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Differences in Fertility Patterns between East and West German Women

Disentangling the roles of cultural background and of the transformation process

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Abstract: The present study compares parity-specific fertility patterns of West and East German women (from birth cohorts 1970 and younger) after German re-unification using panel data from the GSOEP (waves 1990 through 2006). Whereas the transition rate for the birth of the first child tends to be higher in the East German than in the West German sub-sample, the likelihood of second births remains considerably higher among West German women across time. The analyses presented comprise a detailed comparative test of different intervening mechanisms, represented by sociocultural orientations and social inequalities resulting from the societal transformation process. Although the transition rate to first births among East German women is lowered by their higher education and work aspirations, their higher degree of family orientation promotes their propensity to start a family. Surprisingly, the higher proportion of persons without a denomination in East Germany promotes the transition to parenthood because it accelerates both the engagement in and the consolidation of intimate relationships. The lower transition rate to second births among East German women is partly accounted for by the higher work aspirations, by the lower religiosity and by the lower general life satisfaction in this subgroup.

Keywords: fertility · Eastern Germany · family formation · second birth

1 Introduction

Birth and fertility rates are quite vivid indicators of a society's capacity to regenerate and maintain itself. This may be why mass media and authors of popular scientifc literature sporadically turn their attention to the stagnating birth rates in Germany. On the basis of aggregate statistics, such as the total fertility rate, Germany has one of the lowest birth rates among European countries (*Dorbritz* 2000). This view,

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however, neglects the complexity and dynamics of fertility patterns, particularly in East Germany after unification.

At a first glance, the East German "birth slump" and the slow increase in birth rates later on, as shown by a comparison of descriptive fertility rates in East and West Germany, might be interpreted as a "birth shock" followed by convergence. However, this interpretation does not take into account the fact that women who were raised in East and West Germany, respectively, are likely to represent different subpopulations. The two groups can be expected to diverge from each other considerably with regard to cultural traditions, as well as in the way in which they experienced the situation after reunification. Due to the radical transformation of the political system in East Germany and largely unchanged living conditions in West Germany, German unification represents a historically rare setting. Within this framework, the fertility patterns of women who were socialized in East Germany being in their fertile phase after the system change, may reflect habits that are typical of the pre-unification period, combined with the economic and biographical uncertainties caused by the transformation process.

Up to now, factors underlying the different fertility patterns in East and West Germany have not been studied systematically. Hence, the present study aims at empirically investigating the ways in which the fertility patterns of East and West German women (analysed separately for first and second parity) differ in post-reunification times. In a first step, and based on recent longitudinal data from the German Socio-Economic Panel (SOEP), we analyse the trajectories of fertility patterns in the East and West German sub-samples between 1990 and 2006. Secondly, by using path models we examine in greater detail the roles played by various factors underlying this fertility differential. Specifically, we analyse the influence exerted by divergent value orientations acquired during socialization (e.g. the higher occupational orientation of East German women). Additionally, we test the degree to which the differing family patterns reflect the consequences of the transformation process in the shape of biographical and economic uncertainties in East Germany.

The present article is structured as follows: Firstly, existing research with regard to parity-specific differences in fertility patterns between women from East and West Germany, respectively, will be discussed (section 1.1). The next step is to extract the vital differences between East and West German women concerning characteristics influencing fertility following a historical perspective (section 1.2). On the basis of the considerations outlined, hypotheses to explain the differences in fertility patterns between East and West German women will be generated, explicitly taking into account the intervening variables which were previously identified (section 1.3). The methodological approach (section 2), the results of the analyses (section 3), as well as a theoretical discussion of the results (section 4), will be presented in the following part.

1.1 Current State of Research on East and West German Fertility Patterns

When studying the comparison of East and West German fertility patterns, the parity specificity reported in the literature has to be taken into account (*Kreyenfeld* 2003). Previous life course studies dealing with the transition to parenthood have reached the conclusion that East German women born after 1971 (whose fertile period mainly spans post-reunification years) postpone family formation to a higher age, whereas the cohorts of West German women do not exhibit a significant shift in fertility behaviour (*Kreyenfeld* 2006; *Kreyenfeld/Huinink* 2003). Even though they have delayed their first births, younger East German women still opt for parenthood somewhat earlier than West German women (*Kreyenfeld* 2003); who continue to exhibit a relatively high average age at first birth (*Kreyenfeld* 2006). *Kreyenfeld* (2000) states that these differences for the cohorts 1961-70 and 1971-80 are statistically significant. Altogether, the available evidence suggests that the likelihood of family formation has been higher among East German than among West German women since unification.

As for the transition to second birth, in the pre-unification decade, East German women were characterized by a slightly lower transition rate compared to West German women; this gap has considerably widened after reunification (*Kreyenfeld/Huinink* 2003; *Kreyenfeld/Mika* 2006). *Dornseiff* and *Sackmann* (2003) have shown that this difference in the likelihood of second births is statistically significant for all the age cohorts studied (1952-1980).

As regards the central differences between East and West Germans with respect to fertility patterns (namely, transition to first and second births) after unification, we can conclude that East German women, at least those from younger cohorts, have shown (at least) a postponement of fertility decisions in the post-unification decade. As to the resulting differences in fertility levels, the findings remain somewhat inconclusive due to the right-censoring of the data analysed in previous studies.[1] The reported results for West German women can be subsumed in a "polarization thesis" (*Huinink* 1995b: 199), according to which family formation processes are increasingly narrowed down to two alternatives: childlessness or two children. In East Germany, however, the one-child family seems to enjoy comparatively greater popularity.

So far, only a limited number of studies have been carried out in order to actually explain the differences between East and West German fertility behaviour described above. *Hank et al*. (2004) reports that the availability of childcare facilities has a positive effect on the transition to first birth in East Germany. As to the transition to second births, *Dornseiff* and *Sackmann* (2003) state that the positive coefficient for West Germany is insignificant in multivariate terms once a number of

1 In view of the limited time frame of the fertile period, it may be assumed that not all postponed births will actually be caught up later.

covariates (e.g., type of partnership and religiousness) are controlled for. However, since all variables are entered into the model in one step, it remains unclear which predictors primarily account for the different transition rates to the second child in East vs. West Germany.

Almost all previous studies analyzing fertility determinants across East and West German subpopulations compute two separate event history models (East vs. West Germans) (one important exception being the study by *Dornseiff/Sackmann* 2003 already cited). It remains unclear within this analytical framework whether the differences that have been observed can be traced back to systematic differences in the composition of the two subpopulations (e.g. differing distributions of relationship types or religious denominations). This is why we have chosen a slightly different model specification for our analyses. In order to examine differences in fertility behaviour between our East and West German subsamples, the hypotheses are tested by computing combined models for the whole sample (including both East and West German women) with a dummy indicator for "East vs. West German". The procedure proposed here, i.e. modeling socio-structural indicators and attitudes relevant to fertility as endogenous variables, is indispensable for testing whether already known differences in social characteristics of East and West Germans are actually responsible for the diverging fertility patterns.

