefbroer, 1991) and fewer practical requirements and normative expectations are attached to nonmarital unions (Liefbroer, 1991). Thus, young adults, who

are enrolled in education, might still set up households with partners and enter into cohabitation but less into marriage. Therefore, our second hypothesis can be formulated as follows: If single women are enrolled in education, they are less likely to enter into a union at all, but if they do, they are much more likely to start a cohabitation than a marriage.

Blossfeld and Hunink (1989) were able to show that women's entry into marriage is dependent on women's educational participation but not on women's highest educational attainment level. Nevertheless, women's educational attainment level might have an influence on the transition into cohabitation. Oppenheimer (1988) argues that better educated women are economically more independent than less qualified women and can enter more easily into a less binding union such as cohabitation. Thus, according to our third hypothesis, we expect that better educated women will enter more often into a nonmarital union than their less educated counterparts.

3.1.2 Union Formation and the Two Germanies Before and After German Unification

During the German division from 1949 to 1990, the GDR and the FRG differed markedly in their political and family support systems (principle of time and place, see Chapter 1.3). Until today, marriage has been an important institution in West Germany and is supported by a tax system that promotes the "male breadwinner" and the "male breadwinner and female secondary earner" models of marriage (Esping-Andersen, 1999; Gauthier, 1996; Gornick, Meyers & Ross, 1998; Holst & Schupp 2001; Treas & Widmer, 2000). Over several decades, the poorly developed childcare provision by the state supported the continuity of the male breadwinner model and reinforced women's dependent roles as housewife and mother in West Germany (Veil, 2005). As a result, marriage has been the dominant living arrangement in West Germany. In this part of Germany, cohabitation was mostly restricted to young adulthood, steeply decreasing after age 30 and being rather a prelude than a permanent alternative to marriage (Klein et al., 2002). Nevertheless, as

shown in the introduction, the cumulative proportion of women who have ever lived in a nonmarital union before first marriage has been rising for decades in West Germany (see Figure 1.4), while there has been a decline in first marriage rates without previous cohabitation at the same time (see Figure 2.8). The descriptive analysis in Chapter Two has shown that there has also been a strong decline in marriage rates without previous cohabitation in East Germany and an increase in cohabitation before first marriage. According to Nazio (2008), the process of diffusion of cohabitation before entry into first marriage has been very similar in East and West Germany, since the spread of cohabitation "seems to be mainly driven bei the direct social modelling of the peers" (Nazio, 2008) rather than by a strong mechanism that that links cohabitation experiences across cohorts. We therefore expect in our fourth hypothesis, that over successive decades women in East and West Germany do enter increasingly more into cohabitation as first type of union and less often into marriage (period effect). Beyond that, we do not expect a statistically significant effect for being born in East or West Germany (fifth hypothesis) and no statistically significant interaction effects for the different historical periods with East Germany (sixth hypothesis).

However, in West Germany, a pregnancy still constitutes one of the main reasons to enter into a marriage before the first child is born, so that the majority of children are born within a marriage (Nave-Herz, 2004; Simm, 1991; Tölke, 1993; Vaskovics & Rupp 1995; Lauterbach, 1999: 303-304). In other words, marriage and entry into parenthood are still closely interlinked in West Germany. Therefore, we expect in our seventh hypothesis that single West German women have a high rate of entry into first marriage when they are expecting their first child.

In contrast to West Germany, until 1986, the GDR offered unmarried mothers generous financial and institutional support (Gysi, 1989; Höhn et al., 1990). For example, the

GDR provided extensive support for unwed mothers in terms of privileged housing access, free childcare as well as financial benefits (Huinink & Wagner, 1995; Trappe, 1996). After 1986, the GDR abolished the financial and institutional support for unmarried mothers. Surprisingly, the rate of cohabitation did not change afterwards (Nave-Herz, 2004). Therefore, we expect in our eighth hypothesis that East German women are less likely to enter into marriage when they expect a first child than their West German counterpart.

During the process of German unification, East Germany adopted not only the West German law and its currency, but also the whole political and institutional structures. After the German unification, people in the former GDR were facing high rates of insecurity with regard to their future life courses due to high unemployment rates and structural and institutional changes on the labour market. It is well known that uncertainty, such as labour market insecurity may cause a delay of entry into marriage and individuals may prefer forming more flexible partnerships instead of marriage (Mills, 2005). Thus, we expect in our ninth hypothesis a significant decline in marriage rates in East Germany and no change in the rate of first cohabitation immediately after the German unification. We also include the structural unemployment rate in East and West Germany as a measure of macro structural insecurity.

3.1.3 Further Important Factors Influencing First Union Formation

Age Dependency. It is well known that the rate of entry into first union has a non-monotonic age pattern in modern societies (e.g. Bloom 1982; Coale 1971). As women's age increases, the rate of entry into first union initially rises, reaches a peak, and then decreases. This is true for both cohabitation and marriage. This bell-shaped base-line hazard rate can be explained by an interplay of two mechanisms: (1) the increasing readiness to enter into a union when young individuals are getting older; and (2) the declining proba-

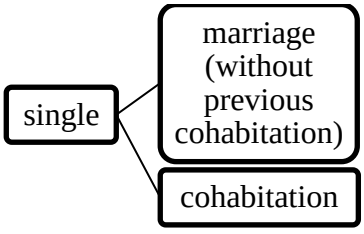
bility to meet a single partner in a specific age range on the partner market with rising age. For example, younger people are getting more ready to enter into a union as they are getting older. At a younger age, plenty of singles are available on the partner market in the relevant age range. Thus, in a first phase, the probability that individuals enter into a union is increasing. As more and more young men and women enter into unions with increasing age, it becomes, however, more difficult to meet a single within the relevant age band. Thus, the probability to form a union is levelling off with further increasing age, reaching a peak and then decreasing. Given the importance of this pattern over the life course for entry into a first union, it seems reasonable to include age dependency into our longitudinal models as a control variable.

Cohort trend. Due to the general diffusion of cohabitation as a first union in East and West Germany across cohorts, cohabitation has got less and less stigmatized and increasingly fashionable across cohorts (Nazio, 2008). Therefore, we expect that the rate of entry into first cohabitation is increasing and, at the same time, entry into first marriage is declining across cohorts. We include a cohort trend variable into our equations of entry into first cohabitation and entry into first marriage in order to control for this development.

3.2 Definition of Variables

Dependent variables. We estimate competing risk event history models (see Section 1.5: 53 pp) for single women's entry into first union using NEPS data (see Section 1.4: 41

Figure 3.1: Competing risks for the transition into a first union



Source: Own diagram

pp) and distinguish first cohabitation and first marriage (without previous cohabitation) (see Figure 3.1).

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

(1) *Age dependency (time-dependent covariate).* To model the non-monotonic shape of entry into first union across age, we include two variables, 'Log (current age-15.9)' and 'Log (67.1-current age)', which allow us to flexibly test different base-line age shapes.

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

(3) *Macro structural insecurity (time-dependent covariate).* To control for the influence of unemployment on entry into first union, we include the time-varying macro variable 'Unemployment rate' measured separately for East and West Germany (see Figure 1.7 on page 43). We attach the annually changing unemployment rate to each month of the year.

(4) *Historical periods (time-dependent covariates).* To distinguish historical periods in our analysis, we include dummy variables distinguishing five historical periods: '1960-1969 (ref.)', '1970-1979', '1980-1989', '1990-1999' and '2000-2010'. Additionally, we include the following interaction dummy variables 'East*1970-1979', 'East*1980-1989', 'East*1990-1999' and 'East*2000-2010' to estimate possible differences between East and West German women.

(5) *Linear cohort trend (time-constant covariate).* To control for structural changes in the diffusion of cohabitation versus marriage, we include a variable that has

the value ‘1’ for birth cohort 1944-1953, ‘2’ for birth cohort 1954-1963, ‘3’ for birth cohort 1964-1973 and ‘4’ for birth cohort 1974-1986.

(6) *Women’s educational enrolment (time-dependent covariate).* We include a time-dependent dummy variable to indicate whether a woman is enrolled in education.

(7) Woman’s educational attainment level (time-varying covariate). 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 university of applied sciences is equivalent to 17 years; and a university degree is equivalent to 19 years.

(8) *Children (time-dependent covariate).* To indicate, whether a single woman has no child, is pregnant, has a first child or has at least two children, we introduce the following dummy variables into our analyses: ‘No child (ref.)’, ‘First pregnancy’, ‘First child’, ‘Second pregnancy,’ and ‘At least two children’. The beginning of the first and second pregnancy was reconstructed on the information of the timing of the first and second births. Furthermore, we include the following interaction dummy variables with the place of birth ‘East*First pregnancy’, ‘East*First child’, ‘East*Second pregnancy,’ and ‘East*At least two children’ to estimate the differences between East and West German women.

3.3 Results

Using discrete-time event history models with time-constant and time-varying covariates (see Section 1.5: 47pp), we study single women's entry into first union in Germany as competing events. We follow up single women from age 16 until they enter into first cohabitation or first marriage (without previous cohabitation). Single women are right censored when they have not had a first (marital or nonmarital) union until the time of the retrospective interview.

Table 3-1 shows the estimates for women's entry into first cohabitation and first marriage as competing risks. In order to test, whether there is a non-monotonic age dependency of both entries over the life course, we include in each of the models in Table 3-1 two dummy-variables: 'Log (current age-15.9)' and 'Log (67.1- current age)'. In both models, the coefficients of these two variables are positive and significant, which indicate that the entry rates are indeed initially increasing, reaching a peak and then decreasing with rising age. Since in both models the coefficient for 'Log (67.1-current age)' is greater than the coefficient for 'Log (current age -15.9)', the bell-shaped curves of entry into first cohabitation and entry into first marriage are right-skewed.

In order to study the diffusion of cohabitation as a first union across cohorts, we include a linear cohort trend in our two models of Table 3-1. While the estimate for single women's entry into first cohabitation is positive and significant, it is negative and significant for single women's entry into first marriage. Hence, the rate of women's entry into first cohabitation is increasing and women's entry into first marriage is declining across cohorts in East and West Germany. Generally, this supports our expectations and shows that cohabitation has got less and less stigmatized and has become more widespread and fashionable across cohorts (hypothesis four).

In order to test whether there are differences between East and West Germany with regard to single women's entry into first cohabitation and first marriage, we include a dummy variable for place of birth, the unemployment rate and dummy variables for the various historical periods as well as their interaction dummy variables with East Germany into our models. As expected, the coefficients of the dummy variables for the historical periods are

Table 3-1: Estimates of the rate of entry into first cohabitation or first marriage

Variables	**Entry into first…**	
	Cohabitation	**Marriage**
Age dependency (time-dependent covariates)		
Log (age-15.9)	1.055***	1.600***
Log (67.1-age)	5.038***	7.472***
Cohort trend		
Linear cohort trend	0.141**	-0.168*
Place of birth (time-dependent covariate)		
West Germany (ref.)		
East Germany	0.159	-0.023
Macro structural insecurity (time-dependent covariate)		
Unemployment rate	-0.015	-0.090***
Historical Periods (time-dependent covariates)		
1960-1969 (ref.)		
1970-1979	1.063***	-0.062
1980-1989	1.170***	-0.376*
1990-1999	1.132***	-0.619**
2000-2010	1.011***	-0.844**
East*1970-1979	-0.198	-0.113
East*1980-1989	-0.459	-0.228
East*1990-1999	0.161	-0.578
East*2000-2010	0.131	0.664
Children (time-dependent covariates)		
No child (ref.)		
First pregnancy	1.506***	2.962***
First child	-0.401**	-0.392*
Second pregnancy	0.578*	0.119
At least two children	-1.046***	-1.517***
East*First pregnancy	-0.160	-0.465***
East*First child	0.432*	0.669**
East*Second pregnancy	-1.520*	-0.400
East*At least two children	0.051	0.554
Education (time-dependent covariates)		
Enrolled in education	-0.591***	-0.825***
Not enrolled in education (ref.)		
Woman's educational attainment level (years)	0.043***	-0.016
Intercept	-27.529***	-35.343***
Number of events	3240	1789
Number of sub-episodes	571,328	571,328
Chi^2	2091.85	3311.52
Degrees of freedom	22	22

Note: *p<.05; *p<.01; ***p<.001; N=5,340; Source: Estimations based on NEPS data from the adult study

significantly positive for women's entry into first cohabitation and significantly negative for women's entry into first marriage (hypothesis four). These coefficients reflect the rising proportion of women who enter into cohabitation and the declining proportion of women who enter into marriage as a first union across decades. The insignificant dummy variable for East Germany and the insignificant interaction terms between the historical periods and East Germany confirm Nazio's (2008) findings that the process of diffusion of cohabitation has been very similar in East and West Germany (hypotheses five and six). The same is true for the decline in single women's entry into first marriage. With regard to the effect of the unemployment rate, we can see a clear difference between cohabitation and marriage. While the unemployment rate has no significant effect on women's entry into first cohabitation, it has a negative and significant effect on women's entry into first marriage. In other words, women delay and marry less often if the unemployment rate is high while entry into cohabitation is not affected by economic insecurity. This suggests that women in East and West Germany hesitate to make long-term binding decisions in times of increasing uncertainty (see Mills 2008). Compared to marriage, cohabitation is a more flexible and less binding arrangement and is therefore obviously less affected by economic uncertainty.

It is well known from the literature that fertility and union formation processes are closely connected in Germany (Blossfeld & Huinink, 1989; Kreyenfeld, 2005). Therefore, we have included time-dependent dummy variables indicating whether a single woman is pregnant, has given birth to a first child, is pregnant with a second child and has given birth to at least two children as well as the interaction terms of these dummy variables with East Germany into our models in Table 3-1. The positive and significant coefficients of the variable 'First pregnancy' show that a first pregnancy is a driving force for a single woman to enter into both first cohabitation and first marriage. Though, as expected, this effect is much stronger on entry into marriage than on entry into cohabitation. The negative interaction effect of first pregnancy with East Germany indicates that the influence of a first

pregnancy on single women's entry into first marriage is much stronger for West German women (hypotheses seven and eight). This supports Vaskovics' and Rupp's (1995) finding that the birth of a child still constitutes one of the main reasons to enter into a marriage in West Germany. If the first child was already born, the opportunity to enter into a first union is strongly reduced for single women as is indicated by the negative and significant coefficient of the dummy variable for a first child and supports the results of Blossfeld and Mills (2001). It is important to note, that the rate of entry into first cohabitation and first marriage for single women, when a first child was born, is higher in East than in West Germany, since the coefficients for the interaction term of 'East Germany*First child' are positive and significant. The positive coefficient of the dummy variable 'Second pregnancy' and the negative coefficient for the interaction term 'East Germany*Second pregnancy' show that West German single women are more likely to enter into a cohabitation when they are pregnant with a second child. The negative coefficients of the dummy variable 'At least two children' on entry into first cohabitation and entry into first marriage show that single women with two or more children have an exceptionally low probability to enter into a first union. For these women, there is no significant difference between East and West Germany.

Finally, in order to study the effect of educational expansion on women's entry into first cohabitation versus first marriage, we have included two time-dependent covariates in our models (see Table 3-1): (1) being enroled in education and (2) woman's educational attainment level. Both estimates show that single women are less likely to enter into a union when they are enrolled in education – being it first cohabitation or first marriage (support for hypothesis one). Thus, as predicted, the status of an economically dependent student reduces the readiness to enter into a first union. Nevertheless, our estimates show that the negative effect of being enrolled in education is much stronger for entry into first marriage than for entry into first cohabitation. This is in line with our expectations that

those women, who are enrolled in education and enter into a first union, are more likely to start a cohabitation than a marriage since fewer normative expectations are attached to cohabitation (hypothesis two). Women's educational attainment level, on the other hand, does not have an effect on women's entry into first marriage but has a positive and significant effect on women's entry into cohabitation. This result supports the findings of Blossfeld and Hunink (1989), who showed that women's entry into marriage is not dependent on women's highest educational attainment level. This evidence also contradicts the hypothesis of the economic theory of the family that better educated women are less likely to marry (Becker, 1981). However, our finding is in line with Oppenheimer's (1988) prediction that better educated women are economically more independent than less qualified women which allows them to enter into a less binding union such as cohabitation.

3.4 Summary of Empirical Findings

This chapter has focused on single women's entry into first cohabitation and first marriage in East and West Germany. Utilizing retrospective longitudinal data from the National Educational Panel Study (NEPS), we estimated a competing risk event history model to study the impact of place and historical periods, macro-structural insecurity, education and the birth of children on single women's union formation processes. Our results show that the transition into a first union has a bell-shaped pattern across age that initially rises, reaches a peak, and then decreases. There is not only a general cohort trend in East and West Germany in which cohabitation has become increasingly widespread as a first form of living arrangement but also an increase across historical periods since the 1960s (hypothesis five and six).

When single women are expecting a child, the marriage rate is higher than the rate of cohabitation in both East and West Germany. East and West German women, however,

differ with regard to the process of union formation. While West German single women experience a strong increase of the rate of entry into marriage when they are getting pregnant, this is much less the case for East German women (hypothesis seven and eight). Thus, West German women still want to give birth to their first child within a marital setting. This is much less important in East Germany and suggests that East Germans see cohabitation much more often as an alternative to marriage. The rate of marriage and cohabitation decreases even further when women have born their second child. Macrostructural insecurity, in terms of high unemployment rates, has a delaying effect on women's entry into marriage. This suggests that single women are less willing to make long-term binding decisions such as marriage in times of economic uncertainty. In comparison, cohabitation, which is a more flexible and less binding living arrangement, seems to be less affected by an economic crisis.

The results of our analysis demonstrated that women's education has different effects on single women's union formation. Educational enrolment itself leads to a postponement of single women's entry into a first union – being it cohabitation or marriage. However, if women start a union while enrolled in education they enter more often into cohabitation than a marriage. A woman's educational attainment level has no effect on entry into first marriage but it increases the rate of entry into cohabitation. It seems that highly educated women have a greater economic independence and higher autonomy which allows them to enter more into flexible living arrangements such as cohabitation.

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4 The Transition from Cohabitation to Marriage: Does the Meaning of Cohabitation Differ in East and West Germany?

In the previous two chapters, we have shown that in East and West Germany young single women increasingly started to set up households with partners without being married over the last four decades. In this chapter, we analyse to which extend these cohabitations are transformed into marriages in the later life course (timing of events and transitions, see Chapter 1.3). In the literature, two different meanings of cohabitation are usually distinguished (Manting, 1994; Mills, 2000; Kiernan, 2000; Wu, 2000): (1) cohabitation as a trial arrangement or a stage in the marriage process, and (2) cohabitation as a more or less permanent alternative to marriage. "Cohabitation interpreted as a temporary phase before marriage is seen as a major reason for the delay, but not for an overall decline of marriage" (Manting, 1994: 25). Thus, marriage might not necessarily become irrelevant in the family formation process, but is instead only postponed in the life course (Liefbroer & Billari, 2009). If cohabitation is a temporary phase preceding marriage, it typically has short durations and is often transformed into a marriage if children are expected (Sassler & Cunningham, 2008). Put in a different way, the intention to have children remains a prominent reason to move from cohabitation to marriage (Moors & Bernhardt, 2009). If individuals view cohabitation as a permanent alternative to marriage, then women often have their babies within a long-term nonmarital setting and cohabitation is a major factor for the decline of marriage as an institution (Bumpass, 1990).

It seems that during the German division, cohabitation has become a different meaning in both parts of Germany (Perelli-Harris et al., 2010; Nave-Herz, 1994) (principle of place and time, see Chapter 1.3). In the FRG, cohabitation has always merely been a stage in the marriage process until children are expected, so that the great majority of children has been born within a marriage (Nave-Herz, 2004; Simm, 1991; Tölke, 1993; Vaskovics & Rupp 1995). As a result, West Germany is characterized by a high proportion of couples

who decide to enter into a marriage during pregnancy (Blossfeld & Mills, 2002). In contrast, the GDR offered generous financial and institutional support to single and cohabiting mothers, so that more and more young couples decided to opt for cohabitation rather than marriage (Gysi, 1989; Höhn et al., 1990). As a result, parenting depended less on marriage in the former GDR. Thus, the question arises to which extend the structure of cohabitation has become different in East and West Germany before and after German unification. In Chapter Two, we have shown that East German women started with family formation earlier in the life course than West German women but the sequence of living arrangements has been very similar in both parts of Germany. In this chapter, we analyse the differences in the duration of cohabitation and study the effects of various life course constellations on the transition from cohabitation to marriage in East and West Germany. In the following, we discuss theoretical approaches and formulate testable hypotheses with regard to the transition from cohabitation to marriage and the dissolution of a first cohabitation. Then, we describe the variables used in the analysis. Finally, we present and discuss the empirical findings of the longitudinal analysis. The chapter concludes with a summary of the results.

4.1 Theoretical Framework and Hypotheses

4.1.1 The Meaning of Cohabitation

As noted in the introduction of this chapter, two meanings of cohabitation are discussed in the literature (Manting, 1994; Mills, 2000; Kiernan, 2000; Wu, 2000): (1) cohabitation as a temporary phase before marriage and (2) cohabitation as a more or less permanent alternative to marriage. According to the first meaning, marriage remains a highly accepted institution in a modern society (Moors & Bernhardt, 2009). Nevertheless, marriage is increasingly more often preceeded by a period of cohabitation (Liefbroer & Billari, 2010). In this case, there are two basic motivations for cohabitation: (1) cohabita-

tion may be used as a trial marriage by couples who are uncertain about their relationship; and (2) cohabitation may be chosen as a flexible living arrangement in life course phases that are characterized by uncertainty. Cohabitation as a trial marriage is often a response to the uncertainty whether a partner is indeed a suitable potential spouse (Bumpass & Sweet, 1989; Clarkberg, Stolzenberg & Waite, 1995; Klijzing, 1992; Seltzer, 2004). If the trial is being experienced as successful, the couple will marry, if not, it will break up. This 'weeding-out' process assumes that mainly suitable partner matches are transformed into marriages (Hoem & Hoem, 1988).

The choice to cohabit with a partner can also be motivated by specific life course situations. For example, the prolongation of educational enrolment in the life course, that results in an extended phase of financial dependence and a delayed entry into the labour market, is expected to strongly influence the timing of transition from cohabitation to marriage (Bernhardt & Hoem, 1985; Blossfeld & Huinink, 1991; Hoem, 1986; Kravdal, 1999; Oppenheimer, 1988).

> Cohabitation gets young people out of high-cost search activities during a period of social immaturity but without incurring what are for many, the penalties of either heterosexual isolation or promiscuity, and it often offers many of the benefits of marriage, including the pooling of resources and the economies of scale that living together provide… However, cohabitation also provides some of the advantages of remaining single. While it may currently tie people up (though not as much as a marriage), its influence on future mating behavior is much less, and the long-run financial obligations are also relatively low. (Oppenheimer, 1988: 583-584)

Expressed differently, young adults may opt for cohabitation rather than marriage in specific life course situations such as being enrolled in education, although they aspire to get married one day (Baizán & Martín-García, 2006; Gibson-Davis, 2009; Gibson-Davis, Edin & McLanahan, 2005; Kalmijn, 2011; Kravdal, 1999; Manning & Smock, 2002). Therefore, we expect in our first hypothesis that women who are enrolled in education will have a lower likelihood to turn their cohabitations into marriages than women who are not participating in education. Since women enrolled in education are in a much more

immature social status, we also expect them to have a higher dissolution rate than women who have already left the educational system (second hypothesis).

In the previous chapter, we found support that better educated women have a higher rate of entry into cohabitation than less qualified women because they are economically more independent and can therefore more easily enter into less binding relationships such as cohabitation. If we assume that these higher educated cohabiting women make much more well-informed partner decisions, we expect them to have a higher rate of entry into marriage (third hypothesis) and a lower dissolution rate (fourth hypothesis).

In societies with strong gender-specific divisions of work at home, such as East and West Germany, men are usually expected to be male breadwinners or co-breadwinners and to strongly determine the economic position of the family (Cherlin 2000; Edin 2000; Edin & Kefalas 2005; Gibson-Davis et al. 2005; Smock et al. 2005). Particularly in marriages, the relative economic position of the partners within couples is still very important (Blossfeld &Timm, 1997; Casper &Bianchi, 2002). Since partners' educational attainment level can be used as a proxy for their income potential, we can distinguish three constellations of partners' educational matches in cohabitations: (1) women with a lower educational attainment level than their partner; (2) partners with the same educational attainment level, and (3) women with a higher educational attainment level than their partner. The most common educational matches among spouses in Germany are the ones where the wife has a lower or the same educational attainment level than her husband (Blossfeld &Timm, 1997). Marriages, where the woman has a higher educational attainment level than her partner are still rare and exceptional. There are two possible predictions for the transition from cohabitation to marriage and for the dissolution of consensual unions, if women have a higher educational attainment level than their partner. The first prediction is that women who cohabit with a less educated partner are generally less tradi-

tional, so that they have a lower transition rate from cohabitation to marriage and a lower dissolution rate of cohabitation, because they consider cohabitation as a permanent alternative to marriage (fifth hypothesis). The second prediction is based in the idea that women who cohabit with a less educated partner are much more socially accountable and more often risk negative judgements from friends, relatives and colleagues (West & Zimmermann, 1987; Fenstermacher et al., 1991). In this case, we expect that these cohabiting unions are less likely to be turned into marriages and are increasingly more often dissolved due to the higher social pressure on these couples (sixth hypothesis). It is an empirical question, whether there are differences of the educational matches in cohabitations on entry into marriage and dissolution in East and West Germany. We will include an interaction effect in our longitudinal analysis to test whether there are differences.

4.1.2 The Different Dimensions of Time in the Analysis of Cohabitation

In the analysis of the transition from cohabitation to marriage and the dissolution of cohabitation, we can distinguish: (1) the age at entry into first cohabitation (life span development, see Chapter 1.3); (2) the duration of cohabitation (principle of linked lives, see Chapter 1.3), and (3) the historical context (principle of place and time, see Chapter 1.3). Since we focus our analysis on the differences in the meaning of cohabitation in East and West Germany before and after the fall of the Wall, we discuss the historical context in the next section of this chapter.

Many empirical studies have linked union instability to an early age at union formation (e.g. Böttcher, 2006; Diekman & Engelhardt 1995; Dyer, 1986; Glick & Norton, 1977; Klein, 1999; South & Spitze, 1986; Wagner, 1997). According to Becker et al. (1977) and Oppenheimer (1988), couples who enter at a young age into a union are less likely to enter into marriage and more likely to experience a separation than couples who entered into a union at a higher age. If partners enter into cohabitation at a young age, they have nor-

mally spent not much time on searching for an appropriate partner and collected less information about a particular partner. This lack of information reduces the rate of entry into marriage for women who started to cohabit at a young age (seventh hypothesis) and increases their likelihood to experience the dissolution of their first cohabitation (eighth hypothesis).

The duration of cohabitation is also an important information when we analyse the dissolution of a cohabiting couple or the transition to marriage. Bennett, Blanc and Bloom (1988) argue that longer periods of cohabitation make the transition to marriage increasingly harder because couples develop costums and habits and are already used to enjoy the pooling of resources and the economies of scale that living together provides. We therefore expect in our ninth hypothesis that this behaviour creates an increasing inertia and leads to a monotonically decling rate of entry into marriage with increasing duration of cohabitation.

With regard to the separation of a cohabiting union, we expect the dissolution rate to be a result of an interplay of two contradicting forces: the initially increasing tendency to resolve mismatches among the partners and the rise of cohabitation-specific investments. To put it differently, we expect the rate of dissolution of a first cohabitation to reveal a bell-shaped pattern that initially rises, reaches a peak and then decreases with duration of cohabitation (tenth hypothesis).

4.1.3 The Two Germanies Before and After German Unification

As noted above, marriage has always been an important institution in West Germany and is still supported by a tax system that promotes the "male breadwinner" or the "male breadwinner and female secondary earner" marriage (Esping-Andersen, 1999; Gauthier, 1996; Gornick, Meyers & Ross, 1998; Holst & Schupp 2001; Treas & Widmer, 2000). Nevertheless, cohabitation as a first type of union has been on the rise in West Germany

since the 1960s. A longitudinal study by Vaskovics and Rupp (1995) analysed about 900 cohabiting couples in West Germany and showed that only a small minority of these couples viewed cohabitation as a long-term alternative to marriage. Most of these couples consider cohabitation as a temporary phase in the marriage process. Nine out of ten couples got married and the couples who separated were mostly childless (Vaskovics and Rupp, 1995: 185). Heuveline and Timberlake (2004) obtained the same results and show that cohabitation in West Germany is only a stage in the marriage process. According to Villeneuve-Gokalp (1991), cohabitation in West Germany is a kind of 'trial marriage' in which a partnership is tested before people decide to get married. Even though the rates in cohabitation have been constantly rising in West Germany, a pregnancy still constitutes one of the main reasons to transform the cohabitation into a marriage (Andersson, 2002; Lauterbach, 1999: 303-304; Musick, 2007). This pattern of 'child–centered marriages' did not much change across cohorts in West Germany (Kreyenfeld & Konietzka, 2005).

In the former GDR, unmarried mothers profited from privileged housing access, free childcare as well as financial benefits by the state (Gysi, 1989; Höhn et al., 1990; Huinink & Wagner, 1995; Trappe, 1996). This financial and institutional support reduced the incentive for cohabiting couples to turn their cohabitation into a marriage when they were expecting their first child. Nevertheless, according to Gysi (1989), cohabitation in the GDR did not have the meaning of an alternative to marriage. In fact, it was also perceived as a stage in the marriage process. In other words, cohabitations in the GDR, like in West Germany, were dissolved or were transformed into marriages but never really had the meaning of a permanent alternative to marriage.

We therefore predict in our eleventh hypothesis that East German women enter less often into a marriage during the period of German division than West German women, because East German women had fewer incentives to turn their cohabitations into marriag-

es. Furthermore, we expect that West German women do enter more often into marriage when they are expecting their first child (twelfth hypothesis), while East German women are more likely to enter into a marriage when the first child was already born (thirteenth hypothesis).

After the German unification, people in the former GDR were suddenly facing high rates of insecurity with regard to their future life courses due to steeply rising unemployment and fundamental changes in organisations and institutions (Diewald et al., 2006). This massive increase in economic and societal uncertainty in the early phase of the transition from the socialist to the capitalist system, leads cohabiting couples to remain in their more flexible partnerships (Mills, 2005). Previous research has shown that the former GDR has been facing a decline in marriage rates immediately after the German unification (Diewald et al., 2006). However, in our analysis, we only look at cohabiting couples. We therefore expect in our fourteenth hypothesis that East German cohabiting women are less likely to enter into marriage in the early phase after unification. If the economic uncertainty is decreasing in the later phase of the transition process and cohabitation is still a step in the marriage process in East Germany, then we expect that East German women will catch-up with their contemporaries in the marriage process, so that the transition rate from cohabitation to marriage is increased (fifteenth hypothesis).

4.1.4 The Long-Term Change in Social Norms

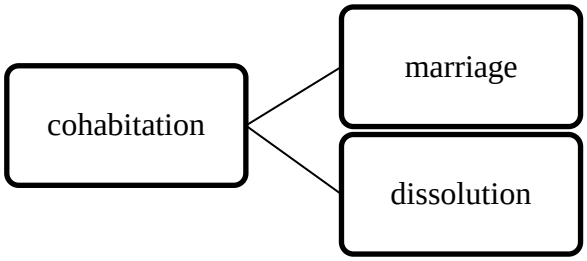
Individuals are born into societies that regulate the behaviour of their members through social norms (Lesthaeghe, 1980; Ryder, 1980). Norms can be defined as a set of rules that (1) prescribe and proscribe behaviour in a given situation (Freedman, 1963), (2) are supported by a widespread consensus, and (3) are enforced through various mechanisms of social control (Hägestad, 1990; Settersten, 1992; Settersten & Hägestad, 1996). Norms within modern societies do not remain unchanged. However, they usually change very

slowly and over a long period of time. In this process, old norms are being replaced by new norms that encourage members of a society to break traditional behaviour patterns step by step (van de Kaa, 1987). For example, in the course of educational expansion, increasingly more young adults might opt for cohabitation rather than marriage as first type of union since they are not yet ready to make long-term binding decisions such as marriage. If more and more individuals select themselves into cohabitation rather than marriage as a first type of union, cohabitation will get increasingly more accepted within society. As a result, the normative pressure to turn the cohabiting union into a marriage declines over time (across birth cohorts and historical periods) and cohabiting unions become more accepted. Hence, we expect that women stay increasingly longer in cohabitation before marriage across successive birth cohorts and historical periods (sixteenth hypothesis).

4.2 Definition of Variables

Dependent variables. Using NEPS data (see Section 1.4: 41 pp) and distinguishing first marriage and dissolution as competing risks, we study to which extent the meaning of cohabitation has become different in East and West Germany before and after German unification (see Figure 4.1).

Figure 4.1: Competing risks of separation or transition into a marriage from a first cohabitation



Source: Own diagram

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

(1) *Duration of cohabitation (time-dependent covariate).* We include dummy variables distinguishing nine periods of cohabitation duration: 'Up to 1 year (ref.)', '1-2 years', '2-3 years', '3-4 years', '4-5 years', '5-6 years' , '6-7 years', '7-8 years', 8-9 years' and '10 or more years'.

(2) *Age at first cohabitation (time-constant covariate).* We include the time-constant dummy variable 'early cohabitation' into our analysis, indicating that the woman's age at entry into first cohabitation was below 21 years. 'Late cohabitation' is the reference category and indicates that a woman was 21 years or older at entry into cohabitation.

(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 constitute the reference category.

(4) *Macro structural insecurity (time-dependent covariate).* To control for the impact of unemployment on the separation of a cohabitation or women's entry into marriage, we include the time-varying macro variable 'Unemployment rate' measured separately for East and West Germany (see Figure 1.7 on page 43). We attach the annually changing unemployment rate to each month of the year.

(5) *Historical period (time-dependent covariates).* In order to study historical periods in our analysis, we include four dummy variables: '1970-1979', '1980-1989', '1990-1999' and '2000-2010'. '1960-1969 (ref.)', is the reference category. Additionally, we include the following interaction dummy variables 'East*1970-1979', 'East*1980-1989', 'East*1990-1999' and 'East*2000-2010' to estimate possible differences between East and West German women.

(6) *Women's educational enrolment (time-dependent covariate).* We include a time-dependent dummy variable into our analysis having the value one, if a woman is enroled in education and zero otherwise.

(7) Woman's educational attainment level (time-varying covariate). 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 University of applied sciences degree is equivalent to 17 years; and a university degree is equivalent to 19 years.

(8) *Educational match of the partners (time-constant covariate).* We use information on the education of the partners at the beginning of the first cohabitation. For each partner, we distinguish four educational attainment levels in order to model upward, downward and homophilous cohabitations: (1) lower secondary or intermediate qualification without vocational training; (2) lower secondary or intermediate qualification with vocational training or upper secondary education (Abitur) with and without vocational training; (3) university of applied sciences degree; and (4) university degree. We define the following dummy variables: 'Woman = man (ref.)' to identify women who have a partner with the same level of education, 'Woman < man' for woman that are less educated than their partner and 'Woman > man' for woman that are better educated than their partner. In addition, we tested the following two interaction dum-

my variables 'East* Woman < man' and 'East* Woman > man' to estimate possible differences between East and West German women.

(9) *Children (time-dependent covariate).* To indicate, whether a cohabiting woman has no child, is pregnant, has a first child or has at least two children, we introduce the following dummy variables into our analyses: 'No child (ref.)', 'First pregnancy', 'First child', 'Second pregnancy,' and 'At least two children'. Because our data contains no information on pregnancies ending in miscarriage or abortion, our analyses are limited to conceptions taken from reported births. Furthermore, we include the following interaction dummy variables with the place of birth 'East*First pregnancy', 'East*First child', 'East*Second pregnancy,' and 'East*At least two children' to estimate the differences between East and West German women.

4.3 Results

In order to study possible differences in the structure of cohabitation in East and West Germany before and after German unification, we estimate survivor functions and discrete-time event history models with time-constant and time-varying covariates. We follow up women from the beginning of their first cohabitations until they enter into marriage or the dissolution of cohabitation. Cohabiting women are right censored when they have not had a transition into marriage or the separation of their first cohabiting union until the time of the retrospective interview.

4.3.1 Descriptive Overview

Table 4-1 shows the median duration of cohabitation in month before entry into marriage separately for East and West German women by birth cohort. Both columns show that women stay increasingly longer in cohabitation before marriage over the successive birth cohorts. In fact, the median duration of cohabitation has almost tripled in West

Table 4-1: Median duration of cohabitation (in month) before marriage, for various birth cohorts separately for East and West Germany

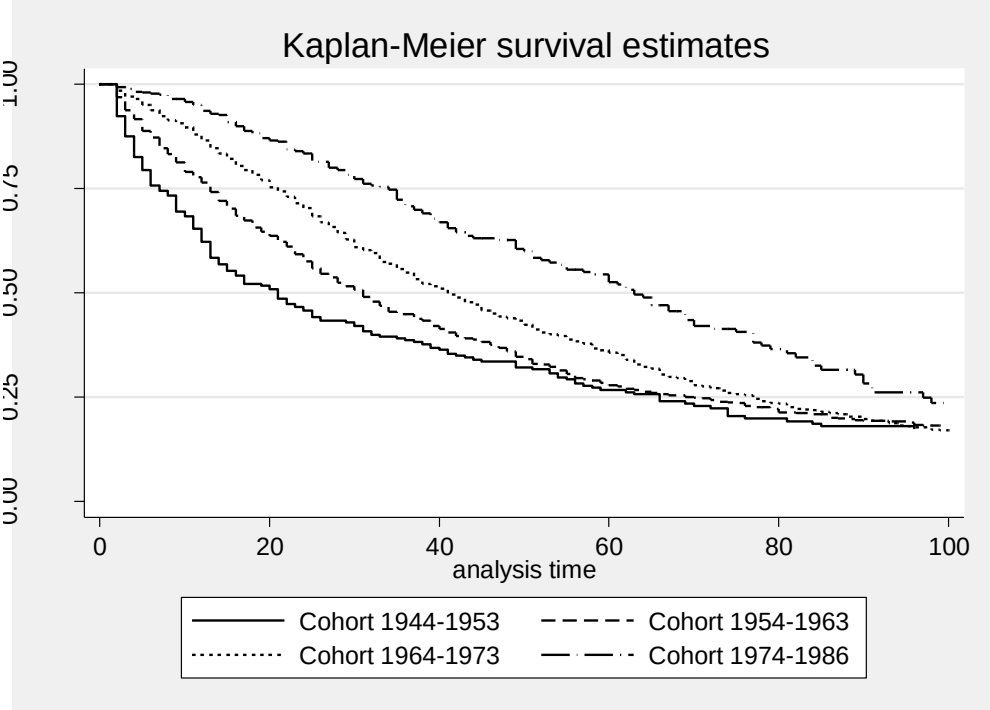
	East Germany	West Germany
Cohort 1944-1953	18	22
Cohort 1954-1963	20	32
Cohort 1964-1973	40	41
Cohort 1974-1986	75	62

Source: Estimations based on NEPS data from the adult study

Germany and more than tripled in East Germany across birth cohorts. While the median duration of cohabitation has been 18 month in East and 22 month in West Germany in the oldest birth cohort (cohort 1944-1953), it is 75 month in East and 62 month in West Germany in the youngest birth cohort (cohort 1974-1986). Thus, the increase in median duration in cohabitation before marriage has been somewhat stronger in East than in West Germany but within each cohort the difference between East and West Germany is quite small.

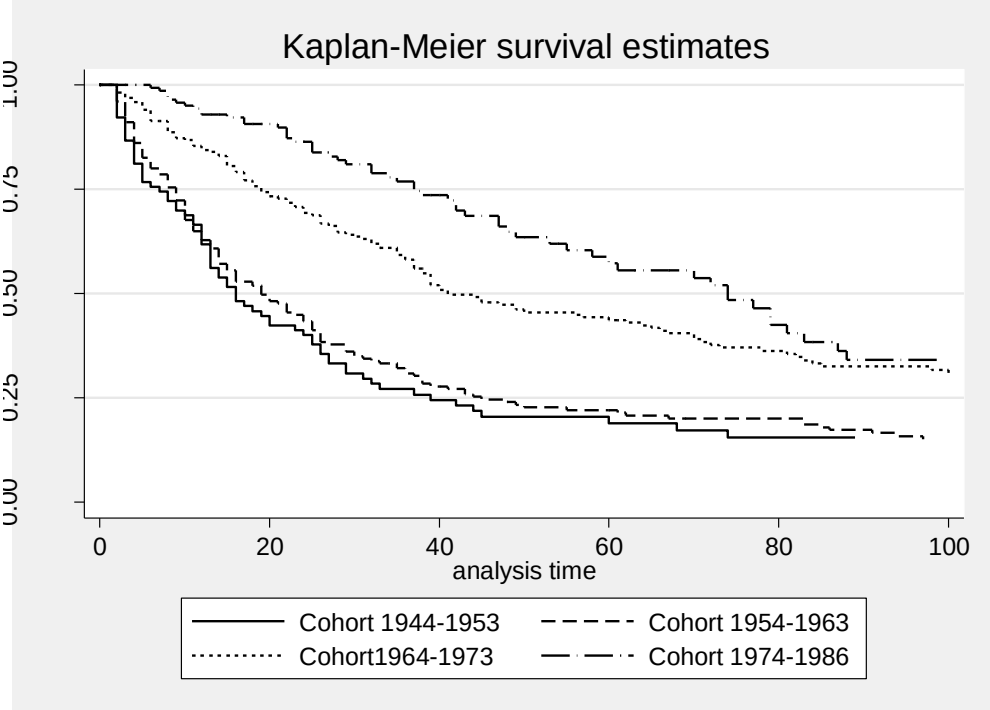
Figures 4.2 and 4.3 show the survivor functions for women's transition from first cohabitation to marriage in East and West Germany by birth cohort. These two figures reveal that it takes increasingly longer to enter into marriage across successive birth cohorts in both East and West Germany (support for hypothesis sixteen). This prolongation in cohabitation across cohorts also leads to a decline of marriage as an institution, since after very long durations an increasing proportion of women seem to stay in cohabitation. The survivor functions in Figure 4.2 suggest that between 20 and 25 per cent of all cohabitations in West Germany may not be part of the marriage process. In East Germany, this proportion is increasing from about 20 per cent among the oldest two cohorts to 32 per cent in the youngest cohort (see Figure 4.3). Thus, the percentage of cohabitations that have the character of an alternative to marriage is slightly higher in East Germany (32 per cent in East and 24 per cent in West Germany for the youngest birth cohort).

Figure 4.2: Survivor funktion West German women's transition from first cohabitation to marriage, by month



Source: Estimations based on NEPS data from the adult study

Figure 4.3 Survivor funktion for East German women's transition from first cohabitation to marriage, by month



Source: Estimations based on NEPS data from the adult study

The two oldest birth cohorts (cohort 1944-1953 and cohort 1964-1963) in East Germany, who have experienced the phase of family formation under the conditions of the GDR, entered into marriage much quicker than their West German counterparts. However, the survivor functions of the two oldest birth cohorts (see Figure 4.2and Figure 4.3) in East and West Germany are not very different. In East Germany, there has been a strong increase in the delay of entry into marriage beginning with birth cohort 1964-1973. The duration spent in cohabitation has almost doubled from one cohort to the next and increased even further in birth cohort 1974-1986. Hence, the survivor functions for the youngest birth cohorts in East and West Germany are slightly different.

4.3.2 Multivariate Analysis

Table 4-2 shows for first time cohabiting women the estimates of time-constant and time-varying covariates on the rates of entry into first marriage and dissolution as competing risks (see Section 1.5: 47pp). In order to test, whether the duration of cohabitation has an effect on both transitions, we include in each of the models in Table 4-2 nine dummy-variables indicating duration periods in years. The significantly positive coefficients for the duration of cohabitation show a bell-shaped pattern for women's dissolution of a first cohabitation. Women are initially increasingly dissolving their cohabiting unions (support for hypothesis ten). This trend is reaching a peak in the third year of cohabitation. Afterwards, the dissolution rate is declining. Otherwise said, the dissolution rate of cohabitation seems to be the result of an interplay of both the initially increasing tendency to resolve mismatches among the partners and the rise of cohabitation-specific investments. The likelihood for the transition into a marriage, on the other hand, is decreasing over time, since the coefficients for the duration of cohabitation are significant and increasingly negative over time. This supports Bennett, Blanc and Bloom's (1988) claim that longer periods of cohabitation create an inertia that makes the transition to marriage increasingly harder. Cohabiting partners seem

Table 4-2: Competing risk model for entry into first marriage or dissolution of first cohabitation

Variables	Marriage	Dissolution
Duration (time-dependent covariate)		
Up to 1 year (ref.)		
1-2 years	-0.748***	0.790***
2-3 years	-0.675***	0.914***
3-4 years	-0.797***	0.826***
4-5 years	-0.822***	0.803***
5-6 years	-0.762***	0.637***
6-7 years	-0.902***	0.775***
7-8 years	-1.168***	0.493*
8-9 years	-1.563***	0.250
10 or more years	-1.723***	-0.082
Age at entry into cohabitation		
Early cohabitation	-0.249***	0.061*
Late cohabitation (ref.)		
Place of birth (time-dependent covariate)		
West Germany (ref.)		
East Germany	-0.512**	-0.241
Macro structural insecurity (time-dependent covariate)		
Unemployment rate	-0.051***	-0.020
Historical Periods (time-dependent covariate)		
1960-1969 (ref.)		
1970-1979	-1.321***	12.310
1980-1989	-1.790***	12.659
1990-1999	-2.131***	12.592
2000-2010	-2.402***	12.865
East*1970-1979	0.491*	0.185
East*1980-1989	0.084	-0.137
East*1990-1999	0.240	0.367
East*2000-2010	0.746**	0.221
Education (time-dependent)		
Enroled in education	-0.705***	0.208*
Not enroled in education (ref.)		
Woman's educational attainment level (years)	0.021*	-0.035*
Educational match of the partners		
Woman > Man	-0.174**	0.493***
Woman = Man (ref.)		
Woman < Man	-0.010	-0.150
Children (time-dependent covariate)		
No child (ref.)		
First pregnancy	1.961***	-1.051**
Second pregnancy	0.539**	-0.689
First child	0.029	0.242
Two or more children	0.096	-0.048
East*First pregnancy	-0.850***	0.503
East*Second pregnancy	-0.026	0.351
East*First child	0.163	-0.551*
East*Two or more children	0.025	0.169
Intercept	-1.206***	-17.888
Number of events	2,181	747
Number of sub-episodes	144,043	144,043
Chi^2	3,916.91	190.83
Degrees of freedom	31	31

Note: *p<.05; *p<.01; ***p<.001; N=3,240; Source: Estimations based on NEPS data from the adult study

to develop couple specific costums and habits and are already enjoying the pooling of resources that living together provides so that the marriage decision is increasingly less obvious to them.

In order to study the effect of age at entry into first cohabitation, we include the dummy variable 'Early cohabitation' in our two models of Table 4-2. While the estimate for the dissolution of a first cohabitation is positive and significant, it is negative and significant for women's transition into first marriage. These results support Becker's et al. (1977) and Oppenheimer's (1988) presumption that couples who enter at a young age into a union have a lack of information about the partner market and therefore are less likely to marry and more likely to experience a separatation than couples who entered into a union at a higher age (support of hypotheses seven and eigth).

To test whether East and West German women differ with regard to entry into first marriage and the dissolution of a first cohabitation, we include a dummy variable for place of birth, the unemployment rate and dummy variables for the various historical periods as well as their interaction terms with East Germany into our models. The coefficients for the place of birth, the unemployment rate and the historical periods with their interaction effects for East Germany show that East and West German women do not differ with regard to the dissolution of their first cohabitation, since all the coefficients are insignificant. Hence, it seems that the dissolution of a first cohabitation is independent of place and time for women in Germany. Entry into marriage, on the other hand, is highly dependent on the place of birth, macro structural insecurity and historical periods. With regard to the unemployment rate, we can see the expected negative and significant effect on women's entry into first marriage (support for hypothesis eleven). In other words, cohabiting couples hesitate to make long-term binding decisions, such as marriage, in times of increasing economic uncertainty (Mills, 2008). The negative and significant dummy variable for East Germany confirms our

expectations that East German women transform their cohabiting unions less frequent into marriages than West German women. Finally, as expected, the coefficients of the dummy variables for the historical periods are significantly negative for women's entry into first marriage. These coefficients point to the erosion of normative objections against cohabitation in Germany over time. The interaction term 'East*1970-1979' reflects again that East German women entered earlier into marriage in the 1970s. The strong positive coefficient for the interaction term 'East*2000-2010' shows the expected catch-up effect of East German women in the marriage process after these women have delayed their marriage decisions during the uncertain transition period in the 1990s (support for hypotheses fourteen and fifteen).

It is well known, that union formation and dissolution processes are closely connected with education (Blossfeld & Huinink, 1989). Therefore, we have included the dummy variable 'Enroled in education', the variable 'Women's educational attainment level' as well as dummy variables for the educational match of the partners into our models in Table 4-2. Our estimates show that women are less likely to enter into a marriage when they are enroled in education (see the negative and significant coefficient) (support for hypothesis one), while they are more likely to experience the dissolution of a first cohabitation (see the positive and significant coefficient) (support fo hypothesis two). Both coefficients are in line with our expectations that women enroled in education are different in the process of family formation since they are in a much more immature social status than women who have already left the educational system. Women's educational attainment level does also have the expected positive and significant effect on women's entry into first marriage and the negative and significant effect on separation (support for hypotheses three and four). This suggests that higher educated cohabiting women make much more well-informed partner decisions. With regard to the educational match of the partners, we see that cohabitations, where women have a higher educational attainment level than their partner, are different.

If women have a higher educational attainment level than their partner, they are less likely to marry and are more likely to separate than all other educational matches. This speaks against the hypothesis that these women are only less traditional in terms of family, since they would then opt for cohabitation as a stable alternative to marriage and have a lower dissolution rate. Our results support much more the 'social pressure hypothesis' that this educational match is still atypical, rare and socially accountable in Germany. These cohabitations have a higher social hurdle to be transformed into long-term marriages and they are more easily separated compared to cohabitations with other educational matches among the partners (support for hypotheses five and six). If we include the interaction terms 'East*Woman<man' and 'East*Woman>man' (that are not reported in Table 4-2), the coefficients are insignificant and indicate that there are no differences between East and West Germany in the importance of partners' educational matches.

Finally, we have included time-dependent dummy variables indicating whether a cohabiting woman is pregnant, has given birth to a first child, is pregnant with a second child and has given birth to at least two children as well as the interaction terms of these dummy variables with East Germany into our models in Table 4-2. The significantly positive coefficient for 'First pregnancy' on women's entry into marriage shows that a premarital conception is one of the main reasons for women's transition to marriage in East and West Germany (Vascovics & Rupp, 1995), even though this effect is clearly less strong in East Germany (see the negative and significant coefficient of the interaction term) (support for hypothesis twelve). The arrival of a child is a good reason to convert a less-binding relationship into a long-term marriage. A premarital conception also stabilizes cohabitations, because it significantly reduces the risk of dissolution in East and West Germany. It is important, that only in East Germany, having a first child while cohabiting has no effect on the marriage rate, but a stabilizing effect on the cohabitation. This prevalence of first childbearing in cohabitation is evidence of, and contributes to the erosion of

traditional marriage norms and shows, that in East Germany, the importance of marrying to 'legitimate' a birth has become much less compelling (see also Bumpass, 1990). Also a second pregnancy has a positive effect on women's transition into marriage for both East and West German women (support for hypothesis thirdteen). However, this effect is less strong than for the first pregnancy. There is also no significant interaction effect for East German women. Thus, East German women differ from West German women mainly in the lower importance of first pregnancy for entry into marriage and the stabilizing meaning of the birth of a child on cohabitations.

4.4 Summary of Empirical Findings

In this chapter, we have studied to which extent the meaning of premarital cohabitation has become different in East and West Germany in the periods before and after German unification. Our analysis of the NEPS data shows that East and West German women stay increasingly longer in cohabitation before they enter into marriage over time. This trend across cohorts and historical periods has been very similar in East and West Germany. The median duration of cohabitation has significantly increased from 18 (cohort 1944-1953) to 75 month (cohort 1974-1986) in East and from 22 (cohort 1944-1953) to 62 month (cohort 1974-1986) in West Germany. Thus, the rising age at entry into marriage has at least partly been offset by an increasing duration of premarital cohabitation (see also Bumpass, 1990). Hence, the later marriage age should not be viewed as simply a period of extended singlehood (see also Bumpass, 1990). Many young people are setting up joint households almost as early in their lives as before marriage age increased (see also Bumpass, 1990). Of course, this has changed the meaning of both cohabitation and marriage in East and West Germany. What was once morally reprehensible has become the majority experience in just few decades (see also Bumpass, 1990). Today, sex and living arrangements depend less on marriage. Many young people choose cohabitation as a more

flexible living arrangement in a period of social immaturity and life course uncertainty. However, most of the cohabitations in East and West Germany are still a phase in the marriage process. In the youngest birth cohort (1974-1986), only 25 per cent of all cohabitations in West and 32 per cent in East Germany can be considered as alternatives to marriage. The biggest difference in the meaning of cohabitation in East and West Germany is the role of premarital conception and the prevalence of childbearing in cohabitations. While a premarital conception is one of the main reasons for women's transition to marriage in both East and West Germany, this effect is less strong in East Germany (support for hypothesis twelve and thirdteen). This erosion of traditional marriage norms in East Germany is also reflected by the stabilizing effect of the presence of a child on cohabitation. Hence, the importance of marrying to 'legitimate' a birth has become much less compelling in East Germany. Thus, our conclusion is therefore that cohabitation has many similarities in East and West Germany, but if it comes to childbearing there is a big difference between both parts of Germany. The different pathway of East German women was initiated by the pronatalist policies in the GDR that supported young mothers even if they were not married. It seems that the difference in the link between marriage and fertility has then become stronger among the younger birth cohort after German unification. It remains to be seen, whether this divergence between East and West German women will continue among the younger birth cohorts in the future even if both parts of Germany are unified.

Our results further revealed that entry into cohabitation at a young age increases the risk of nonmarital union dissolution and decreases the chances for these women to experience the transition into a first marriage (support for hypotheses seven and eight). Furthermore, the duration of cohabitation plays an important role in women's entry into marriage and union dissolution. While longer periods of cohabitation cause an inerta that makes it harder for these couples to enter into marriage (support for hypothesis nine), the

dissolution of cohabitation has a clear bell-shaped pattern (support for hypothesis ten). At first, cohabitations are increasingly separated in order to resolve mismatches. This underlines the importance of cohabition as a trial marriage and supports the weeding hypothesis by Hoem (1986). But with increasing duration, the cohabitations are becoming increasingly more stable. As shown in the previous chapter, the likelihood to enter into a marriage decreases with increasing uncertainty and cohabiting couples are less willing to make long-term binding decisions in periods of economic uncertainty. The dissolution of cohabitation, on the other hand, is not affected by time and place as well as macro-structural insecurity.

Educational enrolment decreases women's likelihood to experience the transition into a marriage and, at the same time, increases the likelihood of the dissolution of cohabitations (support for hypotheses one and two). Better educated women experience the transition into marriage more often and a separation less often than less educated women. The educational match among the spouses shows that women with a less educated partner have a higher rate of dissolution of cohabitation and a lower marriage rate (support for hypotheses five and six). Thus, it seems that this atypical and rare educational match among the partners risks negative judgements from friends, relatives and collegues and is still socially accountable in Germany. This means that the diffusion of cohabitation, to some extend, acts as a structural filter that decreases the rate of marriage if women have a higher educational attainment level than their partner.

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5 Educational Homophily and Educational Homogamy: The Impact of Mother's Role Models on Daughter's Cohabitation and Marriage

In the last three chapters, we have shown that women do not only delay marriage but they also enter more often and stay longer in cohabitation. In Chapter Three, we have analysed how women's educational enrolment and educational attainment level influence their entry into first cohabitation and first marriage in East and West Germany. In Chapter Four, we have studied the effect of women's educational enrolment, educational attainment level and the educational match among the partners on women's transition from cohabitation to marriage and union separation in both parts of Germany. Our results show that educational matches among the partners play an important role for the transition from cohabitation to marriage. If women have a higher educational attainment level than their partners cohabitations are significantly less often turned into marriages and are more often dissolved than cohabitations with other educational partner matches. In this chapter, we focus on the process of educational assortative mating in more detail.

Previous research has mainly analysed women's educational assortative mating with regard to entry into marriage (Blossfeld, 2009; Blossfeld & Timm, 2003; Klein, 1997; Schwartz & Mare, 2005; Teckenberg, 1991, 2000; Wirth, 1996, 2000). What is clearly missing is an analysis of women's educational assortative mating with regard to entry into cohabitation (principle of linked lives & timing of events and transitions, see Chapter 1.3). Furthermore, there has been no research on the effects of mother's role model on daughter's union formation processes (principle of linked lives, see Chapter 1.3). In this chapter, we analyse the effects of mother's role models on daughter's educational assortative mating with regard to entry into first marriage and entry into first cohabitation for both East and West German women. Like the previous chapters, this chapter is structured as follows: First, we formulate testable hypotheses based on a theoretical discussion.