1.2 Historical Roots of Differences in the Structure of the Population

Below, we use a socio-historic approach to identify origins and chronological trends in fertility determinants, comparing the East and West German subpopulations. Three different layers of differences between East and West Germany may be distinguished:

1. Long-lasting cultural differences: East Germany comprises the Protestant, more secular North-East of Germany, where the institutionalization of families shows many similarities to Scandinavian societies, as does the acceptance of "social democratic" family policy. West Germany, by contrast, was very much influenced by the Catholic South, placing a strong emphasis on the principle of "subsidiarity", reliance on the self-help patterns of kinship networks, and preference for non-interference by the State in family matters (cf. *Bertram* 1996).
2. Intermediate influences of belonging to two different political systems for decades: The differences between the two cultures may have been further enhanced by the contrasting political systems of the GDR and the FRG, with a strong system of incentives towards fertility, on the one hand, and an array of rather indirect, sometimes even self-contradictory family-related policies on the other.
3. Short-term effects of East Germany's political transformation, reflected by the far-reaching substitution of social institutions. These transformations resulted in shock-like perceptions of economic and social instability immediately after political unification.

Since cultural and political differences are intricately interwoven and are virtually impossible to disentangle in terms of their effects on fertility behaviour immediately after political unification, both aspects are dealt with simultaneously. However, it would be short-sighted to attribute the behavioural differences between individuals from both sides to the political differences alone: The gender-based division of labour and resulting interdependence in the family, and the institutionalization of marriage, is as deeply culturally rooted in the South-West as is the independent position of women, their inclusion in the labour force, the secondary role played by marriage, the State's responsibility for individual welfare in the North-East (*Bertram* 1996). Accordingly, most of the differences between these parts of Germany existed long before the establishment of the two political systems after the Second World War, and were subsequently enhanced by the, in some respects, mutually-antagonistic social and family policies. For example, the proportion of individuals with no religious affiliation was already higher in East Germany before the establishment of the GDR, gained prevalence during its existence, and increased even further after political unification. Also, the propensity for extramarital births was already high before the GDR, increased steadily during its existence, and rose sharply after political unification (*Konietzka/Kreyenfeld* 2005), whereas the higher level of the inclusion of mothers from the labour force before and during GDR times dropped sharply after unification – not because of changing preferences, but because of receding opportunities (*Adler* 2004).

Marriage and the family as the "basic elements" of society were a crucial rhetoric component of socialist ideology in the GDR (*Gysi* 1989: 10). The social and family policies of the GDR regime met this standard inasmuch as considerable monetary and structural incentives were established in favour of family formation (*Kreyenfeld* 2004). *Schneider et al*. (1995: 2) estimate that, in that period, the State used to bear about 85 per cent of total child-related costs. Hence, scientists postulate in the literature on the welfare state that the comparatively high fertility rate in the GDR can be primarily attributed to windfall gains (*Huinink* 1995a). The "model: employed mother" (*Gysi/Meyer* 1993) was predominant as a social norm, emanating from the possibility to simultaneously reconcile motherhood and employment. It is widely known that the GDR regime was acting under serious economic pressure stemming from the low productivity of the centrally-planned economy, as well as from massive waves of emigration in the 1950s. Hence, the political leadership was forced to offer women the opportunity to return to the labour market immediately after a child was born in order to take advantage of their labour force. Actually, the publicly-preached concept of an egalitarian gender model largely appears to be a romantic illusion (*Dannenbeck et al.* 1995). A culture of full-time employment among women nonetheless developed in the GDR, in contrast to most contemporary Western countries (*Dornseiff/Sackmann* 2003). In fact, this culture was not restricted to childless women or women with older children, and it was definitely accepted by men. A tightly-meshed network of childcare facilities simultaneously provided the infrastructure needed to implement this model. Consequently, family formation was a normative biographical element for most East Germans: *Schneider* (1994: 138) provides estimates according to which 20 – 25 per cent of West German

women remained childless at the end of the 1980s, whereas fewer than 10 per cent of East German women were permanently childless.

An important facilitating factor for fertility decisions was the high degree of biographical security and predictability in the GDR (*Bertram* 1995: 269). This exacerbated the impact of the far-reaching loss of biographical and material security related to the system change. Previously unknown problems such as mass unemployment and increasingly precarious employment relationships then emerged. These socio-economic consequences of the transformation process interfered with the long-term planning of people's own lives and made children a financial risk factor (*Dorbritz/Schwarz* 1996; *Kreyenfeld* in press). Early demographic studies interpreted the abrupt changes in aggregate total fertility rates (TFR) after reunification as a reflection of these shock-like transformations (*Eberstadt* 1994; *Witte/Wagner* 1995). According to *Gerlach* and *Stephan* (2001), economic problems are partly responsible for the lower life satisfaction in East Germany after the changes. Various empirical studies indicate that the gap between East and West Germany with respect to income and other aspects of the standard of living, but also as to overall satisfaction with life, has diminished since unification; however, a complete leveling has not yet been accomplished (*Geißler* 2006: 77; *Gerlach/Stephan* 2001). This may have contributed to a convergence of East and West German fertility patterns after reunification.

Taking the socialization patterns in the GDR into account, a number of additional, unintended side effects of socialist propaganda can be observed, which may have thwarted all pronatalist policies in a subtle way. The socialist regime's disapproval of and sanctions against religious activities considerably restrained the proliferation of denominational affiliations as well as of religious activities, hence exerting a decisive normative influence on the denominational composition of the population (*Pollack* 1998). The marginal role of religion has been fuelled by the lack of a traditional "Catholic culture" in East Germany (*Pickel* 2003). Previous studies find no evidence of a revitalization of religiosity in East Germany after reunification; in the course of the general secularization process, in fact, a further decline of denominational commitment can be observed in the new federal states (*Pickel* 2003; *Pollack/Pickel* 2003). In view of these sustained discrepancies, a harmonization of fertility patterns cannot be expected to occur in the short term.

Additionally, the comparatively low normative value of marriage as an institution, also reflected by elevated divorce rates during the GDR period, may have contributed to the relatively low likelihood of East German couples to marry (*Huinink* 1999). Although the normative and empirical association between marriage and parenthood is traditionally weaker in East Germany than in West Germany (*Konietzka/Kreyenfeld* 2005), the larger number of unmarried couples, as well as the limited denominational and religious commitment, respectively, might still exercise a general dampening effect on fertility (*Huinink/Konietzka* 2003).

Unlike in the GDR, family policy in the FRG has never striven to achieve overtly pronatalist goals. For a long period, social and family policy has focused on marriage, which almost automatically included children (*Diene*l 2002: 21). The privacy of marriage and the family, as well as their status as autonomous institutions, were

generally respected; the State largely abandoned measures to actively stimulate family formation, confining its role to a passive protective position (*Schneider et al.* 1995: 9). Direct monetary or structural incentives for family formation comparable to those in the GDR were not established.

In contrast, child-oriented motives towards marriage have been traditionally predominant in West Germany (*Huinink/Konietzka* 2003; *Schneider* 1994: 187). Additionally, regulations in tax legislation introduced in the 1950s (particularly the so-called "Ehegattensplitting", a tax system geared to the combined income of husband and wife) provided rewards for a traditional division of labour in marriage: The wider the income gap grows, the greater are the resulting financial gains for married couples (*Dienel* 2002: 87ff). Moreover, there has been a chronic shortage of childcare facilities, particularly crèches and full-time schools. Thus, it may be interpreted as a logical consequence that West German women predominantly adhere to the sequential model of combining family and employment according to which women follow a life course pattern of alternating stages of employment and childcare.

When it comes to values and attitudes, these structural conditions correspond to the prevalent skepticism of public childcare and employment of women: Even in the mid-1990s, East and West Germany were still at the opposite ends of the European continuum concerning to acceptance of employment of mothers with preschool children (*Treas/Widmer* 2000). As regards more recent developments, studies have provided evidence that the occupational orientation among East and West German women has not yet completely converged. The employment rate of East German women in 2007 was significantly higher than that of West German women (*Federal Statistical Office* 2008: Table 4.5).

As for the GDR, another attitude became apparent that was obviously unintended by the political protagonists: Despite (or even because of) the regime's efforts to keep citizens under permanent and comprehensive surveillance, the population apparently developed a strong family orientation (*Huinink* 1995a: 39). Some authors argue that the State's intrusion into people's privacy made the population shift the focus of their lives from the public political domain to privacy within the family. Paradoxically, the regime's attempts to intrude into citizens' private lives instead led to an unintended revaluation of family life. It thus stimulated the desire for a kind of individual "counter-world", a hideaway within the surveillance society. After all, the consequences of the transformation process on family values are ambiguous. On the one hand, it can be assumed from the life course perspective that the biographical and economic impact caused by the transformation has resulted in increased tension and conflicts in the family (*Elder/Caspi* 1990: 29), which, in turn, might have reduced family orientations. In accordance with *Schelsky's* (1953) studies on changes in families after the Second World War, it may be hypothesized, on the other hand, that cohesion and commitment within the family served as resources that helped to ease the negative impacts of unification (*Franz/Herlyn* 1995: 93).

In summary, it may be assumed that, on the one hand, the East and West German subpopulations still differ significantly in their composition (e.g. denominational affiliations, empirical associations between marriage and parenthood, etc.),

as well as in their socio-cultural orientations (work and family orientation of women, religiosity) and, on the other hand, in the sustained impact of the transformation.

1.3 Hypotheses Concerning Differences in Fertility Patterns between East and West German Women

Considering existing research on parity-specific fertility differentials between East and West German women after reunification, we first expect differing family patterns:

1. East German women exhibit a higher likelihood of first births, but a lower likelihood of second births, in the post-unification period.

Further hypotheses concern the impact of differing socialization experiences of East and West German women, as well as effects of the societal transformation processes on parity-specific fertility patterns. Decreased opportunities on the labour market and uncertainties in biographical options after political unification have lowered life satisfaction and reduced the household incomes of East German women. Because both income and satisfaction with life are expected to raise fertility,[2] the following hypothesis is formed:

2. The consequences of the transformation process outlined above have exerted an inhibiting effect on the fertility behaviour of East German women.

Furthermore, we expect a high degree of continuity with regard to the socio-cultural characteristics of the East and West German subpopulations which may be partly responsible for the different fertility patterns. Educational level has been found to inhibit the transition to parenthood, but to increase the likelihood of a second birth. Occupational orientation is expected to exert a negative impact on fertility, irrespective of parity:

3. The transition to first and second births is reduced among East German women due to their stronger occupational orientation.
4. The higher level of education among East German women decreases their likelihood of first births but increases the transition rate to second births.

Existing research indicates a generally positive effect of family orientation towards fertility:

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2 There might be a non-linear association between income and fertility because of a positive price effect in low-income groups and a negative effect in high-income groups due to substitution of quality for quantity of children (*Becker* 1973).

5. The transition rate to first and second births is increased among East German women due to their stronger family orientation.

The empirical literature suggests that the impact of religion on fertility may be ambiguous. Although religious commitment raises fertility among married couples, it may delay their time until marriage. We thus examine the following research question:

How does weaker denominational commitment and lower religiosity impact the relative likelihood of first and second births for East German women?

2 Data and Approach

2.1 Dataset and Analyses

Existing studies on fertility patterns in East and West Germany after unification have been based on the analysis of retrospective survey data which either do not contain information on subjective preferences and values, or the available information is measured retrospectively for subjects who have already become mothers. In identifying causal effects, the panel approach is superior inasmuch as the collection of covariate data is supposed to take place prior to the occurrence of the event. For that reason, we utilize data of the German Socio-Economic Panel (SOEP, samples A-E, waves G-W (including Z), 1990-2006), a panel survey that started in West Germany in 1984 and in East Germany in 1990, with subsequent waves conducted annually. Beyond socio-demographic standard indicators, the SOEP also contains data on attitudes, such as work aspirations and family orientation or religiosity, which is crucial for our research problem. We are not aware of any other published study on the topic that is based on more recent data.

It should be noted that there are major differences between event history analyses based on retrospective and panel data in terms of sample composition. Using panel data, the period of observation refers to historical time intervals (in our case, from 1990 to 2006), whereas in a retrospective design a life course perspective is adopted (i.e. following individuals from the beginning of process time). As a consequence, panel samples partly consist of respondents who have been at risk for a prolonged period of time prior to the first panel wave without experiencing the event (left truncation, see *Guo* 1993). In order to reduce the degree of left truncation as far as possible and to increase comparability with existing research, the sample comprises 17- to 36-year-old women of birth cohorts 1970 and younger who were either childless (analysis of first birth) or who already had one child (analysis of

second birth) in 1990, or at the beginning of the observational period, respectively.[3] The resulting sample contains women in non-marital and marital unions who do or do not share a household with their partners. To avoid potential selection bias, persons who did not have a partner at the time of the interview were also included in the sample.

We analyse the transition to first and second births by utilizing discrete-time event history analysis based on conditional likelihoods (e.g. *Singer/Willett* 2003), which is particularly appropriate for panel data (*Guo* 1993). Within this framework, the dependent variable is binary and indicates whether the event of interest does or does not occur between two panel observations. The central concept of event history analysis is the transition rate, which, in the discrete-time case, may be interpreted as the conditional probability of a change of state at time t (Pr), provided that the observation units belong to the risk set until time t (T = t), i.e. that no event has been observed for them so far.

We thus use a multi-spell model in which subjects are defined to be at risk until the dependent event or right-censoring occurs. The data are arranged in such a way that each year of observation represents a single episode (so-called person years). The risk period comprises a maximum of seventeen panel waves (1990-2006). For instance, if a woman does not give birth to a child in seventeen subsequent waves, the dataset contains seventeen right-censored person years (rows). The period of observation ends in case of a first or second birth, respectively, or of right-censoring (or panel attrition). Table 1 shows the resulting sample sizes and the number of births observed (after listwise deletion of missing cases).