Then, we describe the variables used in our competing risk analysis and present the empirical findings of our estimations. The chapter ends with a summary of the results.

5.1 Theoretical Framework and Hypotheses

5.1.1 Educational Assortative Mating: Do Opposites Attract or Like Marries Like?

Partner selection of young men and women is the result of a long-term, continuous and cumulative life course process (Lichter et al., 1995) (life span development, see Chapter 1.3). This process starts off in the family of origin during childhood and youth (principle of linked lives, see Chapter 1.3), with its economic and cultural conditions as well as social norms and values. It spreads when young adults are selected into various tracks of the educational system and enter into vocational training and universities (timing of events and transitions, see Chapter 1.3). After their entry into the employment system it differentiates even further into the job careers and occupational fields. During these transition processes over the life course, the social networks of the individuals tend to change and shape the opportunities to meet potential partners in everyday activities.

Previous research has shown that there are two typical partner matches. On the one hand, young men and women tend to choose a partner with personal characteristics similar to their own. This positive assortative mating (Becker, 1981), for example, means that prospective partners have the same educational attainment level, the same intelligence or similar cultural and social class backgrounds or religious beliefs. People who have the same individual characteristics can profit from each other because these similarities normally produce a better mutual understanding, make interactions less costly and relationships much more rewarding (Blau, 1994 ;Becker, 1981). For example, if two smart people associate this should have a higher utility for both partners than a match between a less smart partner and a smart partner. On the other hand, men and women might also profit from choosing a partner with opposite characteristics (negative assortative mating; see

Becker, 1981). This is usually the case in societies where strong gender-specific divisions of work exist and the socialisation processes produce pronounced gender-specific specializations of skills (Huinink & Konietzka, 2007). For example, in a traditional family system men can expect to benefit from their female partners, since women have been socialized to be more productive in the household and raising children (see Becker, 1981); and women can benefit from their male partners since men have specialized in lifelong gainful employment (see Becker, 1981). The selection of a partner is in general the result of a competitive process "in which many individuals attempt to achieve the best possible bargain for themselves [...]" (Elder, 1969: 519).

Partner and spouse selection is typically made in the transition phase from youth to adulthood. This may happen during the phase of educational enrolment or after the entry into the employment system. The timing when individuals leave the educational system and enter into the labour market is shaped by the educational and employment institutions. As shown in Chapter Three, participation in the educational system is connected with economic dependence (e.g. from the parents and the state) and reduces women's readiness to enter into a partnership. Thus, our first hypothesis is that the enrolment in the educational system reduces the rate of entry into a first union independent of the educational match of the partners. However, the educational system in Germany is also expected to have an important impact on educational assortative mating over the life course (Blossfeld & Timm, 1995). The educational system not only determines how long women are enrolled in the educational system but also selects women into different educational tracks. After primary education, students in Germany are separated into one of the three different types of school: (1) lower secondary education (Hauptschule), (2) middle school (Realschule) or (3) upper secondary education (Gymnasium). This creates relatively homogenous groups of students in classrooms and schools already at an early stage of the educational career. After finishing school, people enter either in vocational training or

into the tertiary educational system. This process of stepwise homogenisation with regard to education has important consequences for social networks, since individuals tend to choose partners from groups with shorter social distance rather than those with longer social distance (Goode, 1982; Blau, 1994). In other words, educational selection over the life course increases the likelihood of establishing a social relationship with a similarly qualified partner. This is true for both contacts within formal educational institutions and informal interactions in everyday life activities. Educationally disadvantaged women leave the educational system in Germany at younger ages and enter then earlier in more heterogeneous social networks in the labour market and the employment system. Hence, the chances of meeting a partner with the same educational attainment level are structurally decreased for less qualified women at a younger age. Due to the selection procedure in the educational system, the social networks within the educational system become increasingly more homogenous with regard to the educational attainment level of young people. Put another way, better educated women interact longer in educationally homogenous networks and the educational system is becoming a marriage market. We therefore expect that the higher women's educational attainment level, the higher the likelihood to start a marital or nonmarital union with a partner who has the same educational level (second hypothesis). Since cohabitations are particularly likely as long as people are still enrolled in school or participate in tertiary education, we expect the likelihood to live together with an equally qualified partner to be particularly high for better qualified women in education (third hypothesis). If women's educational attainment level is increasing, it is getting harder to find a partner with a higher educational attainment level (ceiling effect). We therefore expect the higher women's education, the lower the rate that a marital or nonmarital union is formed with a partner with a higher educational attainment level (upward union formation) (fourth hypothesis). On the other hand, if women's educational attainment level is increasing, it is more likely for them to meet a partner with a lower

educational attainment level (bottom effect). We therefore expect, the higher women's education, the higher the rate that a marital or nonmarital union is formed with a less educated partner (downward union formation) (fifth hypothesis).

5.1.2 Intergenerational Transmission of Gender Roles

Social norms and gender roles can be transmitted within and outside the family. In this chapter, we focus on the transmission of roles and norms within the family from one generation to the next (principle of linked lives, see Chapter 1.3). This transmission usually occurs through primary and secondary socialization processes within families. Previous research by Rosenthal (1985) has shown that family roles are transmitted from parents to children. If mothers have chosen a partner with a lower educational attainment level, they do not behave according to the 'stereotypes' in traditional 'male-breadwinner' societies (Rosenthal, 1985). Since they act as role models for their children, this increases the likelihood that their daughters will also adopt a similar role as their mothers within their own partnership (Rosenthal, 1985; Beaman, Duflo, Pande & Topalova, 2012). Farré and Vella (2013) find that mothers with less traditional views about the role of women in society are more likely to have daughters without these traditional views. Put in a different way, if mothers live less traditional, their daughters are also very likely to live accordingly. We therefore formulate a sixth hypothesis: If a mother has less traditional gender role attitudes and lives in a partnership with a less educated partner, we expect their daughters not only to have a higher likelihood of cohabiting but also having a partner with a lower educational attainment level. In contrast, we expect in our seventh hypothesis that women growing up in families with very traditional gender-roles will share similar values and beliefs as their mothers and will therefore not only be more likely to enter into a marriage (without previous cohabitation) but also to have a higher educated partner.

5.1.3 Further Differences in Assortative Mating

Place of Birth (principle of place and time, see Chapter 1.3*).* As shown in the previous three chapters, marriage has been the dominant living arrangement in East and West Germany. Nevertheless, the proportion of women who have ever lived in a nonmarital union before first marriage has been rising for decades in both parts of Germany (see also Nazio, 2008). According to our analysis, the process of diffusion of cohabitation before entry into first marriage has been very similar in East and West Germany. We therefore expect that East and West German women enter increasingly more often into cohabitation rather than marriage over successive decades – independent of the educational match of the partners (eighth hypothesis).

Yet, we have also demonstrated that in East and West Germany a pregnancy still constitutes one of the main reasons to enter into a marriage, though this effect is less strong in East Germany. We expect therefore that single West German women have a higher rate of entry into first marriage when they are expecting their first child – independent of the educational match of the partners (ninth hypothesis). Furthermore, based on our results in chapter three, we also predict that East German women are more likely to enter into a first union – independent of the educational match - when they have got a first child (tenth hypothesis).

Macrostructural insecurity (principle of agency, see Chapter 1.3*).* In Chapter Three, we have demonstrated that uncertainty such as labour market insecurity may cause a delay of entry into marriage, while more flexible partnerships are not affected. This delay of entry into marriage should be less important if women are better educated than their partners (downward marriage). Thus, we expect that economic uncertainty is particularly delaying homogamous and upward marriages (eleventh hypothesis).

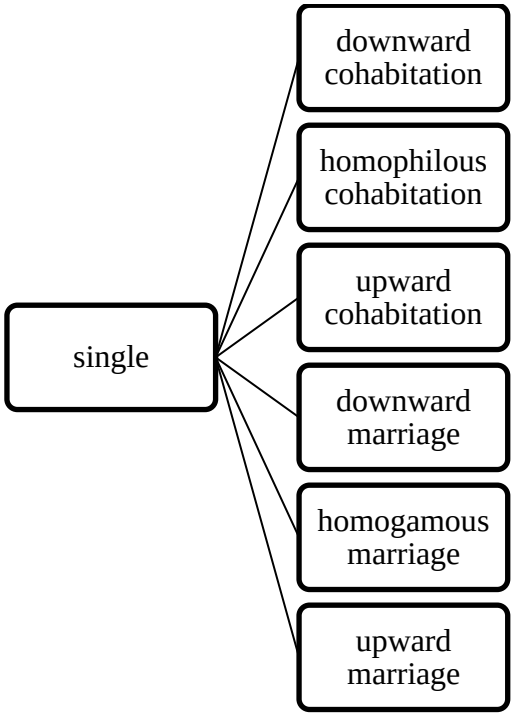
Cohort trend (principle of place and time, see Chapter 1.3*).* As shown previously in Chapter Two, premarital cohabitation has become increasingly common and less stigmatized across cohorts. At the same time, women participate increasingly longer in education and interact longer with educationally homogeneous people across cohorts. Hence, we predict that cohabitations, where the partners have the same educational attainment level, are particularly increasing across cohorts (twelfth hypothesis).

Age dependency (life span development, see Chapter 1.3*).* As shown in Chapter Three, it is important to control for a bell-shaped age pattern of women's entry into first cohabitation and first marriage, since the rate of entry into a first union rises with age, reaches a peak and then decreases. This should be true for both entry into first cohabitation and entry into first marriage and for all educational partner matches (thirteenth hypothesis).

5.2 Definition of Variables

Dependent variables. Based on the NEPS data set (see Section 1.4: 41 pp), we use information on the education of the partners at the beginning of the first union, being it cohabitation or marriage. For each partner, we distinguish four educational attainment levels: (1) lower secondary or intermediate qualification without vocational training; (2) lower secondary or intermediate qualification with vocational training or upper secondary education (Abitur) with and without vocational training; (3) university of applied sciences degree; and (4) university degree. Based on these four hierarchical levels, we define the following six destination states: (1) 'downward cohabitation' for women who cohabit with a less educated partner, (2) 'homophilous cohabitation' for women who cohabit with a partner with the same level of education, (3) 'upward cohabitation' for women who cohabit with a better educated partner, (4) 'downward marriage' for women who marry a less educated partner, (5) 'homogamous marriage' for women who marry a partner with

Figure 5.1: Competing risks for the transition into first union and different educational matches of the partners



Source: Own diagram

the same level of education, and (6) 'upward marriage' for women who marry a better educated partner (see Figure 5.1).

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

(1) *Age dependency (time-dependent covariate).* To model the non-monotonic shape of entry into first union across age, we include two variables, 'Log (current age-15.9)' and 'Log (67.1-current age)', which allow us to flexibly test different base-line shapes across age.

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

(3) *Macro structural insecurity (time-dependent covariate).* To control for the influence of unemployment on entry into first union, we include the time-varying macro variable 'Unemployment rate' measured separately for East and West Germany (see Figure 1.7 on page 43). We attach the annually changing unemployment rate to each month of the year.

(4) *Historical periods (time-dependent covariates).* To differentiate historical periods in our analysis, we include dummy variables distinguishing five historical periods: '1960-1969 (ref.)', '1970-1979', '1980-1989', '1990-1999' and '2000-2010'. In addition, we include four interaction dummy variables 'East*1970-1979', 'East*1980-1989', 'East*1990-1999' and 'East*2000-2010' to estimate possible differences between East and West German women.

(5) *Linear cohort trend (time-dependent covariate).* To control for structural changes in the diffusion of cohabitation versus marriage, we include a variable that has the value '1' for birth cohort 1944-1953, '2' for birth cohort 1954-1963, '3' for birth cohort 1964-1973 and '4' for birth cohort 1974-1986.

(6) *Educational match of the parents (time-constant covariate).* We use information on the education of the parents. Unfortunately, we do not have any information on parents' type of union. Hence, we can only analyse the effect of parent's educational match. To model upward, downward and homophilous unions of the parents, we distinguish four hierarchical educational attainment levels: (1) lower secondary or intermediate qualification without vocational training; (2) lower secondary or intermediate qualification with vocational training or upper secondary education (Abitur) with and without vocational training; (3) university of applied sciences degree; and (4) university degree. Based on this scheme, we distinguish the following three dummy variables: 'Mother = father

(ref.)' if the parents have the same educational attainment level, 'Mother < father' if the mother is less educated than the father, and 'Mother > father' if the mother has a higher educational attainment level than the father.

(7) *Women's educational enrolment (time-dependent covariate).* We include a time-dependent dummy variable to indicate whether a woman is enrolled in education. Women, who have left the educational system, constitute the reference category.

(8) Woman's educational attainment level (time-varying covariate). 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 university of applied sciences degree is equivalent to 17 years; and a university degree is equivalent to 19 years. In addition, we include the interaction dummy variable 'Enrolled in education*Educational attainment level' in our model for homophilous cohabitations.

(9) *Children (time-dependent covariate).* To indicate, whether a single woman has no child, is pregnant or has at least one child, we introduce the following dummy variables into our analyses: 'No child (ref.)', 'First pregnancy', and 'At least one child'. The beginning of the first pregnancy was reconstructed using the information of the timing of the first birth. Furthermore, we include the following interaction dummy variables with the place of birth 'East*First preg-

nancy', and 'East*At least on child' to test possible differences between East and West German women.

5.3 Results

Using discrete-time event history models with time-constant and time-varying covariates (see Section 1.5: 47pp), we analyse single women's transition into first union with different educational partner matches as competing events in Germany. We follow up single women from age 16 until they make the transition to first (downward, homophilous or upward) cohabitation or first (downward, homogamous or upward) marriage. Single women are right censored when they have not had a first (marital or nonmarital) union until the time of the retrospective interview.

Table 5-1 shows the estimates for the six competing transitions. In order to test, whether there is a non-monotonic age dependency for women's transition into first union with different educational partner matches over the life course, we include in each of the six models in Table 5-1 two dummy-variables: 'Log (current age-15.9)' and 'Log (67.1- current age)'. In all six models, the coefficients of these two dummy variables are positive and significant. This suggests that single women's entry rates into downward, homophilous and upward cohabitation as well as downward, homogamous and upward marriage are indeed initially rising, reaching a peak and then decreasing with increasing age. Since in each of the six models, the coefficient for 'Log (67.1-current age)' is greater than the coefficient for 'Log (current age -15.9)' these bell-shaped curves are all right-skewedm (support for hypothesis thirdteen).

We have also included a linear cohort trend in our six models of Table 5-1 in order to test whether cohabitations, where the partners have the same educational attainment level, are particularly frequent across cohorts. While the estimate is positive and significant for women's entry into homophilous cohabitation, it is statistically insignificant for all other

Table 5-1: Competing risk models the transition into first union and different educational matches of the partners

Variables	Cohabitation			Marriage		
	Downward	Homophily	Upward	Downward	Homogamous	Upward
Age dependency (time-dependent covariate						
Log (age-15.9)	0.636**	1.187***	1.048***	0.705*	2.077***	1.499***
Log (67.1-age)	3.501***	5.826***	5.365***	2.852*	12.023***	5.598***
Cohort trend						
Linear cohort trend	0.225	0.232***	-0.028	0.033	-0.171	-0.208
Place of birth (time-dependent covariate)						
West Germany (ref.)						
East Germany	-11.361	-0.249	0.708*	-1.402	-0.379	0.515*
Macro structural insecurity (time-dependent covariate)						
Unemployment rate	-0.039	-0.021	0.010	-0.092	-0.089***	-0.084*
Historical Periods (time-dependent covariate)						
1960-1969 (ref.)						
1970-1979	0.186	1.099***	1.214***	-0.422	-0.108	0.059
1980-1989	0.543	1.380***	1.084***	-1.003	-0.307	-0.365
1990-1999	0.523	1.279***	1.154***	-1.159	-0.532*	-0.600
2000-2010	0.411	1.050***	1.191***	-1.620	-0.941**	-0.533
East*1970-1979	11.287	0.145	-0.578	1.112	0.250	-0.631*
East*1980-1989	11.053	-0.091	-0.825*	1.402	0.099	-0.690*
East*1990-1999	11.708	0.671	-0.615	1.323	-0.079	-1.864*
East*2000-2010	11.743	0.789	-0.989*	2.721	0.946	-0.026
Children (time-dependent covariate)						
No child (ref.)						
First pregnancy	1.521***	1.338***	1.636***	3.343***	2.838***	2.960***
At least one child	0.261	-0.816***	-0.413*	-0.173	-0.426*	-0.787**
East*First pregnancy	-0.387	0.211	-0.826**	-1.070	-0.333	-0.552*
East*At least one child	-0.822	0.645**	0.155	-0.185	0.471	0.759*
Education (time-dependent)						
Enrolled in education	-0.444***	-1.550***	-0.315***	-0.796**	-1.152***	-0.311**
Not enrolled in education (ref.)						
Woman's educational attainment level (years)	0.492***	0.019	-0.143***	0.355***	0.025	-0.172***
Enrolled in education*Women's educational attainment level		0.058**				
Family background: parent's education (time-constant covariate)						
Mother > father	0.589**	0.009	-0.175	0.578	-0.059	-0.181
Mother = father (ref.)						
Mother < father	0.089	-0.005	0.083	0.009	-0.137	0.181*
Intercept	-29.105***	-31.283***	-27.441***	-23.965***	-54.358***	-27.498***
Number of events	380	1,798	1,061	151	945	193
Number of sub-episodes	571,328	571,328	571,328	571,328	571,328	571,328
Chi^2	793.07	1464.35	469.11	261.41	2029.13	1206.46
Degrees of freedom	21	22	21	21	21	21

Note: *p<.05; **p<.01; ***p<.001; N=5,340; Source: Estimations based on NEPS data from the adult study

destination states (downward and upward cohabitation as well as downward, homogamous and upward marriage). In other words, it is particularly cohabitation, where both partners have the same educational attainment level, that are spreading across cohorts (support for hypthesis twelve).

In order to study, whether there are differences between East and West Germany with regard to women's entry into downward, homophilous and upward cohabitation as well as downward, homogamous and upward marriage, we include the unemployment rate, a dummy variable for place of birth, and dummy variables for historical periods as well as their interaction dummy variables with East Germany into our six models (see Table 5-1). In Chapter Three, we have shown that macro-structural insecurity in terms of high unemployment rates reduces women's rate of entry into marriage, but does not affect women's entry into cohabitation (see Table 3-1, p.100). Now, we see in Table 5-1 that the negative effect on the marriage rate is limited to couples where women have the same or a lower educational attainment level than their partners (support for hypothesis eleven). Thus, it seems that these types of marriages are particularly vulnerable with regard to economic uncertainty. In these matches, women are more dependent on their partners than women who are marrying downwardly. In Chapter Three, we also demonstrated that there is an increasing rate of women's entry into first cohabitation and a declining rate of women's entry into first marriage in East and West Germany across decades (see Table 3-1, p.100). Now, we see that cohabitations and marriages, where women have a higher educational level than their partners, do not change across periods (see Table 5-1). Expressed differently, the partner matches that contradict the male breadwinner model did not increase over time. However, we can see that the increase of homophilous cohabitations is mainly on the expense of homogamous marriages. The significantly positive dummy variable 'East Germany' for entry into upward cohabitation and upward marriage indicates that East German women enter more often into unions that are following the male breadwinner logic. However, the interac-

tion terms between East Germany and the historical periods make clear that upward cohabitation and upward marriage is increasingly less likely in East Germany across decades. Otherwise said, while East German women in the GDR entered more frequently into upward cohabitations and upward marriages, they opt less for this traditional male breadwinner model after German unification.

As shown in Chapters Three and Four, fertility and union formation processes are closely connected in Germany. Therefore, we have included time-dependent dummy variables indicating whether a single woman is pregnant with a first child or has given birth to at least one child as well as the interaction terms of these dummy variables with East Germany into our six models in Table 5-1. The positive and significant coefficients of the variable 'First pregnancy' show that a first pregnancy constitutes a strong reason for women to enter into a first cohabitation and first marriage independent of the educational partner match. As expected and shown in Chapter Three, this effect is much stronger for all educational partner matches connected with marriage. The interaction term 'East*First Pregnancy' indicates that the effect of first pregnancy is less strong for women who marry or cohabit upwardly in East Germany (particial support for hypothesis nine). As soon as the first child is born, the rate of entry into homophilous or upward cohabitations and homogamous or upward marriages decreases significantly, though less strong in East Germany for homophilous cohabitations and upward marriages (support for hypothesis ten).

Finally, we have included various educational variables into our models in Table 5-1: (1) being enrolled in education (time-dependent covariate), (2) woman's educational attainment level (time-dependent covariate), and (3) the educational match of the parents (time-constant dummy variables). The estimates show that women are less likely to enter into a first union when they are enrolled in education – independent of being it a downward, homophilous or upward cohabitation or downward, homogamous or upward mar-

riage (support for hypothesis one). This supports our results from Chapter Three that women's educational dependence during educational participation reduces their readiness to enter into a first union. Women's educational attainment level, on the other hand, does not have a significant effect on women's entry into homophilous cohabitation and homogamous marriage (rejection of hypothesis two). This clearly contradicts our hypothesis that the higher women's educational attainment level, the higher the likelihood that women start a marital or nonmarital union with a partner who has the same educational level. For women's entry into homophilous cohabitation, we have therefore additionally included the interaction term 'Enrolled in education*Educational attainment level'. This coefficient is positive and significant and therefore supports our predications that cohabitations, where the partners have the same educational attainment level, are more likely if women have a higher educational attainment level and are still participating in education (support for hypothesis three). In other words, the educational system indeed acts as partner market. The estimates for women's downward cohabitation and downward marriage are positive and significant, while they are negative and significant for women's entry into upward cohabitation and marriage. This is in line with our expectations, since the higher a women is educated, the harder it gets for her to meet a better educated partner (ceiling effect) (support for hypothesis four) and the more likely it is for her to meet a less educated partner (bottom effect) (support for hypothesis five).

Finally, we study the effect of mother's role model on daughter's educational assortative mating and include two dummy variables 'Mother < father' and 'Mother > father' into our six models (see Table 5-1). The estimates show two positive and significant coefficients, supporting the role model hypothesis (support for hypotheses six and seven). On the one hand, a woman is more likely to cohabit with a less educated partner, if her mother has a higher educational attainment level than her father. On the other hand, a woman is more like-

ly to marry a better educated partner, if her mother has a lower educational attainment level than her father.

5.4 Summary of Empirical Findings

In this chapter, we have studied single women's transition into first cohabitation and first marriage with different educational partner matches as competing events. Our analysis of the NEPS data shows that mother's role model has an influence on daughter's educational assortative mating. Mothers with a less educated partner have daughters that are also more likely to cohabit with a less educated partner (hypothesis six). In contrast, mothers that are in a more traditional union, where the father has a higher education than the mother, have also significantly more often daughters marrying a better educated partner (hypothesis seven). Not only the educational match of the parents has an influence on daughter's educational partner matches, but also women's educational enrolment and women's educational attainment level are important. Educational enrolment reduces women's risk to enter into a first union – independent of the educational partner match and the type of first union (hypothesis one). The higher women's educational attainment level, the harder it is for them to find a better educated partner (ceiling effect) (hypothesis four) and the more likely it is to associate with a less educated partner (bottom effect) (hypothesis five). There is no effect of women's educational attainment level on women's transition into homophilous cohabitation and homogamous marriage. However, cohabitations among equally qualified partners are more likely if women are better educated and if they are still enrolled in education (hypothesis three). In other words, the educational system functions as a partner market.

Our results further revealed that the transition into first union with different educational partner matches has a bell-shaped pattern that initially increases with age, reaches a peak and then decreases (hypothesis thirdteen). Macro-structural insecurity in terms of the

unemployment rate does not effect cohabitation, irrespective of the educational partner match (hypothesis eleven). Yet, it has a delaying effect on women's entry into homogamous and upward marriage, though not on downward marriage. This indicates that women, who marry a less educated partner, are more independent than women who marry homogamous or upward and that these downward marriages are less affected by economic uncertainty. In the GDR, women entered more often into upward cohabitations and upward marriages. After the German unification, entries into traditional partner matches, however, have significantly declined in East Germany. Across periods, women's entry into cohabitation and marriage with a less educated partner did not increase. However, there has been a decline in homogamous marriages on the expense of homophilous and upward cohabitations. Cohabitations, where the partners have the same educational attainment level, have not only spread across decades but also across birth cohorts (hypothesis twelve).

Finally, our analyses showed that pregnancies accelerate women's transition into a first union, being it downward, homophilous or upward cohabitation or downward, homogamous or upward marriage. In other words, the first pregnancy still constitutes one of the main reasons for the transition into a first union, though this effect is less strong for women's entry into cohabitation. In addition, East German women are also less likely to enter into cohabitation or marriage during pregnancy when they have a better educated partner (partical support for hypothesis ten). As soon as a child is born, women's transition rates decrease significantly for homophilous and upward cohabitation as well as homogamous and upward marriage, though less strong for East German women's entry into homophilous cohabitation and upward marriage (support for hypotheses nine and ten).

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6 What Influences the Rate of Entry into First Motherhood for Women Enrolled in Full-Time Education?

In recent decades, the fertility behaviour of women in East and West Germany has changed drastically. Today, German women are faced with low fertility (Billari & Kohler, 2004; Kohler, Billari & Ortega, 2002; McDonald, 2006; 2009) and an increasing age at entry into first motherhood across birth cohorts (Huinink & Wagner, 1995; BMFSFJ, 2005). These changes in fertility have not occurred in isolation. They have been closely connected with increasing participation in the educational system in East and West Germany (Huinink & Wagner, 1995). Compared to men, women's educational attainment level has particularly risen and they have even surpassed men among upper secondary school graduates (*Abitur*) and university freshmen (Authoring Group Bildungsberichterstattung, 2010; 2012; 2014). Higher educational attainment across cohorts, however, also means increasingly longer educational participation over the life course from one cohort to the next. Therefore, with rising age, there might be an increasing likelihood for women entering motherhood as long as they are participating in the educational system.

In other words, for more and more young women there is an increasing conflict between educational participation and the realization of the desire to have a child. This conflict is partly reflected by the increasing age at entry into first motherhood, since more and more women postpone the entry into first motherhood until they have left the educational system (Blossfeld & Huinink, 1991). But still, some women get their babies while enrolled in full-time education. There are many life course studies analysing women's changing relationships between education, labour market participation and fertility. However, they did not study in detail the conflict between educational participation and fertility of women in full-time education. What is also missing is an analysis of this relationship in East and West Germany before and after German unification.

Although East and West Germans share the same history, after World War II, 40 years of socialism in the former German Democratic Republic (GDR) and conservative welfare state capitalism in the Federal Republic of Germany (FRG) have resulted in different life course patterns in the two parts of Germany (Dahlerup, 1994). In East Germany, the state provided economic security through guaranteed employment, subsidized marriage and births; it offered easy access to divorce and provided extensive family leave, free child care and easy abortion. By contrast, the West German state considered marriage and child care for several decades predominantly a private matter. It was oriented towards the traditional model of the male breadwinner (or at least the primary-earner) model and married females were typically regarded as homemakers or part-time workers. After German unification, the law, the currency as well as the political and institutional structures of West Germany were imposed on the Eastern part of Germany so that the life course options of East Germans changed abruptly and dramatically.

In particular, East German women's conflicts between education and fertility as well as work and fertility have increased strongly. For example, in the former GDR, broad coverage of free child care was reduced from 58 per cent (in 1991) to 33 per cent (in 1996) for small children (aged 0-3) and for older children (aged 3-6) from 89 per cent (in 1991) to 85 per cent (in 1996) (Kreyenfeld & Geisler, 2006). In addition, parental co-payments based on family income were introduced, at least charging a basic fee to almost every family. Thus, the cut through German unification has been particularly drastic for mothers with children under the age of three, and it clearly indicates that the policies of the unified Germany encourage women to care for their own children at home for the first few years. However, German unification did not only affect child care but also led to a cut in pronatalist policies that were introduced in East Germany in the early 1970s (Nave-Herz, 2004). These policies supported mainly women enrolled in education. From the 1970s onwards, these women in the GDR were eligible for special financial support,

which made them (to a certain extend) financially independent from a partner or parents. Especially, women in education were also allowed to move into their own publically subsidized housing. The sudden end of these policies after unification has, therefore, led to a massive increase in the conflict between educational participation and motherhood in East Germany.