Tab. 1: Sample size and number of births observed (17- to 36-year-old women of birth cohorts beginning in 1970)

	West German subsample	East German subsample	Total
		n	
Childless women	1550	645	2195
Women with one child	611	263	874
		Number of birth events	
First births	373	149	522
Second births	266	72	338

Source: SOEP (Waves G-W, 1990-2006, own calculations)

[3] In order to completely avoid the left truncation of data (i.e. observing respondents from age 15 onwards), in the chosen period of observation it would be mandatory to restrict the analyses to birth cohorts since 1975 which would have led to an insufficient number of observations. The analytical trade-off between a sufficient sample size and comparability to existing life course studies chosen here was to include birth cohorts since 1970.

A standard probit regression model is used in order to estimate the effects of covariates on the transition rate. It contains the duration of remaining in the initial state (indicated by age) as a covariate. In the tables, unstandardized regression (b) coefficients are displayed. Accordingly, positive (negative) coefficients indicate a positive (negative) effect of the covariate on the transition rate.

This paper focuses on the roles that various intervening variables (e.g. education and religiosity) play with respect to the effect of the characteristic "West vs. East German" on the transition rates to first and second births. The literature distinguishes between two data constellations in such a framework: mediation and suppression (cf. *MacKinnon et al.*2000). The direct effect of a predictor X (here: West vs. East German) on the dependent variable Y (here: transition rate) may either rise (suppression) or diminish (mediation) after a control variable Z (here: distinct social characteristics of East and West Germans determining fertility) is introduced into the model. The indirect effect of X on Y, mediated by Z, is calculated as the product of the two direct effects (X → Z and Z → Y). In case of mediation, the direct effect of X on Y has the same algebraic sign as the indirect effect; in case of suppression, the signs of the direct and the indirect effects are different.

In the standard hierarchical regression procedure, the indirect effect is usually inferred from the change in the coefficient for the effect X → Y after multivariately controlling for potential intervening variables. Since this procedure does not yield a statistical test of mediation or suppression, we compute additional path models (from the same dataset) based on the empirical covariance matrix of the model variables (for an introduction to covariance structure analysis, see *Reinecke* 2005). These path models were computed with the Mplus software (*Muthén/Muthén* 2007) and yield coefficients that are virtually identical to conventional event history analysis; however, they also provide additional information concerning the statistical significance of the effects X → Z and, therefore, of the corresponding indirect effects that cannot be estimated in conventional analyses. Effects on the transition rates to first and second births (and other binary model variables) are estimated by probit regressions (*McCullagh/Nelder* 1989) with robust standard errors (Huber-White correction).

The operationalization of the various covariates will be explained below:

1. *Process time*: In the transition to first birth, the bell shape of the transition rate is modeled by using age as a linear and a logarithmic term. The age of the first child is used in the models for the second birth, along with a logarithmic term.
2. In order to identify *period effects*, the serial number of the panel wave is controlled for.
3. *Type of partnership* is captured via a categorical time-varying variable, with one of the following four values: marriage, unmarried couple (non-marital unions with a shared household), "living apart together" (unmarried, separate households) and single (i.e. no partner).
4. *Level of education* is operationalized as a time-varying covariate, according to the CASMIN classification which takes into consideration school, vocational and professional education and assumes an ascending order of

certificates and qualifications (*Brauns*/*Steinmann* 1999). The original ten categories were transformed into the years of schooling required to obtain the respective leaving qualifications in Germany (coding scheme: CASMIN 0=12 years; 1a=8; 1b=9; 1c=11; 2a=12; 2b=10; 2c_gen=13; 2c_voc=15; 3a=16; 3b=18).

5. *Educational status* is measured by a time-varying dummy variable, which is coded as "1" if the subject is currently enrolled in the educational system (secondary education or vocational training and tertiary education respectively, excluding further training). Educational status is introduced as a time-lagged variable in order to avoid biased effect estimators due to a reversal of the causal order.

6. Indicators of *occupation and family orientation* are based on the question of how important work, occupational achievements and family life, respectively, are for the respondents (four-point scale, 4 "very important", 3 "important", 2 "rather unimportant", 1 "very unimportant").[4] In the period under observation, these items were assessed in five waves (1992, 1994, 1998, 1999 and 2004). For the waves 1990 and 1991, the value from the 1992 wave was taken over; subsequently, values from the previous wave are taken until the corresponding characteristic is assessed again.

7. Additionally, net *weighted household income* is measured by a time-dependent, lagged variable. The weight is determined from the number of persons living in the household (according to the new OECD scale: principal earner = 1.0, other persons in the household over age 14 = 0.5, persons in the household under age 14 = 0.3; cf. *Geißler* 2006: 79). The resulting weighted income is logarithmized to compensate for the right-skewed distribution.

8. *Religiosity* (z score) is operationalized by the item "frequency of churchgoing and attendance at other religious events" and the question of how important religion is for the respondent (four-point scales). In the observational period, subjects were interviewed eleven times as regards the frequency of churchgoing (1990, 1992, each year in the period 1994-1999, then every second wave), with the response categories 1 "never", 2 "seldom", 3 "monthly", 4 "weekly". The question concerning the importance of religion (same response categories as in 6.) was assessed three times (1994, 1998, 1999). Between 1994 and 2000, religiosity is computed by averaging over both indicators; in all other waves, only the frequency of churchgoing is used.

9. Additionally, a set of dummy variables for *religious denomination* was used (four categories: no denomination, Catholic, Protestant, other denomination). The corresponding information was gathered in 1990 (waves G and Z respectively), 1997 (N) and 2003 (T).

10. *Life satisfaction* is measured on a scale from 1 to 10 (from 1 = highly dissatisfied to 10 = very satisfied). This item has been used in all SOEP waves (exception: 1991) and enters into the analysis as time-dependent and lagged (i.e. from t-1).

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4 As regards family orientation, respondents were asked in 1994, 1998 and 1999 how important family was for their satisfaction. In 1992 and 2004, respondents were asked how important their own children were for their satisfaction.

11. Availability of *informal childcare* is operationalized by a time-varying dummy variable, coded 1 if the respondent's mother or father lives either in the respondent's household or in the vicinity.
12. The dummy indicator for *East vs. West German* is based on the current place of residence. Residential mobility between the two parts of Germany is captured in that the variable is coded as time-varying.

3 Results

The empirical analyses follow a two-step procedure: In section 3.1, time trends in the fertility determinants mentioned over the period under observation (1990-2006) are analysed, focusing on differences between the East and West German sub-samples. The second step is to test whether the East and West German women under study differ in their transition rate to the first and second child, and whether any differential trends across time (i.e. harmonization or divergence) can be identified (Chapter 3.2). Additionally, each of the intervening mechanisms is tested on a multivariate basis through the computation of indirect effects.

3.1 Development of Fertility Determinants in East and West Germany over Time

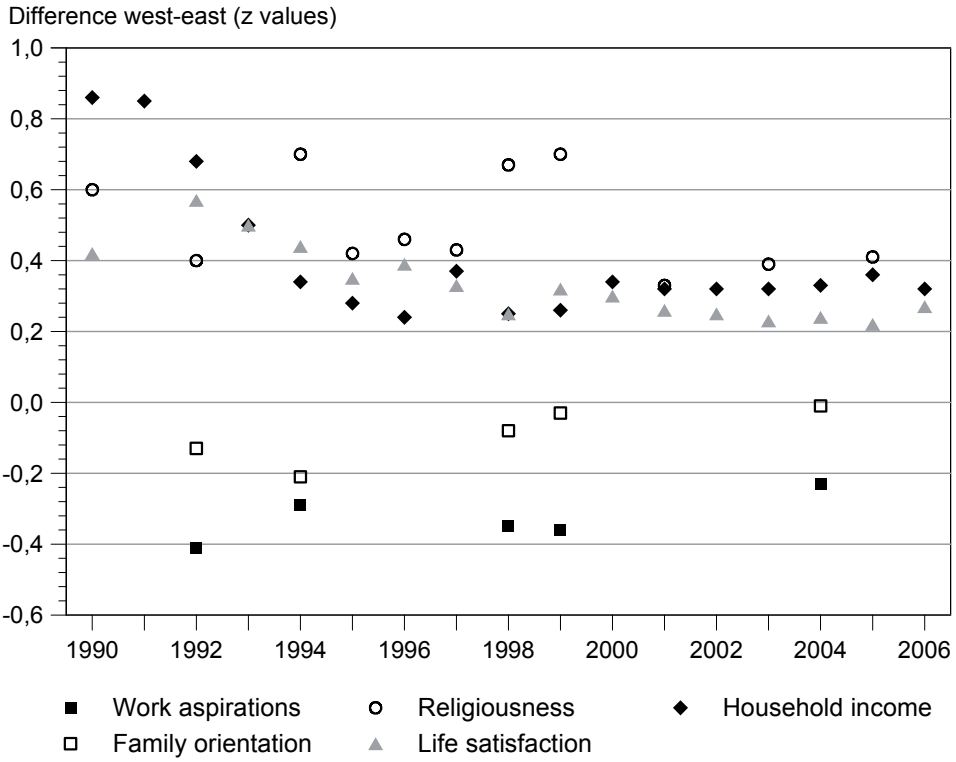
Figure 1 graphically displays the mean differences in potential fertility determinants among the interviewed East and West German women over time. The data points depicted were calculated by subtracting the East German from the West German means at each time of measurement. Accordingly, a positive value means that West German women score higher on average compared to East German women, whereas a negative difference score implies a relatively lower mean for West German women. The period under observation (i.e. 17 panel waves) is represented on the horizontal axis.[5] The analysis includes all women from birth cohorts 1970 and younger.

In general terms, the assumptions with regard to key differences between East and West German women are largely confirmed empirically: Whereas the East German women from our sample have a higher occupational and family orientation, they are less religious and less satisfied with their lives and possess fewer economic resources than the West German women.

In line with existing research (e.g. *Gerlach/Stephan* 2001; *Geißler* 2006), figure 1 shows a trend towards convergence of both life satisfaction and household incomes in East and West Germany. Additional analyses (not shown) indicate that

5 The analysis consists of panel and trend components. As to the panel part, our results indicate the degree to which individual subjects change, on average, across time. Concerning the trend component, some subjects enter the sample at a later stage (e.g. because of changes in the household composition or in the context of the 1998 supplement sample).

Fig. 1: Differences between East and West German women in potentially-relevant fertility determinants over time (birth cohorts beginning in 1970)



Note: In the waves for 1994, 1998 and 1999, religiosity is computed by averaging over frequency of churchgoing and subjective importance of religion; in all other waves only frequency of churchgoing is used.

Source: SOEP (Waves G-W, 1990-2006, own calculations)

the life satisfaction and household income of East German individuals, relative to West Germans, have risen over time. Moreover, the differences as regards family orientation, only observed for 1992 and 1994, have evened out. If we focus on childless couples, however East German women in fact turn out to be significantly more family oriented, even in 2004.[6]

In terms of all the other characteristics represented in the diagram, a considerable degree of continuity of the differences between East and West German women can

6 All differences between East and West Germany displayed in Figure 1 are statistically significant at least at the 5 percent level according to t tests. The only exceptions are the non-significant mean differences in family orientation in 1998, 1999, and 2004.

be observed over time. This also applies to occupational orientation and religiosity. Taken together, we conclude that the differences between East and West Germany as regards the fertility determinants analysed (stemming either from socialization or from the transformation process) have not ceased to exist. Bearing this in mind, there is little reason to expect social homogeneity or similar fertility patterns (see the following section) across both parts of Germany.

3.2 Period-Specific Differences in Fertility Patterns between East and West German Women

3.2.1 Descriptive findings

In order to describe the differences between East and West German women's likelihood of first and second births, we use nonparametric survivor functions (see Fig. 2). Regarding the transition to first-time parenthood, it can be ascertained that East German women tend to become parents sooner than West German women, although this difference is not particularly pronounced before age 25. This differential is reversed when it comes to second births: West Germans exhibit a clearly accelerated rate of second births once they have become first-time parents. Both results are well in line with findings from life course studies.

Beyond a mere description of fertility processes in East and West Germany, the primary focus of this study is on the explanation of the differing relative transition rates of East and West German women concerning first and second births. In the following sections, differentials between East and West German women are traced back to the various intervening variables outlined above.

3.2.2 Differentials in the Transition to Parenthood: An In-depth Explanation

The regression models shown in Table 2 serve to determine whether the differences depicted in the survivor functions are statistically significant. There is a significantly higher likelihood of first births among East German women overall in the period 1990 through 2006 (Tab. 2, model 1), supporting Hypothesis 1.[7]

The remaining models (2 through 5) in Table 2 serve to explain this initial difference. The first set of covariates is introduced in model 2. There are negative effects on the transition rate of educational status (*Blossfeld/Huinink* 1991) and work aspirations (*Barber* 2001). Although the effect of years of education tends to be negative, it remains insignificant until income and life satisfaction are controlled for (model 3). Availability of informal childcare exerts a positive effect on the transition to parenthood (*Hank et al.* 2004), whereas religiosity has no impact.