In this chapter, we focus on entry into motherhood of women who are enrolled in full-time education in East and West Germany (timing of events and transitions & principle of place and time, see Chapter 1.3). Its aim is to study changes in the long-term development of educational participation and entry into motherhood using new life course data from the 'National Educational Panel Study' (NEPS). This dataset is particularly useful for an analysis of the impact of the German unification on women's entry into motherhood during educational participation in East and West Germany, since we can draw on longitudinal data from birth cohorts born between 1944 and 1986. In particular, it allows a difference-in-differences analysis of the effects of changing state support for mothers in education before and after unification in East Germany and to compare these developments with changes in West Germany.

The chapter is organized as follows. First, based on several theoretical approaches we formulate testable hypotheses and define the variables used. Second, we report the results of our longitudinal analysis. Finally, this chapter concludes with a summary of the results.

6.1 Theoretical Framework and Hypotheses

6.1.1 Cohort Differentiation and German Unification

Different theoretical models have been developed in order to explain the timing of motherhood over the life course for successive cohorts. Ryder (1965) has shown that historical changes often have different implications for individuals in various life stages. If these effects are long-lasting, there will be a cohort differentiation. In this chapter, we are

specifically interested in the consequences of the German unification leading to abrupt policy discontinuation in East Germany for women who have got a baby while in education. This kind of policy change might lead to different age-specific experiences of women particularly in East Germany and, therefore, to diverse birth-cohort specific adaption processes with lasting effects on completed fertility. The first hypothesis for our descriptive analysis is therefore that the fertility behaviour of East German women in full-time education is more strongly affected by German Unification than the fertility behaviour of West German women enrolled in education.

6.1.2 Life Course Approach: Normative Timing and Normative Sequencing of Events

Life course studies have shown that normative sequences exist with regard to various life course transitions (Marini, 1984; Settersten & Mayer, 1997). For example, Hogan (1978) demonstrated that individuals move from school to work and then to marriage as well as parenthood (timing of events and transitions & principle of agency, see Chapter 1.3). In order to satisfy this sequencing norm, young adults will be less likely to enter parenthood before they have finished schooling. In addition, attending school, university, or vocational training programs is associated with a high degree of economic dependence on parents or the welfare state (Blossfeld & Jaenichen, 1992; Blossfeld & Nuthmann, 1989). Women enrolled in full-time education may therefore consider themselves not ready for marriage and motherhood. Thus, the completion of education is expected to count as an important prerequisite for entering into parenthood. This norm did always exist for men as providers, but has also been increasingly important for women as costs of dropping out of school have risen sharply with their increasing labour force participation later in the life course (Oppenheimer, 1988). Hence, our second hypothesis is that young women will try to avoid the violation of the normative sequence of finishing school and

then entering into motherhood and, therefore, only a small proportion of women will have their first child when still enrolled in education.

Due to educational expansion, younger cohorts of women participate increasingly longer in full-time education. However, in society there exist collective expectations about the age of major life events (Neugarten, Moore & Lowe, 1965). These age norms provide also a time table for the transition to having a first child (Elder, 1975; Settersten & Mayer, 1997). Individuals are aware of both, the social clock and their own clock compared to others. So they can describe themselves as early, late or on time with regard to entry into motherhood. These expectations are also loosely linked to medical studies showing that the greatest socio-biologic disadvantages are connected with having a first child too early or too late. Age norms, like all norms, are supported by societal institutions and specify the right age for a woman when to marry and have a first child. The expectations about the appropriate age to have the first child have been different in East and West Germany, because women in the former GDR have generally become mothers at younger ages. This younger age distribution is connected to specific institutional arrangements and pronatalist family policies as we will discuss in detail below. For example, the mean age of women giving birth to a first child in 1989 has been 22.9 years in the former GDR and 26.9 years in the FRG (Federal Bureau of Statistics, 2012).

Although, the social norms about when women should have their first child might change with educational expansion, there still is an increasing conflict between longer educational participation and the appropriate timing of motherhood. So, if young women postpone motherhood because they are still enrolled in education, there is an increasing risk for violating the normative timing of motherhood. Some female students may consider the violation of the sequence of finishing education before entering into motherhood as less undesirable than the violation of the normative timing of motherhood (Yamaguchi,

1991). Therefore, we formulate a third hypothesis: Women who are enrolled in education should enter motherhood more often as age increases, since it is increasingly appropriate to have a first child.

6.1.3 New Home Economics

According to the economic theory of the family, men and women in modern societies are still characterized by a gender-specific division of work in the family and a sex-specific segregation in the labour market. This seems to be true in East and West Germany. Within couples, it is typically the mother's time which is the major part of the total cost of child care and rearing children. Women's value of time increases with investments in education and income opportunities. This immediately affects the relative costs of children (opportunity costs). Becker (1981) argues that "a growth in the earning power of women raises […] the relative cost of children and thereby reduces the demand for children" (Becker, 1981: 245-247). Better educated women, who are already working, have higher opportunity costs and will therefore postpone or even avoid motherhood. However, if women are still in full-time education they will not face any immediate income loss yet. So their relative costs of children should be quite similar for women with different educational attainment levels. Therefore, our fourth hypothesis is, if we control for age, that there should be only a small or even no effect of educational attainment level on entry into motherhood as long as these women are still enrolled full-time in education.

6.1.4 Social Background

Social origin is an important individual resource that influences not only women's educational attainment level but also the norms regarding the sequence and the timing of life course events (Marini, 1985; Blossfeld & Jaenichen, 1992) (principle of linked lives, see Chapter 1.3). It is well known, that families want to maintain their class position from one generation to the next. They therefore want that their children reach an educational level

that will allow them to attain a class position at least as good as that of their family of origin (Boudon, 1974, Breen & Goldthorpe, 1997).

Parents with a higher educational attainment level will therefore push their children to higher educational attainments. Yet, higher educational attainment means longer educational participation over the life course. For women from higher social origins, this means that they want to avoid the disrupting conflict between motherhood and educational participation and they will therefore be less likely to enter motherhood while in education. Our fifth hypothesis is, if we control for age, that women from higher social origins should be less likely to enter motherhood during educational participation.

6.1.5 The Two Germanies Before and After Unification

As mentioned above, the former German Democratic Republic (GDR) and the Federal Republic of Germany (FRG) share the same history before and after the German division (Dahlerup, 1994) (principle of place and time, see Chapter 1.3). During the 40 years of separation in Germany until 1990, both parts of Germany differed markedly in their political systems and policies. For our analysis, it is particularly important that since the 1970s there were pronatalist family and housing policies aiming to ease women's conflict between educational participation and fertility in the GDR (Cornelius, 1990; Dorbitz & Fleuschhacker, 1995; Gysi & Speigner, 1983; Huinink, 1997; Nave-Herz, 2005). For example, the GDR provided extensive support for unwed mothers and married couples in education in terms of favoured housing access, advantages with regard to the organization of the study at the university, free childcare as well as financial benefits and advantages as a couple when leaving university (Huinink & Wagner, 1995; Trappe, 1996). In particular, there was almost universal access to daylong childcare for students, who are dependent on flexible care facilities. Together, these policies therefore supported women so that they could have their children in their early twenties.

In contrast to the GDR, the FRG always considered childcare predominantly a private matter, based on the traditional model of the male breadwinner and the female homemaker. Particularly, there was no special state support for young mothers participating in education. They were basically left on their own. Implicitly, these FRG policies and institutional settings favoured the sequence of finishing education before having a first child when women did not want to be dependent on the support of their family and the state.

Of course, the policy differences between the GDR and FRG are supposed to have an impact on women's life courses since they influence the way educational participation and family roles can be combined. As discussed above, educational activities and family roles are inherently in a time conflict, since acquiring education is a time-consuming activity that tends to be incompatible with equally time-consuming family related activities (Marini, 1985). Full-time students often have rigid and structured school and university timetables and they have to pass lots of examinations. This leads to time constraints that are difficult to reconcile with individual child care and child supervision (BMFSFJ, 2012). Comparing East and West Germany, qualitative studies suggest that the pronatalist policies that supported women in education of the GDR have weakened the sequencing norm in East Germany before German unification (Bernardi, Keim & Von der Lippe, 2007, Mayer & Schulze, 2009). Our sixth hypothesis therefore is that up to German unification, more East German women will have their first child in full-time education.

Immediately after the German unification in 1990, the socio-political structure has changed in both Germanies but much more drastically for the East German part. During the process of German unification, East Germany adopted not only the West German law and its currency, but also the whole political and institutional structures. In other words, the pronatalist policies of the GDR disappeared abruptly. In the Eastern part of Germany, this has suddenly increased the conflict between educational participation and mother-

hood for young women. Mothers in education lost their privileged access to housing, have increasing difficulties to get daylong childcare, in particular without any co-payments, and are missing former financial benefits. In our difference-in-differences analysis, we therefore expect in our seventh hypothesis that West German women in education are less affected by the process of unification than their East German counterparts. We particularly assume that the rate of having a child in full-time education will drop drastically in East Germany. In other words, a difference-in-differences analysis is a quasi-experimental approach which allows the measurement of the effect of a treatment in a given period of time. In our case, the treatment is the German unification. On the one hand, there are the East German women in the former GDR who experienced conditions quite favourable to giving birth while in full-time education (housing, financial support, child care facilities etc.). And there are the East German women after German unification who did not experience such favourable circumstances anymore. So, East German women in education can serve as a kind of experimental group. On the other hand, West German women in education can serve as a kind of control group for whom the conditions did not change much through unification.

6.2 Definition of Variables

Dependent variables. In this chapter, we run two separate multivariate analyses with two different dependent variables. First, we analyse entry into first motherhood of women who are enrolled full-time in education. For our analysis, we define for each woman a spell starting at age 16. Since it is not the date of birth which is theoretically important but the timing of pregnancy, we are using in our analysis the time of conception leading to the first birth during educational participation as the event terminating a woman's spell. Furthermore, our data contains no information on pregnancies ending in miscarriage or abortion, our analyses are limited to conceptions taken from reported births. Based on the

NEPS data (see Section 1.4: 41 pp), the time of conception is defined as date of child birth minus nine months. The spells are right censored when women leave the educational system without getting pregnant or when women were interviewed before they have left the educational system.

In our second multivariate analysis, we analyse entry into first motherhood of *all women* – independent of whether or not a woman is enrolled in education, to be able to controll, whether findings of the first multivariate analysis are connected to the German unification and therefore affect all women or the specific policy change in support of women enrolled in education in the transition from GDR to the united Germany. For our analysis, we define for each woman a spell starting at age 16. Again, we are using the time of conception leading to a first birth as the event terminating a woman's spell. Right censoring happens when women turn older than 30 years without getting pregnant or when women were interviewed before they were 30 years old.

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

(1) *Age dependency (time-dependent covariate).* The rate of entry into first birth is generally considered to have a non-monotonic age pattern in modern societies (e.g. Blossfeld, 1995; Coale, 1971). As women's age increases, the rate of entry into motherhood initially rises, reaches a peak, and then declines. To control for monotonic or non-monotonic shapes of entry into first birth across age, we include two variables, age and age^2, which allow to flexibly test these baseline shapes (Blossfeld & Huinink, 1991).

(2) *Women's Educational investments (time-dependent covariate).* Differences in fertility behaviour of women have often been attributed to women's educational investments. We model women's educational investments as a time-dependent

covariate: each time when a woman attains a higher level of education, the educational attainment level will be adjusted. We distinguish nine educational attainment levels and express each degree as the number of years necessary to achieve it (see Blossfeld, Rohwer & Golsch, 2007): 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 university of applied sciences degree is equivalent to 17 years; and a university degree is equivalent to 19 years.

(3) *Father's educational attainment (time-constant covariate).* To model father's highest educational attainment, we distinguish seven educational degrees and attach the number of years necessary to achieve these degrees (see Blossfeld et al., 2007). We expect that father's educational attainment has a negative impact on women's rate of entry into motherhood during educational enrolment if we control for age.

(4) *Historical periods (time-dependent covariates) and German unification.* In the context of our difference-in-differences analysis, we are using two dummy variables to distinguish between East and West German women and the historical periods before and after German unification. We use the place of birth to identify East German women. Up to the time of German unification in 1990, the place of birth was basically identical to the East and West German region of upbringing. Immediately after the fall of the Wall, there were two years of extensive East-West migration (Schulz, 2000). After that, the East-West migration decreased strongly. After the German unification, it is very likely that the place of birth is also the

place of upbringing in early childhood, since the mobility of families with small children within Germany was limited. Mainly single adults and male breadwinners moved or commuted between East and West Germany after unification.To distinguish the periods before and after unification in our analysis, we use the dummy variable 'Period from 1990' (ref.: 'Period until 1990'). Finally, we include the interaction term 'East*Period from 1990' to estimate the effect of the 'German unification' on East German women participating in full-time education.

(5) *Marital status (time-dependent covariate).* We include the time-dependent dummy variable 'Married' to identify married women (ref.: not married) in our model as well as an interaction term for 'East*Married'.

(6) *Women's educational participation (time-dependent covariate).* In our analysis, we include a time-dependent dummy variable that has the value one, if a woman is enrolled in full-time education and zero otherwise. Additionally, we include a first order interaction term 'East*Enrolled in education' as well as a second order interaction term 'East*Enrolled in education*Period from 1990.'

6.3 Results

6.3.1 Descriptive Overview

Table 6-1 shows women in East and West Germany who have given birth to a child when still participating in education. It reveals that in absolute numbers 113 women from East and 118 women from West Germany have given birth to a first child during full-time education in our dataset. The absolute number of events in East and West Germany is surprisingly similar. However, one has to take into account, that the number of women at risk is much greater in West Germany (4,073) than in East Germany (1,038). Thus, almost 10 per cent of women in East Germany have given birth to a child during educational enrolment, whereas it is only three per cent in West Germany. In other words, the rate

Table 6-1: Women who had their first child during full-time education in East and West Germany

Place of birth	No child	Child	Total
East Germany	1,038	113	1,151
	90.18	9.82	100.00
West Germany	4,073	118	4,191
	97.18	2.82	100.00
Total	5,111	231	5,342
	95.68	4.32	100.00

Source: Estimations based on NEPS data from the adult study

of women who have got a first child in full-time education is more than three times higher in East Germany than in West Germany. In Table 6-1, it is also clear that there is a strong sequencing norm, since the huge majority of women (90 per cent in East and 97 per cent in West Germany) postpone entry into motherhood until they have left the educational system.

In Table 6-2, it is easy to see that it is mainly women with a high educational attainment level who are more likely to give birth to a child when enrolled in education. If we look at Germany as a whole, we see that 14.6 per cent of women with a university of applied sciences degree and 18.3 per cent of women with university degree have got their first babies in school. In contrast, only two to five per cent of women with lower educational qualifications have got their first child in school. This is not surprising, since women with a higher educational attainment level participate longer in education. As their age rises in the educational system, they are getting increasingly ready to enter motherhood because they are getting closer to the appropriate age to have a first child (hypothesis three). In other words, with increasing age there is a growing conflict between normative sequencing and normative timing of events for women in education.

If we compare women in East and West Germany in Table 6-2, it is again clear, that East German women get their first child more often in school across all educational attainment levels. However, the differences between East and West are obviously growing

as women reach higher educational attainment levels. In Table 6-2, we can see that almost 29 per cent of women with university degree and about 19 per cent of women with Abitur and vocational training or a degree of a university of applied sciences have got their first babies in full-time education in East Germany. In West Germany, the respective per centages are much lower (10 per cent for women with university degree, 10 per cent for women who graduated from universities of applied sciences and about three per cent for women with Abitur and vocational training). It seems that women's conflict between educational participation and fertility is much lower in East than in West Germany (hypothesis one). However, it is still unclear, whether this difference is connected to the special conditions in East and West Germany before German unification.

Table 6-3 addresses this unification issue by comparing women in East and West Germany who have left the educational system before the German unification with East and West German women who have not yet completed their educational career at time of unification or who started their career after German unification. Indeed, Table 6-3 demonstrates that the differences between East and West German women are particularly strong before German unification. Across the three broader educational attainment levels (low, medium and high) East German women get their first child in school much more often before unification. The differences between East and West are again growing as women reach higher educational attainment levels in the period before German unification. This suggests that the pronatalist family policies in the former GDR were successful in reducing the conflict between educational participation and motherhood for young women and therefore pushed the fertility rate in the GDR (hypothesis six). This conclusion is also supported by a comparison of the behaviour of East German women before and after German unification. The abolition of pronatalist measures supporting mothers in full-time education in the course of German unification resulted in a declining fertility of women in education after unification in East Germany. Interestingly, also for West

Table 6-2: Women who had their first child during full-time education by highest educational attainment level in East and West Germany

Educational Attainment level	East Germany			West Germany			Whole of Germany		
	No child	**Child**	**Total**	**No child**	**Child**	**Total**	**No child**	**Child**	**Total**
No degree	59	2	61	210	7	217	269	9	278
	96.72	3.28	100.00	96.77	3.23	100.00	96.76	3.24	100.00
Lower secondary school qualification without vocational training	68	2	70	470	11	481	538	13	551
	97.14	2.86	100.00	97.71	2.29	100.00	97.64	2.36	100.00
Middle school qualification without vocational training	282	20	302	993	26	1,019	1,275	46	1,321
	93.38	6.62	100.00	97.45	2.55	100.00	96.52	3.48	100.00
Lower secondary school qualification with vocational training	50	6	56	368	15	383	418	21	439
	89.29	10.71	100.00	96.08	3.92	100.00	95.22	4.78	100.00
Middle school qualification with vocational training	345	50	395	730	32	762	1,075	82	1,157
	87.34	12.66	100.00	95.80	4.20	100.00	92.91	7.09	100.00
Abitur	134	10	144	1,023	11	1,034	1,157	21	1,178
	93.06	6.94	100.00	98.94	1.06	100.00	98.22	1.78	100.00
Abitur with vocational training	47	4	51	188	5	193	235	9	244
	92.16	18.75	100.00	97.41	2.59	100.00	96.31	3.69	100.00
University of applied sciences degree	13	3	16	28	4	32	41	7	48
	81.25	18.75	100.00	87.50	10.00	100.00	85.42	14.58	100.00
University degree	40	16	56	63	7	70	103	23	126
	71.43	28.57	100.00	90.00	10.00	100.00	81.75	18.25	100.00
Total	1,038	113	1,151	4,073	118	4,191	5,111	231	5,342
	90.18	9.82	100.00	97.18	2.82	100.00	95.68	4.32	100.00

Source: Estimations based on NEPS data from the adult study

Table 6-3: Women who had their first child during full-time education before and after the German Unification by highest educational attainment level in East and West Germany

	Low educational attainment level[a]			Medium educational attainment level[b]			High educational attainment level[c]		
	No child	**Child**	**Total**	**No child**	**Child**	**Total**	**No child**	**Child**	**Total**
Before Unification									
East Germany	92	3	95	88.95	81	733	38	18	56
	96.84	3.16	100.00	88.95	11.05	100.00	67.86	32.14	100.00
West Germany	524	10	534	2,531	75	2,606	49	10	59
	98.13	1.87	100.00	97.12	2.88	100.00	83.05	16.95	100.00
Total	616	13	629	3,183	156	3,339	87	28	115
	97.93	2.07	100.00	95.33	4.67	100.00	75.65	24.35	100.00
After Unification									
East Germany	35	1	36	206	9	215	15	1	16
	97.22	2.78	100.00	95.81	4.19	100.00	93.75	6.25	100.00
West Germany	156	8	164	771	14	785	42	1	43
	95.12	4.88	100.00	98.22	1.78	100.00	97.67	2.33	100.00
Total	191	9	200	977	23	1,000	57	2	59
	95.50	4.50	100.00	97.70	2.30	100.00	96.61	3.39	100.00

[a] Low educational attainment level: No degree, Lower secondary school qualification without vocational training.
[b] Medium educational attainment level: Middle school qualification without vocational training, lower secondary school qualification with vocational training, middle school qualification with vocational training, Abitur, Abitur with vocational training.
[c] High educational attainment level: University of applied sciences degree, University degree.
Source: Estimations based on NEPS data from the adult study

German women with high educational attainment level, there is a decline in the fertility rate of women in full-time education. At this point of the analysis, it is however unclear whether the effect of German unification on the fertility rate of women in full-time education is a genuine effect or the result of compositional constellations.

6.3.2 Model Estimation

Using methods of discrete-time event history analysis (see Section 1.5: 47pp), we conduct a difference-in-differences longitudinal study. Therefore, we follow up women enrolled in full-time education from age 16 until the event of a conception leading to the birth of a first child.

In Model 1 of Table 6-4 we include age as a second degree polynomial. Our results clearly show that there is a first increasing and then decreasing age pattern as both variables age and age^2 are significant and have opposite signs. Women who are enrolled in education enter motherhood more often as age rises, since it is increasingly appropriate to have a first child, although with a declining slope (hypothesis three). This shows the increasing importance of normative timing.

In Model 2 of Table 6-4 we add women's educational attainment level as a time-dependent explanatory variable. This time-dependent educational attainment level variable increases for each woman step-by-step over the educational career. Contrary to our expectations, educational attainment level has no significant additional effect (hypothesis four). This signals that women's readiness to enter motherhood in full-time education does not differ by educational attainment level or human capital investments but is simply dependent only on age.

In Model 3 of Table 6-4, we include women's social origin as an explanatory variable. The results show a significantly negative effect. Families want to maintain their class

Table 6-4: Covariate effects on the rate of entry into first motherhood for women in full-time education

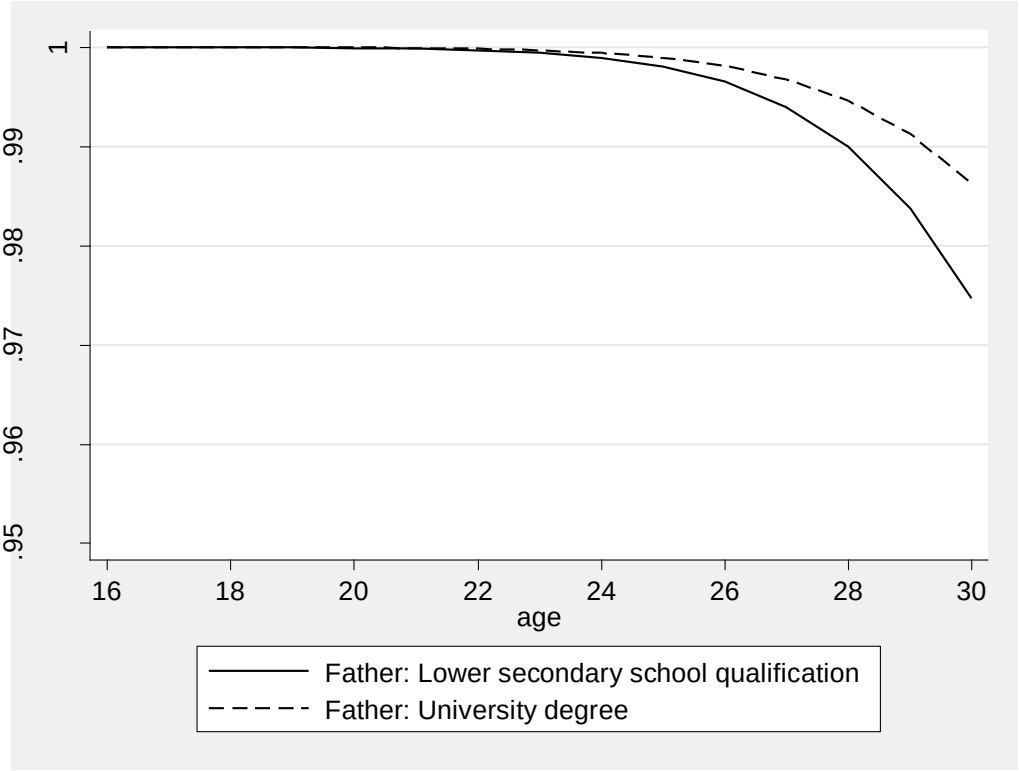
Variables	**Model**					
	1	**2**	**3**	**4**	**5**	**6**
Age dependency (time-dependent covariate)						
Age	1.137***	1.283***	1.368***	1.462***	1.544***	1.544***
Age^2	-0.015***	-0.016***	-0.017***	-0.018***	-0.019***	-0.019***
Education (time-dependent covariate)						
Woman's educational attainment level		-0.002	-0.003	-0.010	-0.011	-0.011
Social background (time-constant covariate)						
Father's educational attainment level			-0.069*	-0.079**	-0.073**	-0.072**
Place of birth (time-constant covariate)						
West Germany (ref.)						
East Germany				1.318***	1.695***	1.701***
Historical Period (time-dependent covariate)						
Period until 1990 (ref.)						
Period from 1991					-0.127**	-0.127**
East*Period from 1991					-0.986***	-0.986***
Marital state (time-dependent covariate)						
Not married (ref.)						
Married						0.030
East*Married						0.011
Intercept	-14.883***	-14.426***	-31.918***	-33.865***	-35.561***	-33.693***
Number of events	231	231	231	231	231	231
Number of sub-episodes	637,235	637,235	637,235	637,235	637,235	637,235
Chi^2	342.74	345.98	576.18	650.68	670.85	661.56
Degrees of freedom	1	2	4	5	7	9

Note: *p<0.05; *p<0.01; ***p>0.001
Source: Estimations based on NEPS data from the adult study

position from one generation to the next. To avoid the jeopardizing consequences of motherhood on educational success, families from higher social origins have a stronger desire that women should first finish education before they have their first child. In Figure 6.1, we illustrate the effect of age and social origin on the fertility behaviour of women in education. We simulate the survivor functions for women who have not yet become mothers by father's educational attainment level based on the estimations of Model 3. With increasing age the percentages of women in education who become mothers increases. This increase is, however, lower for women who come from families where fathers have higher educational attainment levels (hypothesis five).

With Model 4 of Table 6-4 we start our difference-in-differences analysis. We first add a dummy variable for East Germany. The positive effect of this covariate shows that, compared to West German women, women in East Germany have their first babies much more often while in full-time education. In Model 5 we add a dummy variable for the

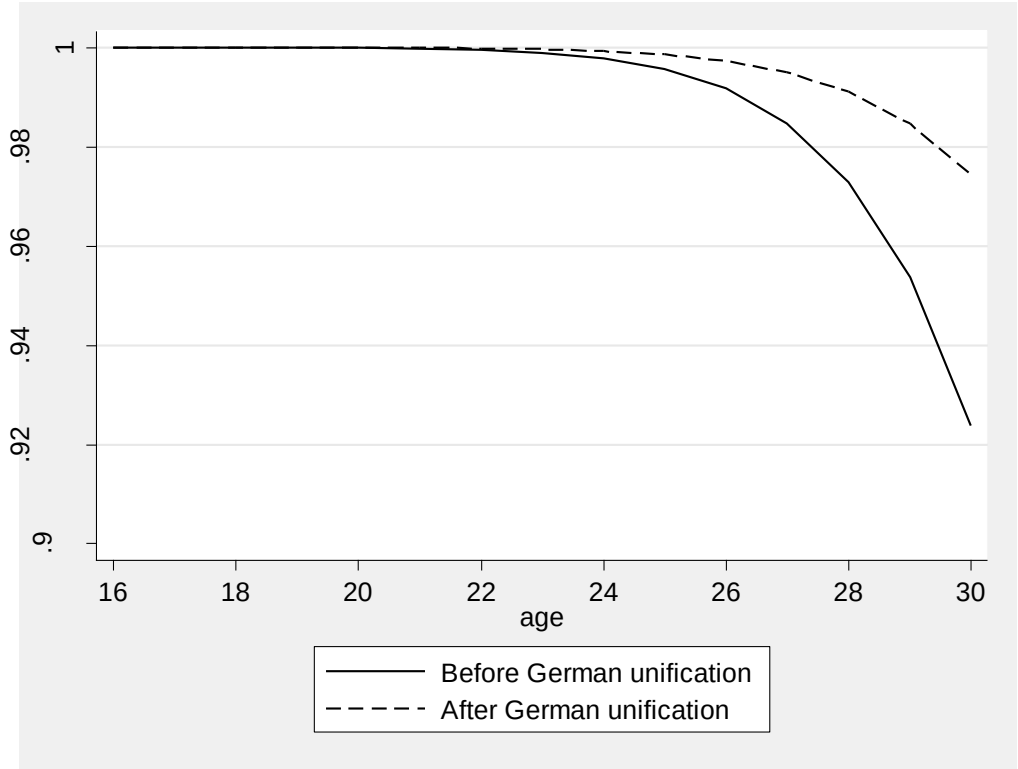
Figure 6.1: Plot of women in education who have not yet become mothers by father's educational attainment level (survivor functions)



Source: Estimations based on NEPS data from the adult study

historical period after German unification and an interaction term 'East*Period after unification'. Both coefficients are – as expected - significantly negative. This indicates that in the unified Germany, women have reduced the entry into motherhood while in full-time education. The effect 'East*Period after unification' suggests that the abolition of GDR pronatalist measures supporting mothers in full-time education resulted in a declining fertility of women in education after unification particularly in East Germany (hypotheses six and seven). Put another way, our analysis suggests that in the GDR the pronatalist family and housing policies for mothers in education in terms of favoured housing access, free childcare as well as financial benefits were successful and increased women's fertility. In Figure 6.2, we estimate and illustrate the survivor functions for women who have not yet become mothers before and after German unification. We focus on women

Figure 6.2: Plot of East German women in education who have not yet become mothers before and after German unification (survivor functions of women with fathers who have attained middle school qualification and vocational training)



Source: Estimations based on NEPS data from the adult study

with fathers who have attained middle school qualification and vocational training based on the estimations of Model 5. With increasing age the percentages of women in education who become mothers increase. This increase is, however, much lower for women who were enrolled in education after German unification.

In Model 6 of Table 6-4, we introduce woman's marital status into our analysis. The main coefficient and its interaction term with East Germany are both not statistically significant. Expressed differently, women's decision to enter motherhood during full-time educational participation is not influenced by women's marital state.

However, it is not clear yet to which extend the outcome of the difference-in-differences model represents a general change in society connected with German unification or the

Table 6-5: Covariate Effects on the rate of entry into first motherhood for all women up to the age of 30 years

Variables	**Model 1**
Age dependency (time-dependent covariate)	
Age	0.654***
Age^2	-0.011***
Educational participation (time-dependent covariate)	
Not enrolled in education (ref.)	
Enrolled in Education	-1.273***
Place of birth (time-constant covariate)	
West Germany (ref.)	
East Germany	0.847***
Historic Period (time-dependent covariate)	
Period until 1990 (ref.)	
Period from 1991	-0.281***
Interaction terms (time-dependent covariates)	
East*Period from 1991	-0.432***
East*Enrolled in Education	0.701***
East*Period from 1991*Enrolled in Education	-0.518***
Intercept	-13.829***
Number of events	3,195
Number of sub-episodes	904,222
Chi^2	2242.48
Degrees of freedom	8

Note: *p<0.05; *p<0.01; ***p>0.001
Source: Estimations based on NEPS data from the adult study

specific policy change in the transition from GDR to the united Germany for woman enrolled in education. We therefore estimate an additional event history model for entry into first motherhood of all women – independent of whether or not a woman is enrolled in education. The results in Table 6-5 show several interesting findings. First, the age dependency clearly indicates that there is a first increasing and then decreasing age pattern of entry into motherhood for all women. This supports the hypothesis of age norms that women are increasingly ready to enter into motherhood up to an appropriate age. Second, the significant negative effect of the time-dependent covariate 'enrolled in education' shows that women have a much lower rate of entry into motherhood as long as they are enrolled in education. This result supports the hypothesis that there is a sequencing norm and that women try to finish schooling before entering into motherhood (hypothesis two). The positive effect of the age norm and the negative effect of the sequencing norm show that both norms are in a dynamic conflict and that they are competing with each other.

The significantly positive effect of 'East Germany' shows that East German women, even after German unification, have a lower age distribution of entry into motherhood. Thus, even after the dramatic change of the institutional context, East German women seem to have different collective expectations about the appropriate age when women should have their first child. This is strong support of the hypothesis that the biographies of individuals do not change immediately with institutional settings, but that institutional settings have a long-lasting impact on biographies.

The interaction term 'East*Period from 1990' shows that the German unification has led to a decrease of entry into motherhood for all women – whether or not they are enrolled in education. This represents the general effect of German unification on the fertility behaviour of all East German women. The significantly positive effect for 'East*Enrolled in education' shows that East German women, indeed, had a higher fertili-

ty when they were enrolled in education. However, the second order interaction effect 'East*Period from 1990*Enrolled in Education' suggests that there is an effect of the specific policy change in the course of German unification affecting women enrolled in education. Mothers in education abruptly lost their privileged access to housing, have increasing difficulties to get daylong childcare, in particular without any co-payments, and are missing former financial benefits. This reduced the rate of entry into motherhood of women enrolled in education in East Germany after unification.

Of course, our analysis is only based on observational data and we have not conducted a strict experiment testing the impact of policy intervention. So we have to be careful with policy recommendations based on this analysis. However, given the 'natural experiment' of a specific policy change in the course of German unification, the estimates of our event history models and the high external validity of our analysis, there seems to be some justification for the recommendation to increase fertility of women in modern Germany through pronatalist policy measures.

6.4 Summary of Empirical Findings

This chapter has empirically studied the factors influencing the fertility behaviour of women enrolled in full-time education. Our descriptive and multivariate analyses show that in Germany the rate of becoming a mother in full-time education is strongly influenced by two competing societal norms: First, a normative sequencing norm that women should first finish education before they have their first child (hypothesis two). The huge majority of women (90 per cent in East and 97 per cent in West Germany) postpone entry into motherhood until they have left the educational system. Second an age norm, representing societal expectations about the appropriate age to start having children (hypothesis three). If more and more young women postpone motherhood because they are enrolled in education, the risk of violating the normative timing of motherhood is also in-

creasing. It is particularly women from lower social origin who violate the sequencing norm and enter into motherhood before finishing education.

Using longitudinal data from the National Educational Panel Study (NEPS), we have conducted a difference-in-differences analysis to study the effects of changing state support for mothers in education before and after unification in East Germany and to compare these developments with changes in West Germany. Our longitudinal analysis demonstrated that the conflict between the sequencing norm and the age norm is dependent on women's age, social origin, and pronatalist state support for women in full-time education. Women who are enrolled in education enter motherhood more often as age increases, since the pressure coming from the normative timing of motherhood is increasing, although with a declining slope. Women's own educational attainment level has no significant effect on women's entry into motherhood (hypothesis four). On the other hand, social origin has a significantly negative effect which can be explained as follows: Women from higher social origin want to maintain their class position from one generation to the next. Thus, they don't want to risk their educational success through entry into motherhood. Therefore, these women have a stronger desire to first finish education before they have their first child (hypothesis five). Additionally, our analysis shows that marriage has no effect on women's entry into motherhood during educational participation.

The results of our analysis also demonstrate that the fertility behaviour of young women who are enrolled in full-time education has changed with German unification. In the FRG, there has been no special state support for young mothers participating in education because the conservative welfare state considers children and child care predominantly a private matter. In the GDR, comprehensive pronatalist family and housing policies were introduced supporting especially women in full-time education through favoured housing

access, free childcare as well as financial benefits. The sudden end of these policies after unification has led to a massive increase in the conflict between educational participation and motherhood in the Eastern part of Germany. It resulted in a declining fertility of women in education after unification (hypothesis six and seven). In other words, our analysis suggests that in the GDR the pronatalist family and housing policies for mothers in education were successful and increased women's fertility.

Our analysis is not based on an experimental design testing policy interventions. It is only based on a 'natural experiment' and observational data, so we have to be careful with policy recommendations based on this analysis. However, our analysis suggests the following two policy recommendations: First, Germany should introduce comprehensive measures supporting mothers in full-time education to reduce the conflict between educational participation and motherhood. This is likely to increase fertility as was demonstrated by the GDR. Second, one should be careful not to introduce too much of an incentive to push women in full-time education into motherhood because acquiring education is a time-consuming activity that tends to be incompatible with equally time-consuming family related activities.

6.5 References

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7 How Does Women's Educational Enrolment, Educational Attainment Level, Labour Force Participation and Career Advancement Affect the Rate of Entry into First Motherhood?

In recent decades, women's education and job careers have improved impressively in East and West Germany. Higher educational attainment of women across cohorts means increasingly longer educational participation over the life course from one cohort to the next. In terms of educational attainment level, women have experienced unprecedented gains (Authoring Group Bildungsberichterstattung, 2010; 2012; 2014; Huinink & Wagner, 1995). With increasing educational investments, women's labour force participation over the life course has strongly risen and they are also more and more able to turn their educational investments into career gains. Life course studies from the 1980s have shown that these changes in education and job careers were consequential for entry into first motherhood in West Germany (Blossfeld, 1995, Blossfeld & Huinink, 1991, Brüderl & Klein, 1993, Olbrich & Brüderl, 1995). It often leads to a postponement of first motherhood (timing effect) (Blossfeld & Blossfeld, 2014, Skirbekk, Kohler & Prskawetz, 2004) or even to decisions to have no baby at all (declining fertility), if women find it difficult to reconcile job and family roles (Becker, 1981).

There are many life course studies analysing the changing relationships between education, jobs and fertility. However, there is no study which examines the impact of educational enrolment, educational attainment level, labour force participation and career advancement on women's decision to have a first child for the most recent cohorts (life span development & timing of events and transitions, see Chapter 1.3). In particular, it is unclear to which extend these patterns for the younger generations of women today are still similar to the patterns of women found in life course studies 20 or 30 years ago (principle of place and time, see Chapter 1.3). What is also missing is an analysis of these relationships in East and West Germany before and after German unification. Using brand new life course data from the 'National Educational Panel Study' (NEPS), we focus on entry

into first motherhood of women in East and West Germany. The aim of the chapter is to study both, the long-term changes and most recent developments of women's education, labour market participation and entry into first motherhood. The NEPS data is particularly useful for an analysis of the impact of the German unification on entry into first motherhood in East and West Germany, since it offers longitudinal data from successive birth cohorts born between 1944 and 1986. In particular, it allows an analysis of the effects of the changing institutional contexts before and after unification in East Germany and to compare these developments with trends in West Germany.

In this chapter, we first discuss several theoretical approaches and formulate testable hypotheses. We then report the results of the longitudinal analysis. The chapter concludes with a summary of the results and draws some more general conclusions regarding relevant theories.

7.1 Theoretical Framework and Hypotheses

7.1.1 Life Course Approach: Normative Sequencing of Events and Fertility Pressure

Life course research has studied the normative sequencing of life course events (Hogan, 1978). A study by Hogan (1978) indicates that a normative sequence between finishing education, entering the job market and entry into motherhood exists because there are general societal norms about these events, economic issues of independence and time conflicts between different roles (timing of events and transitions, see Chapter 1.3). As a result of these factors, individuals move from schooling to work and then to marriage as well as parenthood. In order to satisfy their sequencing norm, young adults will be less likely to enter parenthood before they have finished schooling. Women enrolled in education may therefore consider themselves not ready for marriage and motherhood (see our results in the previous chapters). Thus, the completion of education is expected to count as an important prerequisite for entering into parenthood (Blossfeld & Jaenichen, 1992).

This norm has not only been very important for men, but has become increasingly relevant for women across cohorts as costs of dropping out of school have risen sharply with their increasing labour force participation (Oppenheimer, 1988). Hence, our first hypothesis is that young women will try to avoid the violation of the normative sequence of school and then motherhood and therefore postpone entry into motherhood until they have completed education (postponement hypothesis).

If women want to have children and postpone the first birth, they are getting increasingly under fertility pressure. Since women are only in their fertile years until they are about 45, the period in which these women can get their first child is getting shorter and shorter. Therefore, we formulate a second hypothesis: With increasing age, we expect that childless women will enter into first motherhood quicker (fertility pressure hypothesis).

7.1.2 Economic Perspectives: Investments and Employment Forms

According to the economic theory of the family, men and women in modern societies are characterized by a gender-specific division of work in the family and a sex-specific segregation in the labour market. This still seems to be true in East and West Germany (Steinmetz, 2013). Within couples, it is therefore typically the mother's time which is the major part of the total cost of child care and rearing children in Germany. Women's value of time increases with investments in educational attainment and career resources leading to income opportunities (life span development, see Chapter 1.3). This immediately affects the relative costs of children (opportunity costs). Becker contends that "a growth in the earning power of women raises […] the relative cost of children and thereby reduces the demand for children" (Becker, 1981: 245-247). In contrast, Strohmeyer (1993) and Huinink (1995) argue that highly educated West German women tend to either have no children or to have two or more. In other words, one group of highly educated women focuses on their career and stay childless, while the other group of women focuses on the

family. According to Huinink, this phenomenon should not extend to the less educated women. Hence, we formulate a third hypothesis: There should be a negative effect of women's educational attainment level and career resources on the rate of entry into first motherhood (opportunity cost hypothesis).

However, not all women are able to turn their human capital investments into career resources, because they do not work or do not find a job. We therefore formulate a fourth hypothesis, that women who are unemployed or not employed will be entering first motherhood more often than employed women (non-employment hypothesis).

Regarding the forms of women's employment we also have to distinguish between part-time and full-time employment as well as temporary and permanent labour contracts because they are likely to have a different impact on entry into first motherhood. Women who work part-time have lower opportunity costs than women who work full-time since these women normally have lower incomes. In addition, it is easier to combine childcare and labour market participation if women work part-time, since in Germany public childcare is often offered in the mornings so that these women can take care of their children in the afternoon. Furthermore, women who work part-time or are unemployed might have limited labour market opportunities or are discriminated on the labour market. Friedman, Hechter and Kanazawa (1994) contend "that uncertainty reducation is a universal immanent value" (Friedman et al., 1994: 382) and the failure to achieve a desired end (such as permanent full-time employment) can increase women's wish for an alterntive role within society e.g. motherhood. Having a child can change these women's life from uncertain to relatively certain, since their "life's script is suddenly written for [them] to 90 percent" (Campbell, 1968: 238). Therefore, we expect in our fifth hypothesis, that women who work part-time will enter first motherhood more often since they are facing a lower conflict between childcare and labour market participation (part-time hypothesis) and might

search for an alternative explanation for their unachieved desire to be employed (calue of children hypothesis). On the other hand, women with a permanent contract are more likely to enter first motherhood than women with temporary contracts since women with a fixed-term contract have higher job insecurity and do not want to endanger their employment opportunities through pregnancy and motherhood. Our sixth hypothesis is therefore that women who have fixed-term employment contracts will enter first motherhood less often (fixed-term hypothesis).

7.1.3 The Two Germanies Before and After Unification

The former German Democratic Republic (GDR) and the Federal Republic of Germany (FRG) share the same history before and after the German division (Dahlerup, 1994) (principle of place and time, see Chapter 1.3). During the 40 years of division in Germany until 1990, both parts of Germany differed markedly in their political systems and policies. For our analysis, it is particularly important that in the socialist GDR women were completely integrated into the labour market, based on secure, permanent, full-time work. In addition, the socialist right to work and the inefficient economy produced a labour market where unemployment was literally non-existent (Nave-Herz, 2004) (see Figure 1.7 on page 43).

Thus, women with children in the GDR were dependent on state support because of the norm that all women, including mothers, should work full-time outside the home. Free daylong childcare was assigned to the public domain (Kolinsky, 1992; Rosenberg, 1991). To support mothers, the GDR also introduced extensive pronatalist policies. These measures supported mothers in terms of extensive parental leave as well as financial benefits (Huinink & Wagner, 1995; Trappe, 1995; 1996). For example, the extensive parental leave of one year is connected to a guaranteed right to return to the pre-interruption employer. Yet, in Table 7-1, the duration of legal regulation of parental leave have been

Table 7-1: Overview of the legal regulation of parental leave in the GDR, the FRG and the whole of Germany

Date	Name	Duration of satutory parental leave with job guarantee (month)	Duration of maternity/paternity benefit (month)
1952	Maternity leave	2 (14 weeks)	2 (14 weeks)
1976	Maternity leave*	6 (26 weeks)	6 (26 weeks)
1976	Baby year *	12	12
1984	Baby year for mothers with 3 or more children*	18	18
7/1979-12/1985	Maternal leave	6	6
1/1986-12/1990	Baby year*	12	12
1/1986-12/1991	Parental leave	12-18	12-18
1/1992-12/2001	Parental leave	36	24/36 (depending on the federal state
1/2001-12/2007	Reformed parental leave	36	12/24 (choice)
1/2007	Parental allowance	36	12, earnings related

*regulation in the GDR
Source: Bird (2003), Gottschall & Bird (2003), Kreyenfeld (2001), Trappe (1995), Winkler (1989)

quite similar in the GDR, FRG and the united Germany. The main difference between the GDR and the FRG was the guaranteed right to return to a job in the GDR with compensation of the forgone earnings. In contrast to the GDR, the FRG always considered childcare predominantly a private matter, based on the traditional model of the male breadwinner and the female homemaker. In contrast to the GDR, where women were working full-time, many women in the FRG were not working at all and if they did, they were mainly employed as part-time workers. The state provided tax incentives for the homemaker/mother role in addition to expensive, half-day child care (Esping-Andersen, 1999; Gauthier, 1996; Sainsbury, 1997; Treas & Widmer, 2000). Children and mother's employment were incompatible and women reduced their working hours or even gave up their employment career with the birth of the first child (Kurz, 1998; Lauterbach, 1994). Family and labour market policies clearly treat women as a reserve labour force and favour "women who manage to get and remain married to a continuously employed man" (Ostner 1994: 136). Of course, the policy differences between the GDR and FRG are sup-

posed to have an impact on women's life courses since they influence the way labour market participation and family roles can be combined. Comparing East and West Germany, qualitative studies suggest that the pronatalist policies that supported women of the GDR have had an effect (Bernardi, Keim & Von der Lippe, 2007, Mayer & Schulze, 2009). Our seventh hypothesis therefore is that up to German unification, East German women have a lower proportion of childless women than West German women, due to extensive parental leave and other pronatalist measures (GDR hypothesis).

Immediately after the German unification in 1990, the socio-political structure has changed more drastically in East than in West Germany. People in the GDR were facing a sudden high level of uncertainty. As one can see in Figure 1.7 on page 43, the unemployment rate in the GDR is jumping from about zero to a level above 20 per cent after unification. In comparison, the unemployment rate in the FRG stayed at a relatively unchanged level of approximately 10 per cent at this time. Additionally, the pronatalist policies of the GDR disappeared abruptly and women in the former GDR were facing a particularly high unemployment. In the Eastern part of Germany, this cut in pronatalist policies has suddenly increased the conflict between labour market participation and motherhood for women. Mothers had increasing difficulties to get daylong childcare, in particular without any co-payments, and are missing former financial benefits and extensive family leave. To put this into numbers, in the former GDR, broad coverage of free child care was reduced from 58 per cent (in 1991) to 33 per cent (in 1996) for small children (aged 0-3) and for older children (aged 3-6) from 89 per cent (in 1991) to 85 per cent (in 1996) (Kreyenfeld, 2006). Thus, the cut through German unification has been particularly drastic for mothers with children under the age of three, and it clearly indicates that the policies of the unified Germany encourage women to care for their own children at home for the first few years. In our analysis, we therefore expect in our eighth hypothesis that West German women are less affected by the process of unification than their East Ger-

man counterparts (unification hypothesis). We particularly expect that the rate of having a child will drop drastically in East Germany after the unification, since women are facing a high level of uncertainty in all domains of their life.

7.1.4 Age Dependency, Social Origin and Marriage

The effects of educational enrolment, educational attainment level, labour force participation and career advancement on women's decision to have a first child are also affected by age dependencies (life span development, see Chapter 1.3), social origin (principle of linked lives, see Chapter 1.3) and marriage decisions (timing of events and transitions, see Chapter 1.3), which we have to control for in our longitudinal analysis.

It is well known that the rate of entry into first motherhood has a non-monotonic age pattern in modern societies (e.g. Bloom, 1982; Coale, 1971,). As women's age increases, the rate of entry into motherhood initially rises, reaches a peak, and then decreases. This bell-shaped base-line hazard rate can be explained by two competing mechanisms, (1) the readiness to enter into motherhood - which is of course influenced by participation in education and the job market, and (2) the dynamics of the marriage market – influencing the probability to meet a single partner in a specific age interval (see our analyses in Chapters Three and Five). Given the importance of this pattern over the life course for entry into motherhood, it seems reasonable to include age dependency into our models of first motherhood as a control variable. As in the previous chapters, we are using two variables: log (current age-15.9) and log (45.1-current age) in our longitudinal analysis.

In addition, we include a measure of social origin into our analysis. Social origin influences not only women's educational attainment level but also the norms regarding the sequence and the timing of life course events (Marini 1985, Blossfeld & Jaenichen, 1992). It is well known, that families want to maintain their inequality position from one generation to the next. They therefore want that their children reach an educational level

that will allow them to attain a job position at least as good as that of their family of origin (Boudon, 1974, Breen & Goldthorpe, 1997). Parents with a higher educational attainment level will therefore not only push their daughters to longer educational participations over the life course but also to higher educational attainments. To avoid the disrupting conflict between motherhood and educational participation, these families should have a stronger sequencing norm (see our results in Chapter Six). Therefore, we expect a negative impact of social origin on entry into first motherhood.

Finally, it is well known in the demographic literature, that nuptiality and fertility are closely connected (see our findings in Chapters Three to Five). Otherwise said, children are often born within marital settings and therefore entry into motherhood increases strongly after marriage. This is especially true in West Germany, since West Germany is known to be more traditional than its East German counterpart. East German women also cohabit longer and get their babies much more often out of wedlock (see our findings in Chapter Three to Five; BMFSFJ, 2010; Nave-Herz, 2004). For example, the proportion of babies born out of wedlock was 35 per cent in East Germany and 10 per cent in West Germany in the early 1990s and 61 per cent (East Germany) and 27 per cent (West Germany) in 2010 (BMFFSJ, 2010). We therefore include marital status as a control variable into our models.

7.2 Definition of Variables

Dependent variable. We analyse entry into first motherhood of women in their fertile years. The event of a child birth to a woman 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 age 16. Since it is not the date of childbirth which is theoretically important but the timing of pregnancy, we are using in our analysis the time of conception leading to the first birth as the event terminating a wom-

an's spell. Based on the NEPS data (see Section 1.4: 41 pp), the time of conception is defined as date of child birth minus nine months. For women who do not give birth to a first child until they have reached the age of 45, we censor the spells on the right. The spells are also right-censored for younger women who have not had their first child until the interview.

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

(1) *Women's educational enrolment (time-dependent covariate).* According to the life course theory, we expect a lower rate of entry into motherhood as long as women are enrolled in the educational system. In our analysis, a time-dependent dummy variable is therefore included having the value one, if a woman is enrolled in education and zero otherwise.

(2) *Fertility pressure (time-dependent covariate).* The increasing fertility pressure is modelled by including a time-dependent covariate which increases linearly from age 16 onwards.

(3) *Women's Educational investments (time-dependent covariate).* In the economic theory of the family, differences in fertility behaviour of women are attributed to women's educational investments. We model women's educational investments as a time-dependent covariate: each time when a woman attains a higher level of education, the educational attainment level will be adjusted. We distinguish nine educational attainment levels and express each degree as the average number of years necessary to achieve it (see Blossfeld, Golsch & Rohwer, 2007).

(4) *Women's career resources (time-dependent covariate).* To model women's changing career resources over the life course, we use for each job the time-

varying ISEI prestige score as a proxy measure of the goodness of job. If women are not employed, we allocate the value of zero.

(5) *Employment intensity (time-dependent covariate).* We use two time-varying dummy variables 'Part-time employed' and 'Unemployed[2]' to model the employment intensity. 'Full-time employed' (ref.) is the reference category.

(6) *Fixed-term employment (time-dependent covariate).* We include the time-varying dummy variable 'Temporary employment contract' to control for the duration of the employment contract. The reference category is 'Permanent employment contract (ref.)'.

(7) *Historical periods (time-dependent covariates) and German unification.* In the context of our analysis, we are using two dummy variables to distinguish between East and West German women and three dummy variables to distinguish between historical periods before and after German unification as well as the period after 2003. We use the place of birth to identify East German women (dummy variable 'East', West German women are the reference group). To distinguish the periods before and after unification in our analysis, we use the dummy variable 'Period between 1990 and 2003' and 'Period since 2003'. The reference category is the 'Period before 1990'. Finally, we include two interaction dummy-variables 'East*Period between 1990 and 2003' and 'East*Period since 2003' to estimate the effect of the 'German unification' on East German women.

(8) *Unemployment rate (time-dependent covariate).* To control for the influence of unemployment on entry into first motherhood, we include the time-varying macro variable 'Unemployment rate' measured separately for East and West

[2] We included women that are not working into the category of women who are unemployed, since the number of women that were not working was very low.

Germany (see Figure 1.7, p.43). We attach the annually changing unemployment rate to each of the corresponding month of the year.

(9) *Age dependency (time-dependent covariate).* To model the non-monotonic shape of entry into first birth across age, we include two variables, 'Log (current age-15.9)' and 'Log (45.1-current age)', which allow us to flexibly test different base-line age shapes.

(10) *Father's educational attainment (time-constant covariate).* To model father's highest educational attainment, we distinguish seven educational degrees. We then attach the average number of years that are necessary to achieve these degrees.

(11) *Marital status (time-dependent covariate).* We include the time-dependent dummy variable 'Marital status' into our analysis, indicating whether or not a woman is married in the respective month in our model as well as an interaction term between 'East*Marital status'.

7.3 Results

First, we present an overview of the number of women who entered into first motherhood in East and West Germany up to the time of the retrospective NEPS interview. Then we compare the numbers of first births up to the NEPS interview for women with different highest educational attainment levels. Finally, we conduct a multivariate longitudinal analysis in order to study the effects of the time-constant and time-varying covariates on entry into first motherhood.

7.3.1 Descriptive Overview

Table 7-2 shows women in East and West Germany who gave birth to a first child up to the time of the NEPS interview. It reveals that in absolute numbers 936 women from East

Table 7-2: The birth of a first child for women in east and west germany up to the time of the NEPS interview in 2009/2010

Place of birth	No child	First Child	Total
East Germany	186	936	1,122
	16.58	83.42	100.00
West Germany	1,151	3,033	4,184
	27.51	72.49	100.00
Total	1,337	3,969	5,306
	25.20	74.80	100.00

Source: Estimations based on NEPS data from the adult study

Germany and 3,033 women from West Germany have given birth to a first child in our dataset. However, one has to take into account, that the number of women at risk is much greater in West Germany (4,184) than in East Germany (1,122). Thus, almost 83 per cent of women in East Germany have given birth to a first child, whereas it is only 73 per cent in West Germany. Put differently, the rate of women who have had a first child up to the time of the NEPS interview is 10 per cent higher in East Germany than in West Germany.

In Table 7-3, it is easy to see that it is mainly women with a low educational attainment level who are more likely to give birth to a first child up to the date of the NEPS interview. We see that only about 58 per cent of women with university degree and about 66 per cent of women who graduated from universities of applied sciences have entered first motherhood. In contrast, about 85 per cent of women with lower educational qualifications have had their first child up to the time of the NEPS interview. At first glance, this suggests that a low fertility is strongly related to educational attainment level as was predicted by the economic theory of the family. However, this might be a misleading inference from a cross-sectional observation, because women with higher educational attainment levels participate longer in education and tend to postpone first motherhood. Many of the highly educated women from the younger birth cohorts might therefore get their first babies after the interview of the NEPS study and a low fertility might therefore be

Table 7-3: Women who have had a first child by highest educational attainment level in East and West Germany

Casmin	No Child	First Child	Total
No degree	5	52	57
	8.77	91.23	100.00
Lower secondary school qualification without vocational training	22	133	155
	14.19	85,81	100.00
Middle school qualification without vocational training	334	1,450	1,784
	18.72	81,28	100.00
Lower secondary school qualification with vocational training	146	712	858
	17.02	82.98	100.00
Middle school qualification with vocational training	15	247	262
	5.73	94.27	100.00
Abitur	130	282	412
	31.55	68.45	100.00
Abitur with vocational training	23	122	145
	15.86	84.14	100.00
University of applied sciences degree	151	293	444
	34.01	65.99	100.00
University degree	511	678	1,189
	42.98	58.02	100.00
Total	1.337	3,969	5,306
	25.20	74.80	100.00

Source: Estimations based on NEPS data from the adult study

overestimated for them. Indeed, if we only look at women aged 45 and older, we observe a low fertility level for women with university degree of 30 per cent and for women with a university of applied sciences degree of about 25 per cent. A more appropriate approach to study the longitudinal data of the NEPS is an analysis which takes into account the different risk-periods of successive birth cohorts and uses time-dependent covariates to explain the rate of entry into first motherhood.