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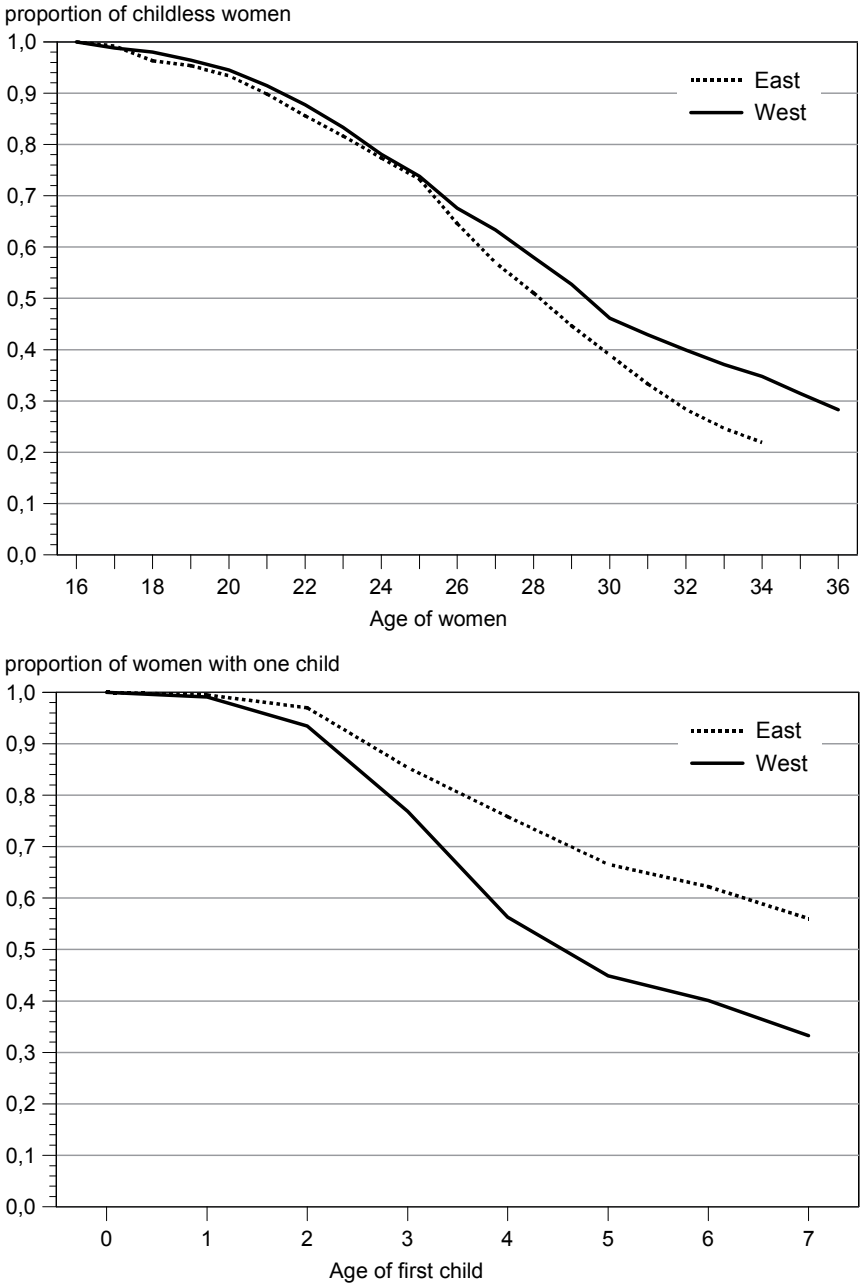
7 Additional analyses showed that the difference remained invariant across time, indicated by insignificant interaction effects between the dummy "West German" and the period indicators.

Fig. 2: Transition to first and second births in East and West Germany (nonparametric survival functions)



Note: 17- to 36-year-old women of birth cohorts beginning in 1970

Source: SOEP (Waves G-W, 1990-2006, own calculations)

Tab. 2: Predictors of transition to first birth (discrete-time survival analysis, b coefficients with z values in parentheses)

	Model				
	1	2	3	4	5
West Germany	-.10*	-.15**	-.20**	-.08	-.02
	(-2.19)	(-3.19)	(-4.06)	(-1.43)	(-0.33)
Years of education	-	-.01	-.02*	-.02*	-.01
		(-1.51)	(-2.08)	(-2.31)	(-1.31)
In education	-	-.50**	-.49**	-.47**	-.33**
		(-9.63)	(-9.33)	(-8.87)	(-5.57)
Work aspirations	-	-.14**	-.14**	-.18**	-.13**
		(-4.06)	(-3.98)	(-4.97)	(-3.48)
Religiousness (z score)	-	.02	.02	.03	.01
		(0.82)	(0.77)	(1.01)	(0.17)
Informal childcare available	-	.25**	.26**	.28**	.60**
		(5.03)	(5.19)	(5.44)	(10.03)
Household income (ln)	-	-	.19**	.13**	.03
			(4.22)	(2.68)	(0.68)
General life satisfaction	-	-	.01	.01	-.01
			(0.98)	(0.76)	(-0.85)
Family orientation	-	-	-	.33**	.24**
				(8.89)	(6.06)
No religious denomination	-	-	-	.18**	.11
				(2.66)	(1.61)
Protestant	-	-	-	.04	-.01
				(0.70)	(-0.10)
Other denomination	-	-	-	.08	-.08
				(0.92)	(-0.80)
Type of union: Marriage	-	-	-	-	1.66**
					(18.89)
Type of union: Cohabitation	-	-	-	-	1.23**
					(11.15)
Type of union: LAT	-	-	-	-	.43**
					(4.89)
West Germany × cohabitation	-	-	-	-	-.36**
					(-3.29)
Age of woman (-14)	-.07**	-.04^{+}	-.04^{+}	-.01	.02
	(-2.86)	(-1.75)	(-1.70)	(-0.28)	(0.79)
Age of woman (-14) (ln)	2.36**	1.06**	.98**	.64*	.05
	(5.94)	(4.05)	(3.72)	(2.42)	(0.16)
Panel wave	-.02**	-.01	.00	.01	.03**
	(-3.75)	(-1.19)	(0.00)	(1.38)	(3.51)
Reduction of Log Likelihood	201.1**	351.4**	371.8**	474.0**	1062.4**

Note: $^{+}$ p= .10; * p= .05; ** p= .01; Link function: Probit; women aged 17 to 36, from birth cohorts beginning in 1970; n = 522 birth events, n = 10,389 person years; reference for religious denomination: catholic; reference for type of union: women without partner; flag variables for missing type of union and missing religious denomination have been added to models 4 & 5.

Source: SOEP (Waves G-W, 1990-2006, own calculations)

Beyond these direct effects, it becomes obvious in model 2 that the differential between East and West German women grows even stronger (from b=-.10 to b=-.15) after controlling for the aforementioned factors. A glance at the corresponding indirect effects in Table 3 further qualifies these results. The positive sign of the indirect effects which differs from the negative sign of the dummy for "West German" suggests that East German women exhibit a slightly higher likelihood of first births, *despite* being more highly educated (supporting Hypothesis 4) and more work-oriented (see Hypothesis 3). Hence, statistically controlling for the latter variables actually increases the existing differential.[8] In contrast, educational status and religiosity do not generate any change in the East-West differential (insignificant indirect effects).

Model 3 reveals that, whereas net household income has a positive impact on the likelihood of a first birth (*Schoen et al*. 1999), there is no effect of general life satisfaction. More importantly, these two factors do not seem to explain the differential between East and West Germany, but in fact they increase it further. The positive indirect effect of household income indicates that the relative gap in first births in West Germany would tend to be even wider if East German households had economic resources similar to West German couples. This finding partly corroborates Hypothesis 2.