7.3.2 Model Estimation

Using discrete-time event history analysis (see Section 1.5: 47pp), we study entry into first motherhood. We follow up women from age 16 until the event of a conception leading to the birth of a first child. Women are right censored when they turn older than 45 or when they were interviewed before they have had a first child. In particular, we estimate

Table 7-4: Event history models for entry into motherhood (dependent variable: conception of a first child)

	Model										
Covariate	**1**	**2**	**3**	**4**	**5**	**6**	**7a**	**7b**	**8**	**9**	**10**
Place of Birth											
West Germany (ref.)											
East Germany	0.693***	0.713***	0.793***	0.802***	0.809***	0.858***	0.849***	0.845***	0.844***	0.841***	1.382***
Historic Period											
Period until 1990 (ref.)											
Period from 1991 till 2002	0.122	0.144	0.009	0.020	0.023	0.074	0.048	0.043	0.040	0.055	0.277***
Period from 2003	-0.343***	-0.319***	-0.403***	-0.374***	-0.353***	-0.266***	-0.243***	-0.238***	-0.246***	-0.223**	0.128
East * Period 1991-2002	-0.635***	-0.634***	-0.484***	-0.485***	-0.493***	-0.593***	-0.536***	-0.526***	-0.525***	-0.559***	-0.915***
East * Period from 2003	-0.187	-0.170	-0.118	-0.127	-0.148	-0.310	-0.288	-0.284	-0.278	-0.316	-0.805***
Macro insecurity											
Unemployment rate		-0.004***	-0.024***	-0.023***	-0.023***	-0.016*	-0.018**	-0.018**	-0.019**	-0.016*	0.006
Age dependency											
Log (age-15.9)			2.102***	2.109***	2.160***	1.749***	0.399***				
Log (45.1-age)			7.097***	7.155***	7.192***	6.703***	34.833***	41.777***	41.869***	41.472***	35.265***
Social background											
Father's educational attainment				-0.042***	-0.032***	-0.011*	-0.011*	-0.011*	-0.011*	-0.009*	0.006
Education											
Educational attainment level					-0.027***	-0.013	-0.017	-0.016	-0.016	-0.012	0.004
In education						-0.930***	-0.934***	-0.966***	-0.986***	-0.962***	-0.808***
Fertility pressure							0.875***	1.096***	1.099***	1.087***	0.869***
Employment											
Career resources									-0.001	-0.002*	-0.004**
Full-time employed (ref.)											
Part-time employed										0.260**	0.226**
Unemployed										0.336***	0.303**
Permanent contract (ref.)											
Temporary contract										-0.205**	-0.079
Marriage											
Marital status											1.684***
East * Marital status											-0.706***
Intercept	-5.401***	-5.391***	-35.883***	-35.628***	-35.658***	-33.266***	-157.235***	-187.868***	-188.257***	-186.640***	-159.356***
Number of events	3,969	3,969	3,969	3,969	3,969	3,969	3,969	3,969	3,969	3,969	3,969
Number of sub-episodes	736,730	736,730	736,730	736,730	736,730	736,730	736,730	736,730	736,730	736,730	736,730
Chi^2	270.85	255.47	1861.97	1895.90	1922.80	2297.56	2449.59	2435.28	2435.81	2466.11	4152.96
Degrees of freedom	5	6	8	9	10	11	12	11	12	15	17

Note: *p<0.05; *p<0.01; ***p<0.001; n=5,306

Source: Estimations based on NEPS data from the adult study

logit models with time-constant and time-varying covariates and illustrate some of the effects of these models simulating survivor functions for particular groups.

First, in Model 1 of Table 7-4, we include macro-structural influences of historical periods and the place of birth as explanatory variables into our estimation of the rate of entry into first motherhood. It is easy to see that in our observation window, women born in East Germany are entering motherhood earlier and more often than women born in West Germany, since the coefficient for the East German dummy variable is positive and significant. In addition, compared to the historical period before German unification, there is a decline in fertility in the unified Germany in the period after 2003. In other words, the rate of entry into first motherhood of women in both, East and West Germany, is negative and significant for the years after 2003. However, the result of the interaction term between 'East*Period from 1990 till 2003' also shows that the rate of entry into first motherhood of women in East Germany is significant and negative (hypotheses seven and eight). This supports our hypothesis that there is a greater negative effect of German unification on entry into first motherhood in East Germany. We expected that the rate of having a child will drop drastically in East Germany immediately after the unification, since women were facing a high level of uncertainty in all domains of their life.

In Model 2 of Table 7-4, we control for the changing unemployment rates in East and West Germany (see Figure 1.7 on page 43). As expected, the coefficient is negative and significant. Expressed differently, the higher the unemployment rate the less likely it is for women to enter into first motherhood. This is in agreement with our expectation that women will enter first motherhood less in uncertain times.

In order to test whether women's age at entry into first motherhood initially increases, reaches a peak, and then decreases over the life course, we include in Model 3 of Table 7-4 two dummy-

variables: Log (current age-15.9) and Log (45.1- current age). Both coefficients of these covariates are positive and significant, which means that there is indeed a strong non-monotonic pattern of entry into first motherhood across age. Because the coefficient for Log (45.1-current age) is greater than the coefficient for Log (current age -15.9), there is a right-skewed, bell-shaped curve of entry into first motherhood over the life course (Blossfeld & Blossfeld, 2014).

In a fourth step (Model 4 in Table 7-4) we include women's 'Social origin' as a control variable. As a measure of family background we use father's educational attainment level. The estimate of Model 4 shows a significant negative coefficient for father's education. This means that women from higher social origin indeed enter first motherhood much later than women from lower social origin since families with a higher social background want to maintain their inequality position and therefore invest more in their daughter's education. To which extend the resources of social origin are translated into longer participations in education and higher educational attainment levels will be demonstrated in the following models.

In Model 5, women's 'Educational attainment level' is included. According to the economic theory of the family, women's educational investments should have a strong negative effect on entry into (first) motherhood. The coefficient of women`s educational attainment level is significantly negative. Otherwise said, this model seems to confirm the economic theory of the family that women's opportunity costs are increasing with investments in education. However, the coefficient of women's educational attainment is only negative significant as long as we do not include information on educational enrolment (hypothesis one). As soon as we include educational enrolment in model 6, women's educational attainment level has no additional significant effect anymore. Instead, we find a strong significantly negative effect of educational enrolment. This means that women do not want to violate the sequencing norm of first finishing school before entering into first mother-

hood and therefore postpone entry into first motherhood until they have left the educational system. We therefore conclude that women's education only affects entry into first motherhood via educational participation, not via educational investments. This means that higher qualified women mainly shift their fertility decisions to higher ages and there are no fertility differences with regard to educational attainment levels as assumed by the economic theory of the family. After having included women's educational attainment level and women's educational participation, the effect of father's education has strongly declined. Thus, the effect of social origin works mainly through extended educational participation of women from higher social origin. There is, however, a small negative effect of social origin left which indicates that daughter's from higher social origin postpone their entry into first motherhood more. The reason for this delaying effect might be that having a child while in education endangers the success of educational attainment (see the results in the previous chapters).

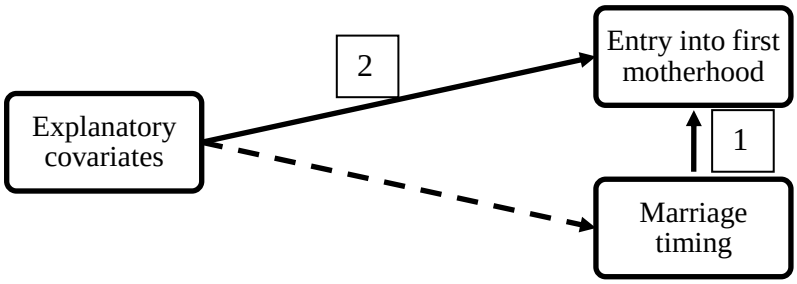
In Model 7a and 7b of Table 7-4, 'Fertility pressure' is included as an explanatory variable. Women who delay entry into motherhood are subject to increasing pressure not only from potential medical problems connected with having children later, but also from violating societal age norms (Hogan 1978). Our estimate in model 7a shows indeed a strong, positive and significant effect of fertility pressure. Put another way, the more women delay first motherhood, e.g. because of extended educational enrolment or giving priority to a job career, the stronger is the effect of fertility pressure. However, fertility pressure in model 7a is highly correlated with one of our age variables that were included in model 3. Therefore, we run model 7b and leave out the variable 'Log (current age-15.9)'. The coefficients of the covariates in model 7a and 7b are very similar and the substantive conclusions are basically the same (hypothesis two). To be on the safe side, we therefore estimate the remaining models in Table 7-4 and 7.5 without the variable 'Log (current age-15.9)'.

Model 8 of Table 7-4 introduces women's 'Career resources' as a time-varying covariate and estimates its effect on entry into first motherhood. The economic theory of the family predicts that women's opportunity costs are increasing with rising income and status. Our results however show that the coefficient of career resources, reflecting the goodness and reward levels of jobs, is not significant (no support for hypothesis three). This might be the case because the employment relationships of young people entering the labour market have become very heterogeneous in Germany during the last two decades (Kurz, Steinhage & Golsch 2005): some young women have got full-time jobs, others only have got part-time jobs, some young women have got only temporary employment contracts whereas others have got permanent employment contracts.

In Model 9 (see Table 7-4), information on women's employment relationships is therefore included, distinguishing between hours of work and duration of the contract. Using full-time employment as the reference category to analyse the effect of hours of work on entry into first motherhood, our estimates show significant positive effects of part-time employment and unemployment on women's fertility. Otherwise said, women who are unemployed and women who work part-time are more likely to have a first child, because it is easier for them to take care of a baby (hypotheses four and five). This is the case because they not only have more time on their own, but they are also less dependent on scarce childcare provision in Germany compared to their full-time working counterparts. In addition, childcare in Germany has been pre-dominantly half-day, women with part-time jobs have been in the position to work in the mornings when their children are at the kindergarten or at school and to care for their children in the afternoon. It is easier for part-time working women in Germany to reconcile the conflict between employment and family.

Controlling for the duration of the contract, our estimates show that women with a temporary contract are less likely to enter motherhood than their counterparts with permanent contracts. This

Figure 7.1: Model for entry into first motherhood including marriage timing



means that women with a permanent contract are more likely to enter first motherhood than women with temporary contracts since women with a fixed-term contract have higher job insecurity and do not want to endanger their future employment opportunities through pregnancy and motherhood (hypothesis six). After controlling for hours of work and type of contract, the effect of career resources is getting significantly negative. This is the effect expected by the economic theory of the family. However, the investments are only part of the story. What is more and more important for fertility in Germany seems to be the flexibilization of the labour market with the increasing proportion of fixed-term employed young people. The lowest fertility is therefore expected for women who are full-time employed in a high status/high income job and who have only a temporary contract. This situation describes the standard employment position of highly educated women when they enter into the German labour market today (Kurz, Steinhage & Golsch 2005).

Finally, we include women's 'Marital status' and the interaction effect 'East*Marital status' as time-varying covariates in model 10 (see Table 7-4). Our results show that huge parts of the effects of other variables in the model of entry into first motherhood are mediated through marriage timing. The partial effects of the explanatory variables in Model 10 capture only the remaining partial ef-

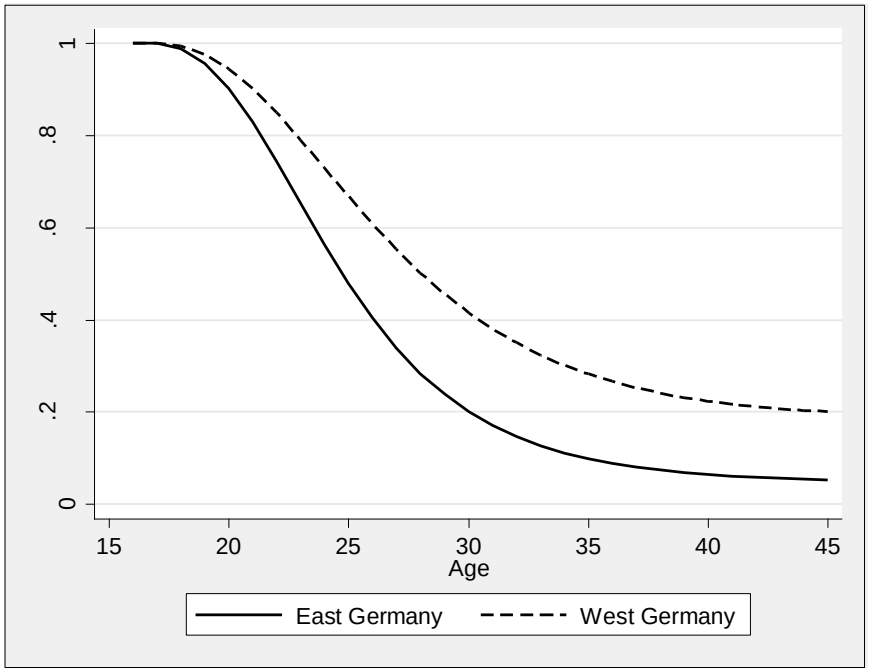
fects of having a first child out of wedlock. As expected, marital status has a strong positive and significant influence on entry into first motherhood for both, East and West German women. However, the interaction term 'East*Marital status' also shows, that this effect is much weaker in East Germany. So, the marital setting has been indeed less important for women in East Germany (see our results in Chapters Three to Five). The substantive effects of most of the other variables remain fairly unchanged in Model 10. Exceptions are the effects of (1) macro structural insecurity measured by unemployment rates, (2) the variable indicating whether a woman is on a temporary contract or not; and (3) the social background variable. All these coefficients turn insignificant when we include information on the marital status of a woman. It seems that these three variables mainly work indirectly through marriage on fertility. In other words, individuals tend to marry more the better the economic situation (low unemployment rate) and the more secure their employment status is (permanent vs. temporary employment contract). Since the marital setting is especially important for women's fertility, higher unemployment rates and temporary jobs lead to less marriages and therefore also to a decline in fertility. In addition, daughters of higher social origin seem to prefer the normative sequence of marriage and then having a baby more than lower social classes. Besides these three covariates, the dummy variables indicating the different historical periods and their interaction terms change their significances. These dummy-variables now reflect the historical fertility pattern after controlling for the different marriage behaviour in East and West Germany. These partial effects are very specific for fertility out of wedlock and will not be interpreted any further.

The effects of event-history models on the rate of entry into first motherhood in Table 7-4 are complex, in particular since they are based on time-dependent covariates. It is therefore useful to estimate survivor functions based on these rate models to get an idea about the influence of the covariates on the rate of entry into first motherhood. We therefore simulate survivor functions

based on the models in Table 7-4 in order to illustrate the effects of substantively interesting models on women's entry into motherhood. Figure 7.2 shows the changes in the rate of entry into motherhood across age for East and West German women. It is easy to see that women in East Germany enter motherhood earlier and more often than women in West Germany. At the end of women's fertility period at about age 45, 20 per cent of West German women are childless whereas the childlessness is about 10 per cent for women in East Germany.

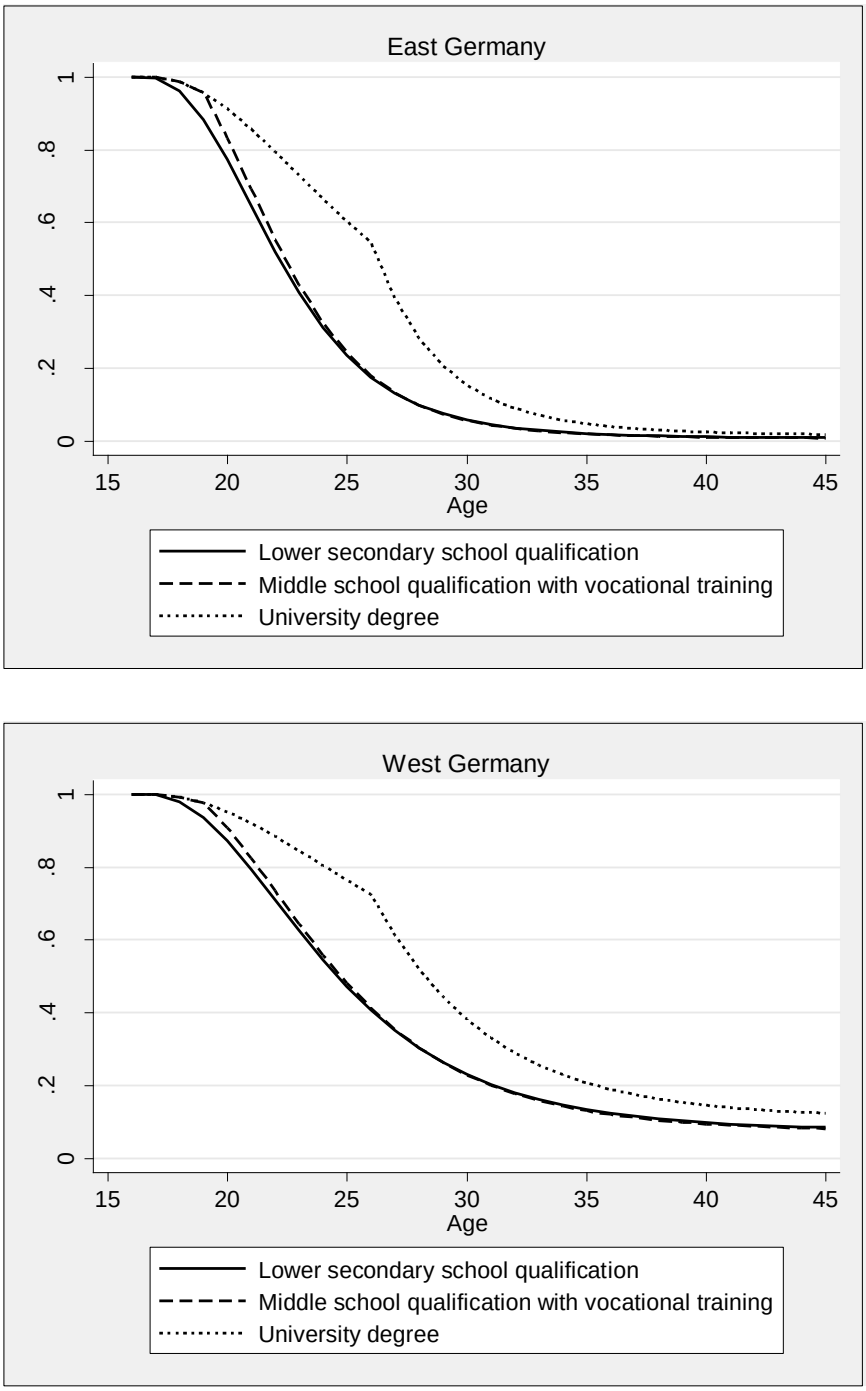
Figure 7.3 shows the rate of entry into motherhood by education in East and West Germany. The survivor functions illustrate that women, who leave the educational system with different educational degrees, have various patterns of entry into motherhood across the life course. These

Figure 7.2: Changes of entry into motherhood over the life course for East and West German women (survivor functions)



Source: Estimations based on NEPS data from the adult study

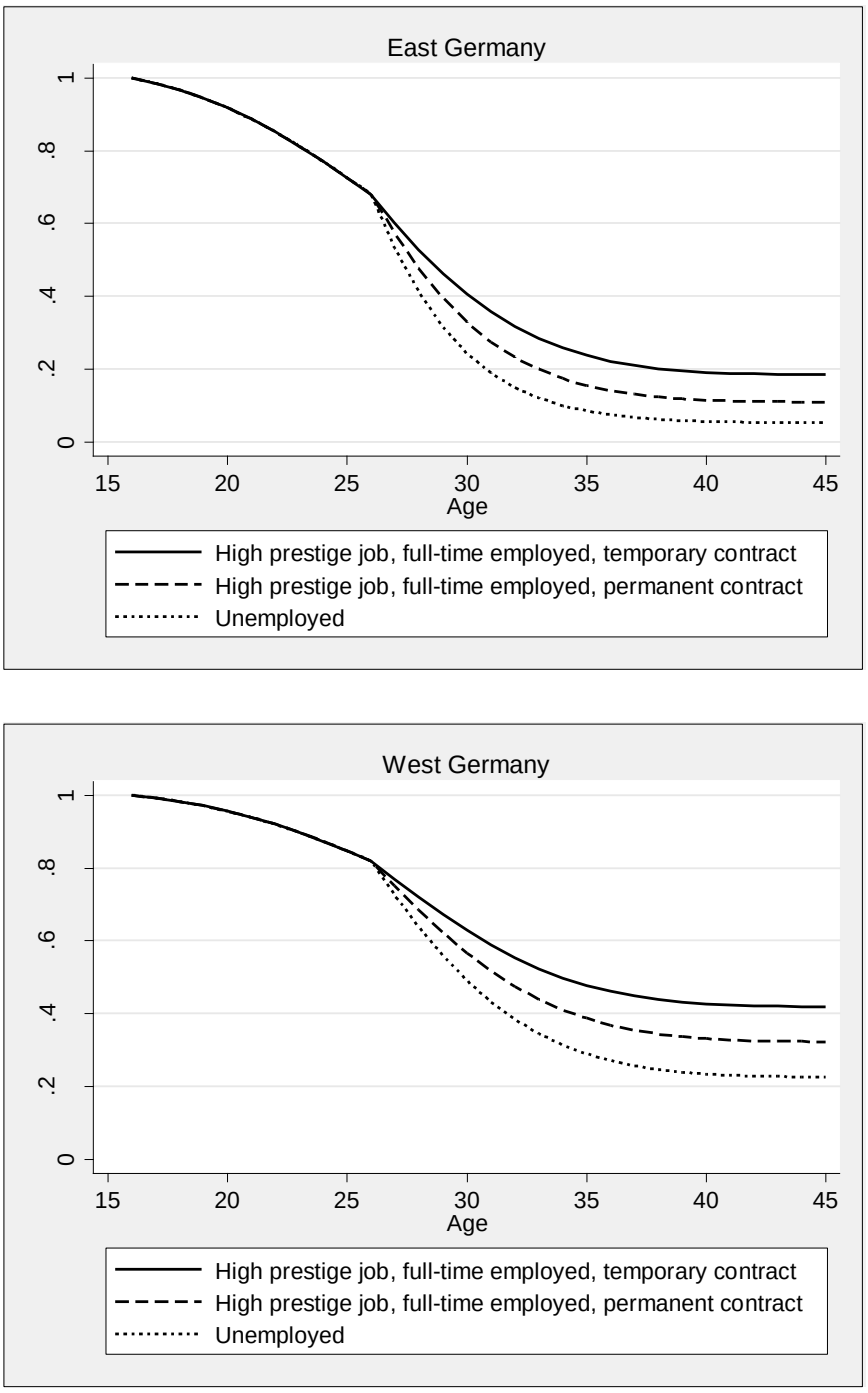
Figure 7.3: Changes in the rate of entry into motherhood over the life course by education in East and West Germany (survivor functions)



Source: Estimations based on NEPS data from the adult study

patterns are mainly the result of different durations of educational participation. Women who leave the educational system earlier (with lower secondary school qualification or middle school qualification with vocational training) start to enter into first motherhood at younger ages. Women with university degree at first tend to delay the birth of a first child

Figure 7.4: Changes in the rate of entry into motherhood over the life course for highly qualified women by different employment careers in East and West Germany (survivor functions)



Source: Estimations based on NEPS data from the adult study

until they have left the educational system. They then quickly catch up with their lower qualified contemporaries so that the gaps in childlessness between these various educational groups almost disappear at the age of 45. Thus, education has mainly an effect on the time structure of entry into first motherhood over the life course of differently quali-

fied women but not so much on their final childlessness (hypothesis one). This is of course only true, if higher qualified women do not turn their better educational investments into better jobs.

Figure 7.4 shows the rate of entry into motherhood for highly educated women with different job careers in East and West Germany. We simulate the survivor functions of women with university degree, (1) who have a job with a high prestige (medical doctor) and are full-time employed on a temporary contract; (2) who have a job with a high prestige (medical doctor) and are full-time employed on a permanent contract; and (3) who were not able to turn their educational investments into a job career (unemployed). The survivor functions in Figure 7.4 show very different trajectories of entry into motherhood for these highly educated women with different job careers. After finishing education, women who are not able to turn their educational investments into a job career enter motherhood earlier and more often than their counterparts with a job. For those women, who are able to turn their educational investments into job resources, the survivor functions show that women with a permanent contract are less often childless than their counterparts with temporary employment contracts. The patterns of the survivor functions in East and West Germany are very similar. However, the level of childlessness is generally higher in West Germany than in East Germany as was already demonstrated in Figure 7.3.

7.4 Summary of Empirical Findings

In this chapter, we have studied the effects of women's better education and improved career opportunities on entry into first motherhood in East and West Germany with recent new longitudinal data. Our descriptive analysis of the NEPS data at the time of the interview showed that the huge majority of women entered into first motherhood (83 per cent in East Germany and 72 per cent in West Germany). The descriptive analysis based on a

cross-sectional perspective seemed to support the economic theory of the family that women with higher educational attainment level have a lower fertility. However, our longitudinal analysis has then shown that this inference from the cross-sectional analysis is misleading.

Utilizing the longitudinal design of the National Educational Panel Study (NEPS), we conducted an event-history analysis to study the impact of educational enrolment, educational attainment level, labour force participation and career advancement on women's timing to have a first child. According to the economic theory of the family, women's educational attainment level should have a strong negative effect on women's entry into motherhood. However, this was not the case at all. We did not find any negative effect of educational investments on entry into first motherhood. Instead, women with a higher educational attainment level only participate longer in education and therefore tend to postpone first motherhood. Thus, education has mainly an effect on the time structure of entry into first motherhood over the life course of differently qualified women but not on their final childlessness.

Further, the results of our analysis demonstrated that women's career resources and different forms of employment have an effect on entry into first motherhood. The economic theory of the family is only right, if women are able to turn their educational investments into career resources through full-time employment. Higher income and status of full-time employment clearly increase women's opportunity costs to have a first child and therefore lead to lower rates of entry into motherhood. With regard to employment intensity, women who are unemployed and women who work part-time are more likely to have a first child than women who are working full-time (hypothesis five). They find it easier to reconcile the conflicting demands of the family and job. This chapter also clearly shows that women with a temporary contract are less likely to enter first motherhood than

women with a permanent employment since women with a fixed-term contract have higher job insecurity and do not want to endanger their future employment opportunities through motherhood. Therefore, women's career resources, as suggested by the economic theory of the family, are only a minor part of the whole story. What is more important for the decrease and the delay in fertility in Germany seems to be the flexibilization of the labour market with a quickly rising proportion of fixed-term employed young people. The lowest fertility can be observed for women who are full-time employed in a high status/high income job and who have only a temporary contract. This situation exactly describes the standard employment position of highly educated women when they enter into the German labour market today.

Finally, this chapter shows clearly that East German women's fertility behaviour changed drastically through German unification. The sudden increase in uncertainty after German unification in East Germany resulted in a steeply declining rate of entry into first motherhood (hypotheses seven and eight). Although the rate of entry into first motherhood has recovered in East Germany after 2003, the high and early rate of entry into first motherhood of the GDR was never reached again. West German women were not much affected through German unification. Their rate of entry into first motherhood has only declined after 2003. All in all, the rates of entry into first motherhood in East and West Germany are therefore not yet on the same track.

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8 Educational Assortative Mating and Divorce

In the last few decades, divorce rates have risen in most modern societies (De Graaf & Kalmijn, 2006; Diekmann & Engelhardt, 1999; Fischer & Liefbroer, 2006; Raley & Bumpass, 2003). Based on the dominant traditional family model from 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 studying the effect of women's education on divorce is voluminous. Yet, most empirical studies have concentrated their analysis only on the correlation between women's educational attainment level and divorce risk (life span development & timing of transitions and events, see Chapter 1.3), after controlling for other influences. For example, the studies of De Rose (1992) and Hoem (1997) show that the risk of divorce rises with women's better education. By contrast, 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 with 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. Bracher et al., 1993; Jalovaara, 2001; Rapp, 2008). These few studies have provided inconclusive evidence. For example, results for the Nordic countries (Jalovaara, 2003; Lyngstad, 2004), Germany (Rapp, 2008) and the U.S. (Gihleb & Lifshitz, 2012; Tzeng & Mare, 1995) show a negative effect of the level of education of both partners on divorce risk. However, findings for the Netherlands (Poortman & 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 based 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 and that heterogamous couples are more likely to experience marital disruption. Kalmijn (2003) is the first to show that union disruption in the Netherlands has a curvilinear relationship between education of the spouses and divorce.The problem with 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 predicts that, for couples where women are marrying a partner with a lower educational attainment, 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 attempts 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 (principle of linked lives, see Chapter 1.3). These disaggregated models will potentially yield impressive increases in theoretical understanding and a more clear-cut interpretation of estimation effects.

Using NEPS data, we are analysing the divorce risk of couples where women have married educationally downward, upward or homogamously in East and West Germany over the last four decades (principle of place and time, see Chapter 1.3). In particular, the NEPS data allow us 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 chapter 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 variables used. Third, we report the results of our longitudinal analysis and draw some more general conclusions regarding divorce theories.

8.1 Theoretical Framework and Hypotheses

8.1.1 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 labour 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 labour 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 opportunities for participation in gainful employment. In other words, the

traditional family model forces women into 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*) (first hypothesis). De Graaf and Kalmijn (2006) suggest that in this marital setting the husband might also 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 increase the divorce risk (*spousal status competition hypothesis*) (second hypothesis).