The most striking results are shown in model 4. The direct effects depicted suggest that family orientation generally increases the propensity to start a family. A surprising result concerns religious denomination: Respondents who are non-denominational exhibit a *higher* likelihood of first births than those who belong to a denomination. Although this finding may seem counterintuitive at a first glance, a closer inspection reveals that it is corroborated by existing research. For example, *Techman* and *Schollaert* (1991) report that, whereas religion increases the rate at which *married* couples start a family, it also greatly delays the time before marriage. Hence, religious people seem to devote more time to the search for a partner, but once they have committed themselves to their partners (e.g. by marrying), they readily become parents. In empirical terms, the delaying effect of religion on marriage seems to outweigh its accelerating effect on fertility after marriage. T*hornton et al*. (1992) report similar findings. We are able to replicate these results: In model 5, the positive effect of "no denomination" becomes insignificant once the type of relationship is controlled for.

The central result from model 4 concerns the insignificant effect of West vs. East German. Turning to the strong negative indirect effects in Table 3, it becomes evident that the lower rate of first births among West German women can be entirely explained by their lower family orientation (see Hypothesis 5), and by their stronger denominational commitment (Research question); whereas 84.9 % of the childless in the West German sub-sample have a religious denomination, the proportion is

8 As a non-technical interpretation of this result, one could think about the following hypothetical case: If East and West German women were similar in their work aspirations and in their educational level, the relative deficit of first births of West (as compared to East) German women would be even more pronounced than it already is.

Tab. 3: Specific indirect effects of residence in West Germany on the transition to first birth

Indirect effect	Beta	t
West German → in education → hazard rate	.010	1.43
West German → years of education → hazard rate	.015*	2.25
West German → work aspirations → hazard rate	.025**	3.80
West German → religiousness → hazard rate	.008	0.95
West German → life satisfaction → hazard rate	.007	0.78
West German → household income → hazard rate	.019*	2.03
West German → informal childcare available → hazard rate	-.008	-1.53
West German → family orientation → hazard rate	-.032**	-3.41
West German → no denomination → hazard rate	-.094*	-2.48
West German → protestant → hazard rate	.005	0.61
West German → other denomination → hazard rate	.005	0.74

Note: + p= .10; * p= .05; ** p= .01; Link function: Probit; women aged 17 to 36, from birth cohorts beginning in 1970; n = 522 birth events, n = 10,389 person years; model specification derived from model 4 in table 2; reference for religious denomination: Catholic

Source: SOEP (Waves G-W, 1990-2006, own calculations)

as low as 25.6 % among East German women. In sum, the higher rate of first births among East German women as compared to West Germans after unification can be explained by differing long-lasting cultural differences between these two subpopulations, namely the differing role of religion and attitudinal discrepancies with regard to family orientation.

The last model 5 controls for the type of relationship, along with an interaction effect between type of relationship and the dummy variable "West German".[9] Three important insights result from this model. First, the more committed the type of partnership, the higher the likelihood of first births (cf. *Heaton et al.* 1999), although the corresponding effects now refer to East Germany (cf. *Frazier et al.* 2004). Second, the positive impact of non-marital cohabitation (compared to being single) is significantly more pronounced among East German women, a finding that is in line with existing research (see *Konietzka/Kreyenfeld* 2005). Third, the effects of education and household income are not causal; rather, they are fully explained by the type of relationship.

9 Note that in this model, the main effect of West German becomes conditional in that it refers to respondents without a partner (cf. *Frazier et al.* 2004). Hence, this effect is not interpreted further.

3.2.3 Differentials in the Likelihood of Second Birth: An In-depth Explanation

In line with previous studies (*Dornseiff/Sackmann* 2003), West German women exhibit a considerably higher likelihood of transition to a second birth (see Fig. 2, lower panel). This effect is statistically significant (see Tab. 4, model 1) and even stronger than the differential concerning the transition to parenthood. Additional interaction effects with the panel wave were calculated. Similar to the results for the first child, no shift over time in the difference between East and West German women can be observed.

Characteristics of East German women that should promote fertility are introduced in model 2. Family orientation has a clearly positive direct impact on the transition rate (*Schoen et al*. 1999). In contrast to its negative effect on first births, neither level of education nor enrolment in the educational system exhibit any effect on the likelihood of second births. As indicated by the insignificant indirect effects (see Tab. 5), none of the three variables account for the East-West differential.

In model 3, we control for variables that should decrease the relative transition rate of East German women to their second child, thus serving as potential explanatory factors for the East-West differential. Similar to first births, the availability of informal childcare has an effect (albeit a small one) on the rate of transition to second births. We find positive effects of religiosity (*Brose* 2006) and life satisfaction and a negative impact of work aspirations (*Budig* 2003). Religious denominations do not exert any effect beyond religiosity, though. The positive indirect effects of these three variables (see Tab. 5) indicate that they provide a partial explanation of the differential concerning second births between East and West German women. West German women are thus more likely to have a second birth partly *because* they are less work-oriented, more religious and more satisfied with their lives, in line with Hypotheses 2 and 3.[10] However, the difference is not fully explained because the coefficient for West Germany remains significant in model 3 (see Tab. 4).

Moreover, model 4 indicates that both cohabiting and being married to the partner significantly increase the likelihood of second births (as compared to not having a partner). Additionally, it can be seen in model 4 that the effects of work aspirations, family orientation and life satisfaction are confounded with type of relationship.

[10] Because there is neither a linear nor a quadratic effect of household income on the likelihood of second births, this variable is not included in the analyses.

Tab. 4: Predictors of transition to second birth (discrete time survival analysis, b coefficients with z values in parentheses)

	Model			
	1	2	3	4
West Germany	.31**	.33**	.23*	.23*
	(4.74)	(4.69)	(2.45)	(2.33)
Years of education	-	.01	.01	.00
		(0.44)	(0.66)	(0.06)
In education	-	-.02	.01	.16
		(-0.22)	(0.06)	(1.35)
Family orientation	-	.23**	.20**	.09
		(2.85)	(2.83)	(0.97)
Religiousness (z score)	-	-	.08*	.08*
			(2.32)	(2.12)
No denomination	-	-	.01	.06
			(0.11)	(0.59)
Protestant	-	-	.11	.17^{+}
			(1.06)	(1.92)
Other denomination	-	-	.18	.12
			(1.43)	(1.08)
Work aspirations	-	-	-.08*	-.06
			(-1.96)	(-1.29)
General life satisfaction	-	-	.04*	.01
			(2.00)	(0.52)
Informal child care available	-	-	.18^{+}	.19^{+}
			(1.82)	(1.69)
Type of union: Marriage	-	-	-	.94**
				(5.32)
Type of union: Cohabitation	-	-	-	.89**
				(4.66)
Type of union: LAT	-	-	-	.26
				(1.04)
Age of first child (+1)	-.46**	-.45**	-.45**	-.47**
	(-10.48)	(-10.30)	(-9.91)	(-8.82)
Age of first child (+1) (ln)	2.19**	2.15**	2.11**	2.21**
	(11.62)	(11.37)	(10.70)	(9.68)
Panel wave	-.02*	-.01^{+}	-.01	-.01
	(-2.19)	(-1.72)	(-1.02)	(-0.85)
Reduction of Log Likelihood	257.5**	266.8**	290.0**	338.1**

Note: $^{+}$ p= .10; * p= .05; ** p= .01; Link function: Probit; women aged 18 to 36, from birth cohorts beginning in 1970; n = 338 birth events, n = 3,387 person years; reference for religious denomination: Catholic; reference for type of union: women without partner; flag variables for missing type of union and missing religious denomination have been added to models 3 & 4.

Source: SOEP (Waves G-W, 1990-2006, own calculations)

Tab. 5: Specific indirect effects of residence in West Germany on the transition to second birth

Indirect effect	b	t
West German → in education → hazard rate	.001	0.06
West German → years of education → hazard rate	-.011	-0.66
West German → work aspirations → hazard rate	.021^{+}	1.83
West German → religiousness → hazard rate	.036*	2.19
West German → life satisfaction → hazard rate	.018^{+}	1.85
West German → family orientation → hazard rate	-.011	-1.56
West German → no religious denomination → hazard rate	.009	0.12
West German → protestant → hazard rate	.027	0.77
West German → other religious denomination → hazard rate	.014	0.54
West German → informal childcare available → hazard rate	.002	0.40

Note: $^{+}$ p= .10; * p= .05; Link function: Probit; women aged 18 to 36, from birth cohorts beginning in 1970; n = 338 birth events, n = 3,387 person years; model specification derived from model 3 in table 4; reference for religious denomination: Catholic.

Source: SOEP (Waves G-W, 1990-2006, own calculations)

4 Summary and Discussion

The present study compared the value of two approaches to explaining the fertility differential between East and West Germany. The first highlights the role of discrepancies in attitudes and values, stemming from both long-standing sociocultural differences and from experiences in two opposite political systems. The second approach stresses the role of temporary strains (e.g. economic and biographical insecurities) in the aftermath of the system change that has taken place.

With regard to the first approach, we find that even more than one decade after unification there is still evidence of sustained socio-cultural differences that reduce the relative transition rate to first and second births among East German as compared to West German women). First, the lack of denominational affiliation and religiosity among East German women has to be mentioned. The historical roots of these characteristics lie in a long-standing secular tradition which was reinforced by the antireligious doctrine of the socialist regime (*Pollack* 1998). The implications of this peripheral role of religion in East Germany are, however, rather complex. Whereas it leads to an acceleration of first births (fuelled by a stronger tendency to commit oneself to a partner), it seems to reduce the propensity towards second births. Secondly, according to the literature (*Adler* 2004), East German women continue to exhibit particularly pronounced occupational aspirations. This feature still has an independent negative effect on the rate of transition to first and second births. Remarkably, however, East German women are characterized not only by a higher occupational orientation. At the same time, these women (at least those who remain

childless) also exhibit a significantly higher family orientation. This, in turn, has a positive effect on fertility.

The second approach argues that negative consequences of the political transformation have temporarily restricted fertility processes in East Germany. We find little evidence that the fertility differential between East and West Germany is a result of socio-economic consequences of the transformation process. Although the East German women's lower household incomes tend to operate as a suppressor variable for their elevated risk of first births, its effect becomes insignificant once relationship type is controlled for. Moreover, their lower life satisfaction only marginally contributes to explaining their lower risk of second births. However, it should be noted that the sample included only the birth cohorts starting from 1970. Those women who were relatively young (20 and younger) at the time of reunification had a number of years in front of them before the fertility processes studied in the present article typically become prevalent. Hence, it is not very surprising that the fertility behaviour of these women was not seriously affected by the societal transformation process because they had plenty of time to recover from the first "shock". Further research is required to compare these younger cohorts to older women from a genuine period-specific perspective, something beyond the scope of the present article.

Nonetheless, we are able to fully explain the differential in first births between East and West Germany in the selected "post-unification" cohorts by means of the modeled intervening variables; to our knowledge, this has not been done in previous studies. Although the differing transition rates to the second child could also be partially explained, a residual difference however remains unaccounted for by the available explanatory factors.

In general terms, the present study substantially extends previous research by using a panel approach instead of conventional event history analyses or trend descriptions based on register data. We thereby managed to disentangle different types of factors underlying the persistent fertility differential between East and West Germany: short-term period effects of the German reunification, long-term cultural differences between the East and West German subpopulations and structural differences in educational and labour market opportunities. Computing indirect effects within a path model framework made it possible to assess the direction and relative strength of the various intervening mechanisms. Whereas the findings of most existing studies relate to the immediate effects of the societal transformation of East Germany (*Kreyenfeld/Konietzka* 2004), or integrate them into the general framework of "catch up modernization" (*Schneider et al.* 1995) and of demographic transition models, this panel study also accounts for persisting regional cultural differences within Germany, as indicated by religious affiliation, family orientation and work aspirations. It is not necessarily the existence, but rather the persistence of sociocultural differences between East and West Germany, that is surprising. Although coarse, cross-sectional measures such as the TFR might suggest a picture of convergence or adaptation, we feel that characterizing the corresponding fertility trends with these terms does not adequately reflect the complex puzzle underlying

the differing, parity-specific fertility patterns in the Eastern and Western parts of Germany.

Moreover, the study challenges the prevalent view of the political unification of Germany as being a kind of "natural experiment". In fact, this view presupposes a homogeneous population, within which one group experiences a defined "treatment". Empirical evidence shows that regional cultural differences already existed prior to the existence of the GDR, and it is unclear whether the FRG represents a valid control group. Accordingly, the homogeneity criterion is massively violated. Consequently, this study follows a theoretical framework within which fertility transitions are conceptualized in a combined context and life-course approach (*Nauck* 1995: 46ff, 2000; *Hank* 2002, 2003): Social contexts provide not only *opportunity structures* for the realization of individual action preferences and serve as *targets of selective migration*, but are also places of *social control,* of *transmission of cultural patterns* and ways of life, as well as *objects of identification*. As far as the dataset that was used allows for the inspection of the latter mechanisms, this study is the first to account for such long-lasting socio-cultural differences between East German and West German women.

Finally, some limitations of the present study should be mentioned. One caveat is that we cannot apply a dyadic design to the analyses because the sample is restricted to women. Unfortunately, there are no data available in the SOEP for male partners not living in the respondent's household. However, the high unemployment rate of male partners in the new federal states might be relevant with regard to the fertility patterns examined. Moreover, the data available do not enable us to completely explain all parity-specific differences in fertility patterns between East and West Germany. Some unobserved heterogeneity remains for the transition to second births; further research is required here. Lastly, it should be taken into consideration that, in some cases, it was only possible to measure the relevant attitudes with single-item indicators. This may have had a negative influence on the reliability of the instruments and, consequently, might have reduced the explanatory power of the models. Future studies should place greater emphasis on the less frequently considered explanatory factors based on panel data, such as family-related perceptions, as well as the subjective compatibility of family and career.

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