In a gender-traditional society, according to the economic theory of the family, men and women invest differently in their human capital. Men tend to invest in qualifications and skills that increase their earnings capacity while women tend to invest in non-market skills enabling them to fulfil 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). To put it differently, 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 & 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*) (third 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*) (fourth hypothesis) (De Graaf & Kalmijn, 2006).

8.1.2 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 importantly, 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 & Timm, 2003: 25).

8.1.3 Dimensions of Education

The interpretation of education in the traditional economic family model is 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. To put it differently, 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 & Mohr, 1985: 1235). In Bourdieu's theory of cultural reproduction (1990), the ability to understand and use educated language as well as the familiarity with the dominat culture within a society is seen as

cultural capital. Like cultural capital, habitus is transmitted through socialization and education. It is a set of attitudes and values held by the individual that constitutes not only a specific way of thinking but also the competence to behave in specific social settings.

8.1.3.1 Social Meanings of Education in Marriages

Both sociological and economic theories suggest that the probability of a satisfactory marriage is higher the more similar the spouses are with regard to education (Becker et al., 1977; Bumpass & Sweet, 1972 Goode, 1966). They emphasize 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 & Sweet, 1972). Conversely, the more different the spouses are with respect to education, the higher the likelihood of misunderstandings and tensions leading to 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

Figure 8.1: Trade-off between the benefits from division of work and benefits from communication for different educational gaps within couples

Educational gap within couple	Benefits from division of work	Benefits from communication
small	small	large
↓	↓	↓
big	large	small

Source: Own illustration

losses (or gains) from division of work (ΔW) (see Figure 8.1). The higher the gains from division of work within a couple, the higher the probability of losses of communication and vice versa. Put differently, 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 labour force experience. However, in most empirical analyses, economists tend to neglect the gains and losses of communication almost completely ($\Delta C \sim 0$).

8.1.3.2 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 (see Table 8-1: 223), 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:

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

$$\Delta E_{gap} < 0$$

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*) (fifth hypothesis):

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

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

8.1.3.3 Women Who Marry Homogamously

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 ($C_{max,E}$) (see Table 8-1: 223). This theory also predicts that homogamous couples with higher education gain more from marriage than homogamous couples with lower education (Becker et al. 1977). In the same vein, sociologists expect increasing advantages from more rewarding communication, if the educational attainment of homogamous couples rises (Amato, 1996; DiMaggio & Mohr, 1985; Dronkers, 2002; Hoem, 1997; Lewis & Spanier, 1979; Ono, 1998). In estimating the gains of educational level in homogamous couples (${}_{\Delta}E_{lev}$) on divorce, we can therefore closely identify the gains of communication at different levels of education (${}_{\Delta}C$) and test whether the predicted gains from communication increase with the level of education (*gains from higher education hypothesis*) (sixth hypothesis).

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

${}_{\Delta}E_{lev} > 0$

Therefore, in discrete event history analysis for homogamous couples we expect 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 $\alpha_1 \equiv -\Delta E_{lev} \quad \rightarrow \quad \alpha_1 < 0$ and other covariates controlled for.

8.1.3.4 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 reversed among the spouses (see Table 8-1: 223). Hence, in these non-traditional couples it should be the wife who has a full commitment to the participation in the labour market and determines the status of the family as a whole, while the husband takes major responsibility for maintaining the household and rearing the children, restricting his opportunity for gainful employment. In the non-traditional family model, men consequently become economically dependent 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*) (seventh hypothesis):

with $\alpha_1 \equiv {}_{\Delta}E_{gap} \rightarrow \quad \alpha_1 < 0$ 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*) (eighth hypothesis).

The economic theory of the family is gender-neutral and assumes that changes for wives and husbands are always symmetric. Expressed differently, gender roles within couples are assumed to be simply reversible. However, there is the doing gender theory in sociology which claims that the behaviour 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 behavioural changes between the spouses asymmetric. This means that wives change but husbands do not or at least do not 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 behaviour (West & Zimmerman, 1987). Therefore, if females are breadwinners and males are homemakers, they are socially accountable and risk negative judgements from friends, relatives and colleagues (Fenstermaker, West & Zimmerman, 1991; West & Zimmermann, 1987). They also threaten to a certain extent their gender identities (Bielby & Bielby, 1989) (*gender norm violation hypothesis*) (ninth hypothesis). These couples are therefore very likely to compensate for this deviation from the norm by adopting traditional gender behaviour 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 (Brines, 1994; Hochschild & Machung, 1989). This prediction is supported by empirical studies showing that husbands do not increase their housework hours when their wives work more (Blau, Ferber & Winkler, 2010; Cooke, 2010; Noonan, 2013; Schulz & Blossfeld, 2012). The share of the wife's housework is in fact decreasing, but not because the husband works more, but because the wife is doing less if she is in paid employment (Baxter, 1997). Put differently, 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*) (tenth hypothesis) (see Table 8-1: 223).

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 (see Table 8-1: 223), 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 ($\Delta W<0$). Otherwise said, 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 (see Table 8-1: 223), 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 ($\Delta W > 0$) (see Table 8-1: 223). 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.

8.1.4 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

Table 8-1: Summary of expected benefits

Women married	Benefits from division of work	communication	Theory
up	Large	Small	Economic theory
homogamous	No	Large	Economic theory
down: (1)	Large	Small	Economic theory
(2)	No	Small	Doing gender theory
(3)	Very small and constant	Small	Doing gender theory
(4)	Small (about equal to communication)	Small	Doing gender theory

Source: Estimations based on NEPS data from the adult study

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 gains 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.

8.1.5 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. Axinn & Thornton, 1992; Bernardi & Martinez-Pastor, 2011; Berrington & Diamond, 2000; DeMaris & Rao, 1992 Lillard et al., 1995). 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 & McDonald, 1993; Thompson & Colella, 1992). These individuals are also assumed to

be more likely to divorce. Put another way, 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 (Bernardi & Martinez-Pastor, 2011; Morgan & Rindfuss, 1985; Teachman, 2002;). 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. To put it differently, 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. Böttcher, 2006; Diekman & Engelhardt, 1995; Dyer, 1986; Glick & Norton, 1977; Klein, 1999; South & Spitze, 1986; 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. Otherwise said, a greater age difference should be connected with a lower marital quality and stability (Bumpass & Sweet, 1972; Engelhardt, 2002; Levinger, 1965). 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; Rapp, 2008; Stauder, 2006).

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. Hence, 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. Put another way, 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 & Engelhardt, 1997; Dinkel, 2006; Fooken & 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 (see Figure 1.6: 24). 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 (see Figure 1.6: 24; Alt 2002). We will therefore control for the birth cohorts and period effects for East and West German women in our analysis.

8.1.6 Definition of Variables

Dependent variables. We analyse the divorce of the first marriage for women using NEPS data (see Section 1.4: 41 pp). 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.

Methodological issue with survey divorce data. Previous research suggests that survey-gathered divorce data is sometimes inaccurate. Researchers have found, dependent on the study, that the survey estimates of divorce are between 8% and 25% less than the Vital Statistics figures (Bumpass, Castro-Martin, & Sweet, 1991; McCarthy, Pendleton, & Cherlin, 1989; Preston & McDonald, 1979; O'Connell, 2007). Thus, assuming that the Vital Statistics are correct, survey data are underestimating the divorce rate. Furthermore, it is a well-documented finding in the literature is that divorce information from men tends to be less accurate than divorce information from women (Bumpass et al., 1991; McCarthy et al., 1989; Preston & McDonald, 1979). By focusing our analysis only on women, we are facing fewer problems than other divorce studies. An analysis of the trustworthiness of divorce studies by Mitchell (2010) has shown that nonresponse error is responsible for the majority of the error in divorce data. Misreporting the divorce event

was rare, and more than two thirds of respondents provided a divorce date within 6 months of the actual date (Mitchell, 2010).

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 'early marriage' into our analysis, indicating that the woman's age at entry into first marriage was under 23 years. 'Late marriage' is the reference category and indicates if she was 23 years or older. We do not distinguish 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).* The educational systems in East and West Germany have been somewhat different during the time of division (Blossfeld, Blossfeld & Blossfeld, 2015). Whilst the GDR was aiming at offering secondary education to everyone with compulsory schooling until grade 10 (Günther, 1979), the FRG with its primary and secondary school system and three parallel tracks was rather selective and only offered compulsory schooling until grade 9 (Cortina, Baumert, Leschinsky & Mayer, 2003). Nevertheless, students in both Germanies were selected into vocational and academic tracks which

make educational attainments among spouses comparable between East and West Germany. After German unification, the basic structure of the West German educational system has been transposed into East Germany.

Therefore, 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 university of applied sciences degree 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 important upward and downward steps in terms of marriage. Rather than using finely measured years of education, we distinguish only four socially important discrete educational attainment levels to model upward, downward and homogamous marriages: (1) lower secondary and inter-

mediate schooling without vocational training, (2) lower secondary and intermediate schooling with vocational training or higher secondary schooling with and without vocational training, (3) university of applied sciences degree, and (4) university degree. Based on this scheme, we distinguish several 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 distance between the spouses.

8.1.7 Results

8.1.7.1 Descriptive Overview

Table 8-2 shows the absolute numbers and percentages of women in East and West Germany who have experienced a divorce of their first marriage up to the time of the NEPS interview. It reveals that in absolute numbers 175 women from East Germany and 567 women from West Germany have experienced a divorce. However, one has to take into account, that the number of women at risk is also much greater in West Germany (3,116) than in East Germany (841). Thus, almost 21 per cent of women in East Germany and about 19 per cent in West Germany have experienced the disruption of their first marriage up to the time of the NEPS interview. In other words, the rate of women whose first

Table 8-2: Women's divorce events in East and West Germany (only first marriages)

Place of birth	No divorce	Divorce	Total
East Germany	666	175	841
	79.2	20.8	100.0
West Germany	2,549	567	3,116
	81.8	18.2	100.0
Total	3,205	741	3,946
	81.3	18.7	100.0

Source: Estimations based on NEPS data from the adult study

marriage got divorced up to the time of the NEPS interview is quite similar in East and West Germany.

Table 8-3 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. Put differently, 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 8-3 reveal that

Table 8-3: 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

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.

8.1.7.2 Effects of Control Variables

We start our multivariate analysis (see Section 1.5: 47pp) with a rate model that includes the effects of important control variables in Table 8-4. We analyse 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.

First, in Model 1 of Table 8-4, 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 our observation window.

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

Table 8-4: 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*

Continuation of Table 8-4								
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

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 8-4. 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 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 in East Germany is significant and negative. Comparing the main and interaction effects 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 8-4, 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 8-4, 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 8-4, 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.

8.1.7.3 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. Chan & Halpin, 2005; De Rose, 1992; Hoem, 1997). We therefore include in Model 6 of Table 8-4 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 8-4 is positive and significant (hypothesis three).

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 Model 7 of Table 8-4. 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 8-4, the effect of husband's educational attainment level is indeed negative and significant and therefore also supports hypothesis three.

Finally, in Model 8 of Table 8-4, 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. Bracher et al., 1993; Jalovaara, 2001; Rapp, 2008). 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 (hypothesis three).

8.1.7.4 Effects of Educational Homogamy and Heterogamy on Divorce

The problem of the analysis of educational effects in Table 8-4 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 8-4, we estimate the effect of a time-constant dummy variable for educationally heterogamous couples in Model 1 of Table 8-5 (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) (hypotheses six and seven). Expressed differently, 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.

In the next two steps, we therefore analyse how the stabilizing effect of communication in homogamous couples changes with the level of education (Table 8-6) and how the

Table 8-5: The effects of educationally homogamous and heterogamous marriages on the divorce of first marriage

Variables	
	1
Control variables (see Table 8-4)	
...	
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<0.05; *p<0.01; ***p>0.001; n=3,946
Source: Estimations based on NEPS data from the adult study

stabilizing effect of specialization in educationally heterogamous couples changes with the educational gap within couples (Table 8-7).

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

In Table 8-6, we present the results of an analysis that only focuses on educationally homogamous couples. Put another way, both partners in these marriages have the same educational attainment level. In these models, the control variables of Table 8-4 are included, but not reported again because the substantive effects are the same as in Table 8-4. The economic theory suggests that the advantage of the division of work within homogamous couples is close to zero (W ~ 0) because spouses are very similar (see Table 8-1: 223). 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 8-6 indeed support this hypothesis (hypothesis six).

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

Table 8-6: Effect of couple's educational attainment level on the divorce rate for homogamous couples

Variables	Model
	1
Control variables (see Table 8-4)	
...	
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<0.05; *p<0.01; ***p>0.001; n=2,466
Source: Estimations based on NEPS data from the adult study

training (EduLev = 1) are $\hat{C}_1 = 1 * 0.184 = 0.184$ and for a couple with university degree (EduLev = 4) are $\hat{C}_4 = 4 * 0.184 = 0.736$.

8.1.7.6 The Effect of Educational Gaps on Divorce in Educationally Heterogamous Marriages

Table 8-7 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 8-4 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. Put in a different way, the bigger the educational gap between the spouses, the more stable the marriage and the lower the risk of divorce (hypothesis ten). The results of Model 1 in Table 8-7 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 analysing women's upward (see Table 8-9) and downward (see Table 8-10) marriages separately further below.

8.1.7.7 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 8-8 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 (hypothesis six). If the doing gender model is right, downward marriages suffer from both, from insufficient gains from division of work and lower gains from communication (hypotheses seven and eight). In addition,

Table 8-7: Effect of couple's educational gap on the divorce rate for heterogamous couples

Variables	Model 1
Control variables (see Table 8-4)	
...	
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<0.05; *p<0.01; ***p>0.001; n=1,480
Source: Estimations based on NEPS data from the adult study

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 these unions 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.

Table 8-8: Effects of women's upward, downward and homogamous marriage on the divorce rate (only first marriages)

Variables	1
Control variables (see Table 8-4)	
...	
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<0.05; *p<0.01; ***p>0.001; n=3,946
Source: Estimations based on NEPS data from the adult study

Homogamous marriages have a moderate divorce rate, because they cannot rely on gains from division of work but mainly on gains from communication.

8.1.7.8 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 8-9. There is no significant effect. Then we include only husband's education into Model 2 of Table 8-9 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 (hypotheses three and five). In Model 3 and 4 of Table 8-9, we estimate the impact of the educational gap between the spouses on the divorce rate of traditional couples. As suggested by the

Table 8-9: Effects of husband's and wife's education on divorce for married up women

Variables	Model			
	1	2	3	4
Control variables (see Table 8-4)				
...				
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<0.05; *p<0.01; ***p>0.001; n=992

Source: Estimations based on NEPS data from the adult study

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 analyse 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.

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 8-6, 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 expect, 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.

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

In Table 8-10, 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 fami-

ly 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 8-9 (-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 8-10: Effects of husband's and wife's education on divorce for married down women

Variables	**Model**			
	1	**2**	**3**	**4**
Control variables (see Table 8-4)				
...				
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<0.05; *p<0.01; ***p>0.001; n=488
Source: Estimations based on NEPS data from the adult study

Table 8-10 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 (hypotheses seven and eight are not supported) and in favour of the third explanation of the doing gender approach (hypothesis nine). 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 $|\Delta \hat{W}|=|-0.287|$.

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.

8.1.7.10 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 8-11, 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 8-4. 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 (Fenstermaker et al., 1991; West & Zimmermann, 1987). These circumstances reduce the probability of a satisfactory marriage and increase the proneness to divorce.

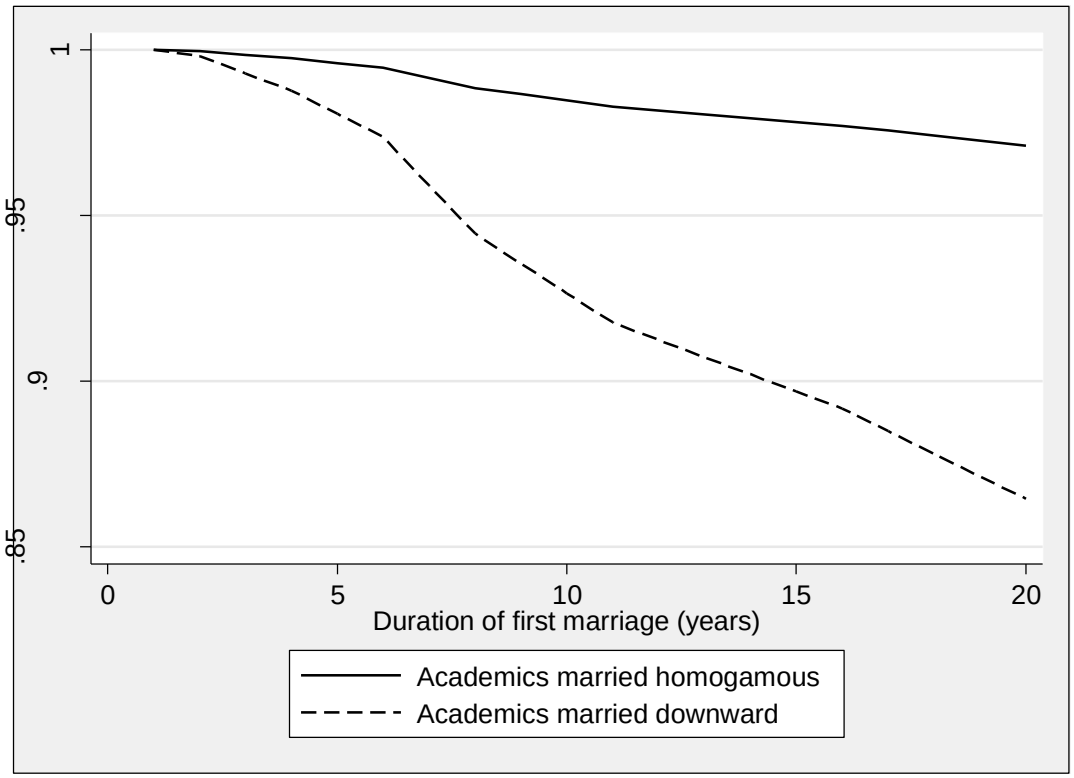
Figure 8.2 shows the estimated survivor functions (based on Model 1 of Table 8-11) for both, academic women who married educationally homogamous and down. It is easy to see that marriages, where highly educated women have married educationally down are much less stable and divorce quicker and more often than marriages among university graduates. After 20 years of marriage, only 3 per cent of the educationally homogamous

Table 8-11: 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 8-4)	
...	
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<0.05; *p<0.01; ***p>0.001; n=
Source: Estimations based on NEPS data from the adult study

Figure 8.2: Survivor functions for married women with university degree who married educationally homogamous and downward



Source: Estimations based on NEPS data from the adult study

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) in Table 8-2, then married down women with university degree have still more stable marriages. In addition, as Table 8-3 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 Figure 8.2 with the average divorce rate of married up women in Table 8-3 (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.

8.1.8 Summary of Empirical Findings

This chapter investigates 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 mainly the relative educational resources that are important for the divorce rate. (2) Most of the divorce studies analysed 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 analysed 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 marriage. 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 behaviour 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 & Blossfeld, 2012; Grunow, 2013). 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 in the future, 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.

8.1.9 References

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9 Conclusion

Over the last decades, family formation and dissolution processes have undergone remarkable changes in Germany. These developments can be described by demographic transformations such as declining fertility, rising ages at first birth and first marriage, increasing rates of premarital cohabitation as well as changing separation and divorce rates (Calot, 1998; Frejka & Calot, 2001; 2004). They are associated with unprecedented shifts in social norms and values in modern societies (Beck & Beck-Gernsheim, 2002; Giddens, 1991; Grunow, Aisenbrey & Evertsson, 2011; Lesthaeghe & Surkyn, 1988; Mayer & Huninink, 1990). Demographic life events are central to the lives of individuals and, in particular, to women, and are embedded into a specific institutional and historical context (Meyer, 1990). Important life course decisions of individuals are often not taken in isolation and are part of a more complex interdependence of developments in several life domains (Mayer, 1990; Willekens, 1999).

One of the main factors for the demographic change has been attributed to the educational expansion, which is connected with a lengthening of the time young people spent in education, a declining inequality in the gender-specific participation in higher education and an increase in the average qualification level of men and women across birth cohorts (Mayer, 1990). In this thesis, we focused on the life courses of women in East and West Germany. From this perspective, the increasing enrolment in education means that young women stay longer in a period of social immaturity and economic dependence. This does not only increase women's conflict between full-time education and having children but also delays women's readiness to enter into a union and to have babies. The striking gains in education by women relative to men have turned the educational system into a marriage market and increased the likelihood that young people with similar educational attainment levels meet and associate with each other. Women's rising educational investments across cohorts are associated with a higher female labour force participation and

higher wages for women. This leads to rising costs of children and increases the conflict for women in balancing family and professional responsibilities in Germany (Grunow, 2013). Women's higher education is also connected with an increasing autonomy and autarchy later in life and makes it easier for women to get out of an unhappy nonmarital or marital union.

In addition, the labour market was characterized by important developments. There has been a trend towards upskilling and tertiarization of the occupational structure (Gallie et al., 1998; Mayer & Solga, 2008) that makes it easier for qualified women to find an appropriate job and to make their own successful careers. At the same time, different forms of part-time work have expanded in the employment system, which help women to reduce their conflict between work and family demands (Hakim, 1997). Finally, the general trend towards labour market flexibilization has increased the proportion of fixed-term employment among the young generation, in particular among the higher qualified men and women (Buchholz, 2008). This often leads to an additional delay of long-term binding commitments such as entry into a union or parenthood.

Compared to other industrialized societies, Germany has experienced a particular development by the separation into a socialist and a capitalist state after World War II and the reunification of Germany after the fall of the Wall. While East and West Germany share the same history before the division, there have been great differences between the lives of East and West German women during the period of separation. The socialist state in East Germany supported mother's educational enrolment and full-time employment by providing extensive child care as well as financial and institutional support. The West German welfare state, on the other hand, privileged the more traditional 'male breadwinner' and 'secondary earner' marriage through tax incentives and only moderate childcare provision for mothers (Obertreis, 1986; Trappe, 1995; Trappe & Rosenfeld, 2000). The

fall of the Wall has resulted in unusual turbulences and unexpected continuities in the transformation of life courses, particularly in East Germany (Diewald, Goedicke & Mayer, 2006; Mayer, 1990). Men and women in East Germany have experienced a difficult phase of the transition from socialism to capitalism that was connected with an unprecedented level of economic and social uncertainty that influenced their family events in the life course such as marriage, childbirth and divorce.

This chapter wraps up and discusses the findings of the preceding seven empirical chapters. Firstly, we summarize the major results of the empirical analyses. Secondly, we reflect upon the implications of these findings. Finally, we debate the limitations of this study and express various suggestions for future research.

9.1 Central Findings

Chapter Two focused on women's sequences of different partnership states over the early life course, the change in the timing of entry into marriage as well as the relationship between living arrangements and entry into first motherhood for selected birth cohorts in East and West Germany. The descriptive analysis has shown that East and West German women delayed their entry into marriage over the successive birth cohorts, leading to an overall lower proportion of ever married women. At the same time, the proportion of German women who remained single until the age of 35 has been stable over the successive birth cohorts. What has changed in Germany are women's partnership formation patterns. Cohabitation as a first type of union gained in importance while the proportion of women who entered straightly into marriage has strongly declined. East German women generally start their families at younger ages. Nowadays, the vast majority of East and West German women enter into cohabitation first. Nevertheless, marriage still seems to be important to women in Germany since the majority of cohabiting women transformed their nonmarital unions into marriages. Hence, cohabitation is not yet an al-

ternative to marriage for most young people in East and West Germany. It rather has become an additional stage in the marriage process of women in Germany.

Union formation processes. Using event history models, we have then studied the impact of place and historical time, macro-structural insecurity, education and the birth of children on women's entry into a first union (cohabitation vs. marriage) and the transition from cohabitation to marriage (vs. separation) in more detail. In East and West Germany, cohabitation has become increasingly widespread as a first form of living arrangement both across cohorts and across historical periods. While the rate of separation of cohabitation has not changed across decades, the transition rate from cohabitation to marriage has declined over historical time. This means that cohabitations are increasingly common in East and West Germany but have not yet reached the state of an alternative to marriage, in particular in West Germany. If we study the educational match of cohabitation in more detail, we see that women's downward cohabitation has been stable across decades. The increase of cohabitation was therefore based on homophilous and upward cohabitations with regard to the educational attainment levels of the partners.

Our analysis shows that many young people choose cohabitation as a more flexible living arrangement in a period of social immaturity and life course uncertainty, e.g. during a period of educational participation. Educational enrolment itself leads to a postponement of women's entry into a first union – being it cohabitation or marriage. However, if women start a union while enrolled in education they enter more often into cohabitation than marriage. Hence, the rising age at entry into marriage has at least partly been offset by an increasing duration of premarital cohabitation. A woman's educational attainment level has no effect on entry into first marriage but it increases the rate of entry into cohabitation. With women's increasing educational attainment level, these cohabitations are then also more often turned into marriages and less often dissolved. If women are better edu-

cated than their partner, cohabitations are more often dissolved and less often turned into marriages. This means that the diffusion of cohabitation, to some extent, acts as a structural filter that decreases the rate of marriage if women have a higher educational attainment level than their partner. The educational match of the parents and, therefore, mother's role model has a strong effect on daughter's educational assortative mating. Mothers with a less educated partner have daughters that are also more likely to cohabit with a less educated partner. In contrast, mothers who are in a more traditional union, where the father has a higher education than the mother, have also significantly more often daughters marrying a better educated partner.

When women are expecting a child, the marriage rate is higher than the rate of cohabitation in both East and West Germany, independent of the educational match of the partners. The biggest difference between East and West German women can be found in the role of premarital conception and the prevalence of childbearing. West German women experience a strong increase of the rate of entry into marriage when they are getting pregnant; this is true for both single women and cohabiting women. But, this effect is much less strong for East German women and suggests that East Germans see cohabitation much more often as an alternative to marriage. This erosion of traditional marriage norms in East Germany is also reflected by the stabilizing effect of the presence of a child on cohabitation. In other words, the importance of marrying to 'legitimate' a birth has become much less compelling in East Germany. Macro-structural insecurity, in terms of high unemployment rates, has a delaying effect on women's entry into marriage, though we were able to show that this is only true for homogamous and upward marriages.

Fertility processes. In Chapters Six and Seven, we have analysed women's fertility behaviour in East and West Germany. Although Germany is faced with a low fertility level, the huge majority of women under study have entered into motherhood. In Germany, be-

coming a mother is strongly influenced by two competing societal norms: First, a normative sequencing norm that women should first finish education and enter the job market before they have their first child. Second an age norm, representing societal expectations about the appropriate age to start having children. Our difference-in-differences analysis of women's entry into motherhood during educational enrolment demonstrated that the conflict between the sequencing norm and the age norm is dependent on women's age, social origin, and pronatalist state support. Social origin has only a negative effect on women's entry into motherhood, if women are still participating in education. Women from higher social origin want to maintain their class position from one generation to the next and don't want to risk their educational career through entry into motherhood.

The description based on a cross-sectional perspective seemed to confirm the predictions of the economic theory of the family that women with higher educational attainment levels have a lower fertility. However, our longitudinal analysis did not find any negative effect of educational investments per se on entry into first motherhood. Instead, women with a higher educational attainment level only participate longer in education and therefore tend to postpone first motherhood. So it is not educational investment that is in a permanent conflict with fertility over the life course of women, but it is women's extended educational participation which leads to a temporary delay of entry into first motherhood.

Our results only support the economic theory of the family, if women are able to turn their educational investments into career resources through full-time employment. Better job quality and status of full-time employment clearly increase women's opportunity costs to have a first child and therefore lead to a lower rate of entry into motherhood. What seems to be much more important for the fertility decline is that women with only a temporary contract are less likely to enter first motherhood due to their higher job insecurity. These women do not want to endanger their future employment opportunities through moth-

erhood. Hence, besides the increased opportunity costs, the delay in fertility in Germany seems to be also the result of the flexibilization of the labour market with a quickly rising proportion of fixed-term employed young women and their partners.

Finally, our findings indicate that East German women's fertility behaviour changed drastically through German unification. The sudden increase in uncertainty and the change in pronatalist family measures after German unification in East Germany resulted in a steeply declining rate of entry into first motherhood. Especially for women enrolled in education the sudden end of pronatalist policies after unification has led to a massive increase in the conflict between educational participation and motherhood for East German women. And, although the rate of entry into first motherhood has recovered in East Germany after 2003, the high and early rate of entry into first motherhood of the GDR was never reached again.

Divorce processes. Chapter Eight has investigated the impact of educational assortative mating on divorce. Our findings indicate that 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. Thus, the question arises how these differences in stability can be explained by the educational match among the spouses? First, our findings show that it is rather the educational gap among the spouses that has a destabilizing effect on women's upward marriages than wife's and husband's education as such. 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 and supports the economic theory of the family. Second, in homogamous marriages, the benefits from division of work are close to zero and the benefits from communication have indeed a stabilizing impact on marriage. Yet, homoga-

mous couples with a higher educational attainment level gain more from this kind of marriage than homogamous couples with a lower educational level. These findings, again, support the economic and sociological theories. Third, 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. Our results both disrupt and confirm previous claims about downward marriage. The economic theory of the family that assumes that the changes for wives and husbands are symmetric and that there are always gains from the division of work for the couple that stabilize the marriage cannot be confirmed. On the contrary, our findings 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, husbands are very likely to compensate this deviation from the norm by adopting traditional gender behaviour elsewhere. As a result, the less educated husband does not engage in housework and his wife increasingly has to struggle with a double burden of work at home and in the labour market which increases the divorce risk. Finally, we have estimated the divorce rate of women with university degree. Even if the divorce rate of married down academic women is much higher than for academic women who are married to an equally educated partner, their divorce rate is still lower than for most of the women who have a lower educational attainment level and marry either educationally up, homogamous or down.

9.2 Implications of Research

After the summary of the major findings of this study, we discuss the implications of our research in this section. The findings have several significant implications for both theoretical approaches and policy makers.

First and foremost, the present study thought to increase our understanding of union formation processes by disentangling not only marriages by the educational match among

the partners but also by doing so for cohabitation. Previous research has shown that women enter increasingly more often into premarital cohabitations rather than directly into marriages. Furthermore, it is argued that, with women's increasing education, there will be more downward cohabitations and marriages. Our analysis clearly showed that there has been no increase in women's downward union formation, which indicates that the norms and values within a society do change very slowly and that women, in a gender-traditional society like Germany, still tend to avoid downward cohabitation and downward marriage. Furthermore, including parent's educational match into an analysis of union formation processes, adds further information to the attempt of explaining union and family formation as well as dissolution processes.

Second, this thesis also clarified some of the discrepancies in earlier studies on educational assortative mating and divorce that are unlikely to be explained only by national differences. In Chapter Eight, we developed a theoretical model and identified three problems of earlier studies: (1) some previous studies only estimated the effects of husband's and wife's education on divorce. Yet, it is quite clear from the literature that not the absolute educational levels of the partners but the relative educational resources within couples are particularly important for the divorce rate. (2) The majority of research that analyses divorce risks assumes traditional marriages when analysing all different kinds of educational marriage matches and, therefore, only studies the disrupting effect of the declining benefits of the division of work when women's educational attainment level has been increasing. Still, based on our theoretical model, there are not only benefits from division of work but also benefits from communication within a couple. Our analysis showed that it is important to analyse divorce risks with regard to 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 various educational matches. In other words, this study was able to clarify some empirical discrepancies in previous research and thus hopes to improve theoretically oriented research on divorce in the future.

Third, this study provided evidence that the pronatalist family and housing policies for mothers in the GDR had a clearly positive effect on women's decision to enter into motherhood during educational enrolment. With the fall of the Wall, the sudden end of these policies has led to a massive increase in East German women's conflict between educational participation and motherhood. As a result, the fertility rate of East German women who were enrolled in education declined abruptly and drastically. Policy makers should therefore not only have a vested interest in easing the problem of women's reconciliation of work and family roles but also in reducing the conflict between full-time education and family demands. To ease women's conflict between family roles and full-time education, the German welfare state should introduce comprehensive measures supporting mothers enrolled full-time in school and training. This is likely to increase fertility as was demonstrated by the GDR. But, in today's 'learning society', this instrument should be very carefully applied because acquiring education is a time-consuming activity that tends to be incompatible with equally time-consuming family related activities. In detail, future policy changes should be directed to the expansion of child-care facilities, the extension of family-oriented benefits, and family-friendly work arrangements for young adults to ease the conflict between work and family demands. This might lower the social risks for young adults by decoupling insecurities with regard to future economic prospects and career opportunities from family formation decisions.

This thesis has shown that women's maturity status and readiness are important dimensions that explain women's postponement of long-term binding decisions such as

marriage and motherhood. This postponement has a direct impact on women's family formation and fertility patterns. It often means that women enter into cohabitation before they marry and that they have fewer children since they are increasingly older when they enter into motherhood for the first time. Being faced with both low fertility and low mortality rates in Germany, a continued decline in fertility will lead to a further decrease of the work force and increasing problems of the social security and pension financing.

Fourth, policy makers should consider the improvement of the legal situation of men who experience fatherhood outside of a marriage due to the increase in cohabiting unions and the dissolution of partnerships. These fathers are still faced with fewer rights of access to their children. As a result, issues of decisions about the everyday life of a child and custody arise that need to be resolved.

9.3 Limitations of the Thesis and Suggestions for Future Research

As with every empirical study, there are always limitations and areas of research that could not be analysed due to data and time constraints. The limitations of this analysis are addressed as implicit recommendations for future research. In this section, we describe five limitations of our research. These are: (1) misreporting of information and methodological issues, (2) lack of information on the partner and the family, (3) replication for men and migrants, (4) selected life course transitions, and (5) spacial and temporal limitations.

1. *Misreporting of information and methodological issues.* The empirical chapters of this thesis rely heavily on retrospective information of the respondents. Potential recall errors with regard to the states, the sequencing of events and the timing of transitions in a respondent's life course are one of the problematic issues. Short-spells and unpleasant experiences (e.g. abortions, miscarriages or unemployment) are more likely to be misreported or omitted by the respondent which creates the problem of underrepresen-

tation. Hence, for future research, it would be useful to improve the interviewing process in retrospective studies, to invest more into data editing and to apply statistical methods of imputation. An even better solution would be to invest more money into the prospective collection of data (as it is indeed done in the NEPS study) because data collection is then less demanding for the autobiographic memory of the respondent. Finally, in many situations where social norms, interpretations and the meaning of concepts are involved, it would be good to complement the quantitative data with qualitative interviews.

As in any empirical study, it would also be beneficial to estimate our models with other independent data sets and additional operationalisations that have not been possible using the NEPS data. Finally, our difference-in-differences analysis is not based on a real experimental design to test the policy interventions. It is only based on a 'natural experiment' and observational data. Future research should think more about experimental designs if policy interventions are introduced. Experimental designs could also be combined with panel studies, such as the NEPS.

2. *Lack of information on income, the partner and the family.* The lack of complete information and the limited number of proxy variables about a woman's income trajectory, her partner and her family of origin is one limitation of our longitudinal study. Since individuals do not make life course decisions in isolation, the omission of 'linked lives' therefore often misses important influences on decision making. For this reason, it would be beneficial to have more detailed partner and family information in future NEPS waves which would allow us to understand family formation decisions and partnership dissolution processes at the level of the couple and the family rather than almost only on the individual level, e.g. partner's income and employment status; women's income or parent's form of union (cohabitation vs. marriage). Finally, it

would be useful to include information on each mother's and daughter's actual view on social norms and values as well as the role of men and women in society into future analyses.

3. *Replication for men and migrants*. Since we can observe a persistent gender-specific division of work in the family and the labour market in Germany (Grunow, 2013), it is still mainly women who have problems to reconcile education, work and family demands. For this reason, we have limited our study only to women. Moreover, we have also excluded women with migration background. Therefore, in the future, we are interested to test whether our results differ for men and migrants.

4. *Selected life course transitions*. This study is restricted on selected life course transitions of women in East and West Germany, namely the birth of a first child as well as first union formation and dissolution. To fully understand family formation processes and union dissolution behaviour of women in Germany, future research could explore e.g. higher number births, repartnering and remarriage, the dissolution of cohabitation as well as the effect of female employment in feminine fields on the combination of work and family and its effect of union stability.However, as we have shown in Chapter Two, these transitions are still very rare in Germany, so that a much bigger data set would be needed to go further into these demographic details.

5. *Spacial and temporal limitations*. By analysing only Germany, we could go deeply into the details of institutional characteristics and historical developments in East and West Germany. However, one could see Germany as a case study in a broader cross-national comparison. In order to see to which extent the German results can be generalized to other countries (e.g. countries that went through similar changes such as East Germany) (Kohn, 1987), we plan to extend our analysis towards other welfare states in the future. For example, we want to compare the German results with countries be-

longing to the liberal, social-democratic or southern European welfare state regime. The Fertility and Family Survey (FFS) (1992), the Generations and Gender Survey (GGS) (2005, 2008/2009) and the European Community Household Panel (ECHP) (1984-2001) are possible data sets do replicate our analysis for other countries in the future. However, these longitudinal data sets are not as recent as the NEPS study. Additionally, our analyses have been limited by the birth cohorts available in our NEPS data set. It is therefore important to keep the spacial and temporal limitations in mind when we think about the generalizability of this study.

Finally, since this thesis has only analysed the developments in Germany until 2010, we are not able to investigate, whether the fertility developments in Germany are affected be the introduction of "Betreuungsgeld" in 2012.

Despite these various limitations, the study contributes several important insights on the family formation and partnership dissolution process of women in East and West Germany. It sheds important light on the dependence of family events on social background, the partner, the historical and institutional context, educational enrolment and attainment level as well as labour market careers. And it remains to be seen, if the cohort fertility forecast for the developed world by Myrskylä, Golrdstein and Cheng (2012) that documents a flattening and even reveral of the cohort fertility comes true. The latest numders on fertility trends show that Germany has the lowest fertility rate in the world (Vöpel & Wolf, 2015).

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A Figures and Tables

A.1 Appendix Chapter 1

Table 9-1: Overview of the exact wording of the question and response rates

Child			Response rate
Child: date of birth (month)	When was <> born? Please tell me the month and the year. ««If the respondent can only remember the child's age, please suggest the corresponding year of birth. If the respondent can only remember the time of year or season, then please enter the following codes accordingly: 21: Beginning of the year/winter, 24: Spring/Easter, 27: Mid-year/summer, 30: Fall, 32: End of the year»»	• January • February • March • April • May • June • July • August • September • October • November • December • *Not determinable*	1.77%
Child: date of birth (year)	When was <> born?	• 1902 • 1954 • 1957 • 1958 • 1956 • 1960 • 1961 • 1962 • 1963 • 1964 • …40 values have been omitted… • 2005 • 2006 • 2007 • 2008 • 2009 • 2010	
Biological, adoptive or foster child	Is <> your biological, adoptive or foster child?	• Biological child • Adoptive child • Foster child • *Refused* • *Don't know*	1.9% 2.89%
Employment			
Job description (ISEI-88)	Let's start with the first job you had <>.	• 16 • 19	

	Please tell me what occupation this was!	• 20 • 21 • 22 • 23 • 24 • 25 • 26 • 27 • …43 values omitted… • 82 • 83 • 85 • 87 • 88 • 90 • Not determined • Refused • Don't know	0.63% 0.11% 1.22%
Permanent contract	Has this position been converted into a permanent employment contract in?	• Yes • No • Position was not temporary • Refused • Don't know	0.04% 0.00%
Job volume at the begin of occupation	Has this position been converted into a permanent employment contract in the period since <>?	• … full-time • … more than half of the regular weekly hours of work • (but less than a whole) • … half of the regular weekly hours of work • … less than half of the regular weekly hours of work • *Missing by design* • *Don't know*	22.20% 0.16%
Partner			
Date when couple moved in together (month)	When did you move in with <> (for the first time)?	• January • February • March • April • May • June • July • August • September • October • November • December • Beginning of the	

		year/winter • Spring/Easter • Mid-Year/Summer • Fall • End of year • *Refused* • *Don't know*	 0.00 0.14
Date when couple moved in together (year)	When did you move in with <> (for the first time)?	• 1950 • 1951 • 1952 • 1953 • 1954 • 1955 • 1956 • 1957 • 1959 • 1960 • …46 values omit-ted… • 2007 • 2008 • 2009 • 2010 • Refused • Don't know	 0.00% 0.05%
Date of marriage (month)	When did you marry your partner <>?	• January • February • March • April • May • June • July • August • September • October • November • December • Beginning of the year/winter • Spring/Easter • Mid-Year/Summer • Fall • End of year • *Refused* • *Don't know*	 0.01% 0.00%
Date of marriage (year)	When did you marry your partner <>?	• 1960 • 1961 • 1962 • 1963 • 1964 • 1965	

		• 1966 • 1967 • 1968 • 1969 • …36 values omitted… • 2006 • 2007 • 2008 • 2009 • 2010 • *Refused* • *Don't know*	 0.01% 0.00%
Date when couple moved out of shared home (month)	Date when couple moved out of shared home?	• January • February • March • April • May • June • July • August • September • October • November • December • Beginning of the year/winter • Spring/Easter • Mid-Year/Summer • Fall • End of year • *Refused* • *Don't know*	 0.12% 0.03%
Date when couple moved out of shared home (year)	Date when couple moved out of shared home?	• 1961 • 1964 • 1966 • 1967 • 1968 • 1969 • 1970 • 1971 • 1972 • 1973 • …34 values omitted… • 2008 • 2009 • 2010 • Not in list • *Refused* • *Don't know*	 0.07% 0.00%

Dat of divorce (month)	When did you (officially) get a divorce?	• January • February • March • April • May • June • July • August • September • October • November • December • Beginning of the year/winter • Spring/Easter • Mid-Year/Summer • Fall • End of year • *Refused* • *Don't know*	 1.24% 0.04%
Date of divorce (year)	When did you (officially) get a divorce?	• 1963 • 1965 • 1966 • 1967 • 1968 • 1969 • 1970 • 1971 • 1972 • 1973 • …33 values omitted… • 2007 • 2008 • 2009 • 2010 • Refused • Don't know	 1.16% 0.04%

A.2 Appendix Chapter 3

Table 9-2 Overview of the covariates in Chapter 3

Label	**Coding**	
Age dependency		Log (age-15.9)
		Log (67.1-age)
Linear cohort trend	1:	Cohort 1944-1953
	2:	Cohort 1954-1963
	3:	Cohort 1964-1973
	4:	Cohort 1974-1986

Place of birth	1:	East Germany
	0:	West Germany (ref.)
Macro structural insecurity		Annual unemployment rate, separately for East and West Germany, from 1960 to 2010
Period 1960-1969 (ref.)	1:	Period 1960-1969
	0:	Period before 1960 and after 1969 (ref.)
Period 1970-1979	1:	Period 1970-1979
	0:	Period before 1970 and after 1979 (ref.)
Period 1980-1989	1:	Period 1980-1989
	0:	Period before 1980 and after 1989 (ref.)
Period 1990-1999	1:	Period 1990-1999
	0:	Period before 1990 and after 1999 (ref.)
Period 2000-2010	1:	Period 2000-2010
	0:	Period before 2000
Enroled in education	1:	Enroled full-time in education
	0:	Not enroled in education (ref.)
Educational attainment level	8:	No degree
	9:	Lower secondary school qualification without vocational training
	10:	Middle school qualification without vocational training
	11:	Lower secondary school education with vocational training
	12:	Middle school qualification with vocational training
	13:	Abitur
	15:	Abitur with vocational training
	16:	University of applied sciences degree
	18:	University degree
No child (ref.)	1:	No child
	0:	At least one child or pregnant (ref.)
First pregnancy	1:	Pregnant with first child
	0:	Not pregnant with first child (ref.)
Second pregnancy	1:	Pregnant with second child
	0:	Not pregnant with second child (ref.)
First child	1:	One child
	0:	No child or more than one child (ref.)
At least two children	1:	At least two children
	0:	No child or one child (ref.)

Source: Own representation based on NEPS data from the adult study

A.3 Appendix Chapter 4

Table 9-3 Overview of the covariates in Chapter 4

Label	Coding	
Up to 1 year (ref.)	1:	Duration of up to 1 year
	0:	Duration longer than 1 year (ref.)
1-2 years	1:	Duration between 1-2 years
	0:	Duration of less than 1 and more than 2 years (ref.)
2-3 years	1:	Duration between 2-3 years
	0:	Duration of less than 2 and more than 3 years (ref.)
3-4 years	1:	Duration between 3-4years
	0:	Duration of less than 3 and more than 4 years (ref.)
4-5 years	1:	Duration between 4-5 years
	0:	Duration of less than 4 and more than 5 years (ref.)
5-6 years	1:	Duration between 5-6 years
	0:	Duration of less than 5 and more than 6 years (ref.)
6-7 years	1:	Duration between 6-7 years
	0:	Duration of less than 6 and more than 7 years (ref.)
7-8 years	1:	Duration between 7-8 years
	0:	Duration of less than 7 and more than 8 years (ref.)
8-9 years	1:	Duration between 8-9 years
	0:	Duration of less than 8 and more than 9 years (ref.)
10 or more years	1:	Duration of 10 or more years
	0:	Duration of less than 10 years (ref.)
Early cohabitation	1:	Younger than 21 years at entry into cohabitation
	0:	At least 21 years at entry into cohabitation (ref.)
Late cohabitation	1:	At least 21 years at entry into cohabitation
	0:	Younger than 21 years at entry into cohabitation (ref.)
Place of birth	1:	East Germany
	0:	West Germany (ref.)
Macro structural insecurity		Annual unemployment rate, separately for East and West Germany, from 1960 to 2010
Period 1960-1969 (ref.)	1:	Period 1960-1969
	0:	Period before 1960 and after 1969 (ref.)
Period 1970-1979	1:	Period 1970-1979
	0:	Period before 1970 and after 1979 (ref.)
Period 1980-1989	1:	Period 1980-1989
	0:	Period before 1980 and after 1989 (ref.)
Period 1990-1999	1:	Period 1990-1999
	0:	Period before 1990 and after 1999 (ref.)
Period 2000-2010	1:	Period 2000-2010
	0:	Period before 2000
Macro structural insecurity		Annual unemployment rate, separately for East and West Germany, from 1960 to 2010
Educational attainment level	8:	No degree
	9:	Lower secondary school qualification without vocational training
	10:	Middle school qualification without vocational training
	11:	Lower secondary school education with vocational training
	12:	Middle school qualification with vocational training
	13:	Abitur
	15:	Abitur with vocational training
	16:	University of applied sciences degree
	18:	University degree
Enroled in education	1:	Enroled full-time in education
	0:	Not enroled in education (ref.)

Woman > man	1:	Woman has a higher educational attainment level than man
	0:	Woman has not a higher educational attainment level than man (ref.)
Woman = man (ref.)	1:	Woman has the same educational attainment level as the man
	0:	Woman has not the same educational attainment level as the man (ref.)
Woman < man	1:	Woman has a lower educational attainment level than man
	0:	Woman has not a lower educational attainment level than man (ref.)
No child (ref.)	1:	No child
	0:	At least one child or pregnant (ref.)
First pregnancy	1:	Pregnant with first child
	0:	Not pregnant with first child (ref.)
Second pregnancy	1:	Pregnant with second child
	0:	Not pregnant with second child (ref.)
First child	1:	One child
	0:	No child or more than one child (ref.)
At least two children	1:	At least two children
	0:	No child or one child (ref.)

Source: Own representation based on NEPS data from the adult study

A.4 Appendix Chapter 5

Table 9-4 Overview of the covariates in Chapter 5

Label	Coding	
Age dependency		Log (age-15.9) Log (67.1-age)
Place of birth	1:	East Germany
	0:	West Germany (ref.)
Macro structural insecurity		Annual unemployment rate, separately for East and West Germany, from 1960 to 2010
Linear cohort trend	1:	Cohort 1944-1953
	2:	Cohort 1954-1963
	3:	Cohort 1964-1973
	4:	Cohort 1974-1986
Period 1960-1969 (ref.)	1:	Period 1960-1969
	0:	Period before 1960 and after 1969 (ref.)
Period 1970-1979	1:	Period 1970-1979
	0:	Period before 1970 and after 1979 (ref.)
Period 1980-1989	1:	Period 1980-1989
	0:	Period before 1980 and after 1989 (ref.)
Period 1990-1999	1:	Period 1990-1999
	0:	Period before 1990 and after 1999 (ref.)
Period 2000-2010	1:	Period 2000-2010
	0:	Period before 2000
Educational attainment level	8:	No degree
	9:	Lower secondary school qualification without vocational training
	10:	Middle school qualification without vocational training
	11:	Lower secondary school education with vocational training
	12:	Middle school qualification with vocational training
	13:	Abitur
	15:	Abitur with vocational training
	16:	University of applied sciences degree
	18:	University degree
Enroled in education	1:	Enroled full-time in education
	0:	Not enroled in education (ref.)
Mother > father	1:	Mother has a higher educational attainment level than father
	0:	Mother has not a higher educational attainment level than father (ref.)
Mother = father (ref.)	1:	Mother has the same educational attainment level as the father
	0:	Mother has not the same educational attainment level as the father (ref.)
Mother < father	1:	Mother has a lower educational attainment level than father
	0:	Mother has not a lower educational attainment level than father (ref.)
No child (ref.)	1:	No child
	0:	At least one child or pregnant (ref.)
First Pregnancy	1:	Pregnant with first child
	0:	Not pregnant with first child (ref.)
At least one child	1:	At least one child
	0:	No child and not pregnant (ref.)

Source: Own representation based on NEPS data from the adult study

A.5 Appendix Chapter 6

Table 9-5: Overview of the covariates in Chapter 6

Label	Coding	
Age dependency		Age
		Age*Age
Place of birth	1:	East Germany
	0:	West Germany (ref.)
Education	8:	No degree
	9:	Lower secondary school qualification without vocational training
	10:	Middle school qualification without vocational training
	11:	Lower secondary school education with vocational training
	12:	Middle school qualification with vocational training
	13:	Abitur
	15:	Abitur with vocational training
	16:	University of applied sciences degree
	18:	University degree
Social origin (father's educational attainment level)	8:	No degree
	9:	Lower secondary school qualification without vocational training
	10:	Middle school qualification without vocational training
	11:	Lower secondary school education with vocational training
	12:	Middle school qualification with vocational training
	13:	Abitur
	15:	Abitur with vocational training
	16:	University of applied sciences degree
	18:	University degree
Historical periods	1:	Period from 1990
	0:	Period until 1990 (ref.)
Marital status	1:	Married
	0:	Not married (ref.)

Source: Own representation based on NEPS data from the adult study

A.6 Appendix Chapter 7

Table 9-6: Overview of the covariates in Chapter 7

Label	Coding	
Age dependency		Log (age-15.9)
		Log (45.1-age)
Place of birth	1:	East Germany
	0:	West Germany (ref.)
Period until 1990 (ref.)	1:	Period until 1990
	0:	Period after 1990 (ref.)
Period from 1991 till 2002	1:	Period from 1991 till 2002
	0:	Period before 1991 and after 2002 (ref.)
Period from 2003	1:	Period from 2003
	0:	Period until 2003 (ref.)
Macro structural insecurity		Annual unemployment rate, separately for East and West Germany, from 1960 to 2010
Educational attainment level	8:	No degree
	9:	Lower secondary school qualification without vocational training
	10:	Middle school qualification without vocational training
	11:	Lower secondary school education with vocational training
	12:	Middle school qualification with vocational training
	13:	Abitur
	15:	Abitur with vocational training
	16:	University of applied sciences degree
	18:	University degree
Enroled in education	1:	Enroled full-time in education
	0:	Not enroled in education (ref.)
Social background (father's educational attainment level)	8:	No degree
	9:	Lower secondary school qualification without vocational training
	10:	Middle school qualification without vocational training
	11:	Lower secondary school education with vocational training
	12:	Middle school qualification with vocational training
	13:	Abitur
	15:	Abitur with vocational training
	16:	University of applied sciences degree
	18:	University degree
Fertility pressure		Variable that increases linearly with increasing age
Career resources		ISEI prestige score
Full-time employed (ref.)	1:	Full-time employed
	0:	Not full-time employed (ref.)
Part-time employed	1:	Part-time employed
	0:	Not part-time employed (ref.)
Unemployed	1:	Unemployed / not employed
	0:	Not unemployed/ not employed (ref.)
Type of employment contract	1:	Temporary contract
	0:	Permanent contract (ref.)
Marital status	1:	Married
	0:	Not married (ref.)

Source: Own representation based on NEPS data from the adult study

A.7 Appendix Chapter 8

Table 9-7: Overview of the covariates in Chapter 8

Label	Coding	
0-1	1:	Duration of up to 1 year
	0:	Duration longer than 1 year (ref.)
2-3	1:	Duration between 2-3 years
	0:	Duration of less than 2 and more than 3 years (ref.)
4-5	1:	Duration between 4-5 years
	0:	Duration of less than 4 and more than 5 years (ref.)
6-7	1:	Duration between 6-7years
	0:	Duration of less than 6 and more than 7 years (ref.)
8-10	1:	Duration between 8-10 years
	0:	Duration of less than 8 and more than 10 years (ref.)
11-15	1:	Duration between 11-15 years
	0:	Duration of less than 11 and more than 15 years (ref.)
16-20	1:	Duration between 16-20 years
	0:	Duration of less than 16 and more than 20 years (ref.)
20+	1:	Duration of 20 and more years
	0:	Duration of less than 20 years
Place of birth	1:	East Germany
	0:	West Germany (ref.)
1944-1950 (ref.)	1:	Born between 1944 and 1950
	0:	Born after 1950 (ref.)
1951-1960	1:	Born between 1951 and 1960
	0:	Born before 1951 or after 1960 (ref.)
1961-1970	1:	Born between 1961 and 1970
	0:	Born before 1961 or after 1970 (ref.)
1971-1980	1:	Born between 1971 and 1980
	0:	Born before 1971 or after 1980 (ref.)
Period until 1990 (ref.)	1:	Period until 1990
	0:	Period after 1990 (ref.)
Period after 1990	1:	Period after 1990
	0:	Period before 1990 (ref.)
Women's premarital cohabitation	1:	Cohabitated with husband prior to marriage
	0:	Did not cohabit with husband prior to marriage (ref.)
Women's pregnancy at marriage	1:	Is pregnant at the time of marriage
	0:	Is not pregnant at the time of marriage (ref.)
Women's premarital birth	1:	Did give birth before marriage
	0:	Did not give birth before marriage (ref.)
Early marriage	1:	Woman's age at entry into first marriage is under 23
	0:	Woman's age at entry into first marriage is over 23 (ref.)
Late marriage (ref.)	1:	Woman's age at entry into first marriage is over 23
	0:	Woman's age at entry into first marriage is under 23 (ref.)
Wife older than husband	1:	Wife is 2 years or more older than her husband
	0:	Husband is older than wife (ref.)
Wife and husband are of the same age (ref.)	1:	Wife is of the same age as her husband or up to 2 years younger
	0:	Husband is of the same age as wife or up to 2 years older (ref.)
Wife younger than husband	1:	Wife is younger than husband
	0:	Wife is not younger than husband (ref.)
Education of the wife at marriage	8:	No degree
	9:	Lower secondary school qualification without vocational training
	10:	Middle school qualification without vocational training
	11:	Lower secondary school education with vocational training
	12:	Middle school qualification with vocational training

Continuation of Table 9-7

	13:	Abitur
	15:	Abitur with vocational training
	16:	University of applied sciences degree
	18:	University degree
Education first husband	8:	No degree
	9:	Lower secondary school qualification without vocational training
	10:	Middle school qualification without vocational training
	11:	Lower secondary school education with vocational training
	12:	Middle school qualification with vocational training
	13:	Abitur
	15:	Abitur with vocational training
	16:	University of applied sciences degree
	18:	University degree
Homogamous (ref.)	1:	Spouses have the same educational attainment level
	0:	Spouses do not have the same educational attainment level (ref.)
Heterogamous	1:	Spouses do not have the same educational attainment level
	0:	Spouses have the same educational attainment level (ref.)
Education of the spouses at first marriage	1:	Lower secondary and intermediate schooling without vocational training
	2:	Lower secondary and intermediate schooling with vocational training
	3:	University of applied sciences degree
	4:	University degree
Educational gap between the spouses	1:	The educational difference between the spouses is 1 with regard to the educational classification above
	2:	The educational difference between the spouses is 2 with regard to the educational classification above
	3:	The educational difference between the spouses is 3 with regard to the educational classification above
Wife married down	1:	Wife has a higher educational attainment level than her husband
	0:	Wife does not have a higher educational attainment level than her husband (ref.)
Wife married homogamous (ref.)	1:	Wife has the same educational attainment level than her husband
	0:	Wife does not have the same educational attainment level than her husband (ref.)
Wife married up	1:	Wife has a lower educational attainment level than her husband
	0:	Wife does not have a lower educational attainment level than her husband (ref.)

Source: Own representation based on NEPS data from the adult study