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Socioeconomic differences in the unemployment and fertility nexus: Evidence from Denmark and Germany☆

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ABSTRACT

Studies that have investigated the role of unemployment in childbearing decisions have often shown no or only barely significant results. We argue that many of these "non-findings" may be attributed to a neglect of group-specific differences in behavior. In this study, we examine how the association of unemployment and fertility varies by socio-demographic subgroups using data from the German Socio-Economic Panel (GSOEP) and from Danish population registers. We find that male unemployment is related to a postponement of first and second childbearing in both countries. The role of female unemployment is less clear at these two parities. Both male and female unemployment is positively correlated with third birth risks. More importantly, our results show that there are strong educational gradients in the unemployment and fertility nexus, and that the relationship between unemployment and fertility varies by socioeconomic group. Fertility tends to be lower during periods of unemployment among highly educated women and men, but not among their less educated counterparts.

1. Introduction

There is a large body of research on the economic determinants of childbearing behavior. Much of the empirical literature has assumed that economic hardship and labor market uncertainties will cause people to postpone or revise their fertility plans (Adserà, 2004; Bernardi, Klärner, & von der Lippe, 2007; Gutiérrez-Domènech, 2008; Hofmann & Hohmeyer, 2012; Kreyenfeld, Andersson, & Pailhé, 2012; Matysiak & Vignoli, 2013; Mills & Blossfeld, 2003; Neels, 2010; Pailhé & Solaz, 2012; Perelli-Harris, 2006; Sobotka, Skirbekk, & Philipov, 2011). However, empirical evidence on the unemployment and fertility nexus has remained inconclusive. Many studies have only produced weak and insignificant results (e.g., Özcan, Mayer, & Luedicke, 2010), and others have even reported positive relationships between unemployment and subsequent fertility (e.g., Schmitt, 2012a, 2012b). There may be several reasons for the weak and often insignificant findings of prior research. One important reason may be that unemployment has a different meaning and significance depending on the life-course stage and socio-economic position a person holds. Much prior research could not account for these aspects, as it often relied on small samples that made it difficult to study fine-tuned group-specific differences in behavior. Our study aims at addressing this issue by drawing on large scale data from Denmark and Germany. Using event history modeling, we examine how the unemployment and fertility nexus varies by birth order, age, education and welfare state context. We have chosen to focus on Denmark and Germany, two countries that represent very contrasting welfare regimes in Europe. While Germany is widely seen as a prototypical example of a country with a conservative male breadwinner family model, Denmark is prominent

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among the countries with a tradition of advocating better "work-family balance" and supporting dual earner family arrangements. Data for our study come from the German Socio-Economic Panel (GSOEP) and from Danish population registers. These data cover the demographic and labor market biographies of both men and women in the two countries. In particular, the Danish population registers provide us with a dataset large enough to allow us to examine with a high degree of accuracy the behavior of relatively small population sub-groups.

We anchor our investigation in life-course research that is concerned with the inter-linkage of different life domains and acknowledges the role of welfare state and labor market contexts for structuring individual life courses (Mayer, 2009). This approach is markedly different from economic studies on the same topic, which often conceptualize fertility as a single outcome variable (see e.g., Del Bono, Weber, & Winter-Ebmer, 2012), and thus do not comprehend fertility choices as a succession of transitions in the life course. The remainder of our article is organized as follows. The next section (Section 2) provides an overview of previous micro-level studies that address the unemployment and fertility nexus. Section 3 provides the theoretical framework. We elaborate on why we expect to find fertility differences by age, education and welfare state context. This is followed by a 'data section' (Section 4) that includes a brief summary of the overall fertility trends in the two comparison countries and a description of the micro-level data. Section 5 includes the empirical investigations based on event history analyses of first, second, and third birth risks in Denmark and Germany. All of the analyses are conducted for men and women separately. The final section concludes with a brief discussion.

2. Previous research

In recent decades, many European countries have witnessed sharp increases in the ages at which people start having children. Some countries, such as France and the Nordic countries, have retained relatively high period and cohort fertility levels. In other countries, fertility rates have declined and the share of childless have increased over the cohorts. Scholars have argued about how to interpret these developments (Billari & Kohler, 2004; Caldwell & Schindlmayr, 2003; Lesthaeghe, 2010). However, at least since the latest economic crisis swept through Europe, a view has emerged that youth unemployment and labor market uncertainties are important factors in understanding why people postpone fertility and family formation in contemporary societies (Goldstein, Kreyenfeld, Jasilioniene, & Örsal, 2013; Sobotka et al., 2011).

However, the micro-level data on the associations between individual-level labor market uncertainties and childbearing do not provide clear-cut evidence on these matters. For example, using register data for Norway, Kravdal (2002) examined the role of individual and aggregate unemployment for parity-specific childbearing progressions. While he found some negative effects of aggregate unemployment on fertility, he concluded that the role of individual-level unemployment in fertility behavior is "negligible." A recent study that drew upon data from the European Community Household Panel also provided mixed results (Schmitt, 2012a). According to this study, male unemployment tends to reduce first birth rates, but the magnitude of this effect differs substantially between countries. For example, the negative effect of men's unemployment on first birth rates was found to be modest in the UK and Germany but large in France. While a study by Pailhé and Solaz (2012) confirmed that male unemployment delays first childbearing in France, their findings suggested that the strength of the effect is much weaker than was reported in the study by Schmitt (2012a). The results on female unemployment have been even more heterogeneous. In this respect, we note that many studies did not distinguish unemployment from non-employment, but merely contrasted women who were employed and those who did not participate in the labor market, regardless of whether they were unemployed or not working for other reasons (Matysiak & Vignoli, 2008, 2013). In general, the studies that distinguished female unemployment from other types of inactivity found that female unemployment is unrelated or even positively related to first-birth transitions in countries across Europe (Andersson, 2000; Gerster & Lappegård, 2010; Kravdal, 2002; Kreyenfeld, 2010; Lundström & Andersson, 2012; Özcan et al., 2010; Pailhé & Solaz, 2012; Schmitt, 2012a, 2012b). Some of the differences in patterns may be attributable to differences in national welfare state arrangements and labor market structures, as researchers found that female non- or unemployment stimulates first birth progressions mainly in traditional male breadwinner countries (Kreyenfeld et al., 2012; Schmitt, 2012a).

While the observed patterns for first births may well be linked to differences in the labor markets and social policies of countries, the findings for higher order births have tended to appear even more inconclusive. In particular, research on the role of individual unemployment in third birth fertility has produced patterns that seem to defy any "welfare state logic." Kravdal (2002) has, for example, shown that fathers' unemployment is positively associated with transitions to third or fourth births in Norway. Andersson and Scott (2007) report similar findings for unemployed fathers' third birth fertility in Sweden. Gerster and Lappegård (2010) found elevated third birth rates for unemployed women in Norway, and similar results have been reported for Sweden as well (Andersson, 2000). These findings are quite remarkable considering that having a third child results in an extended family size that goes beyond the standard two-child norm of most European societies. Apparently, individual unemployment, male or female, is not a detrimental factor in the decision to have an above-average family size.

There may be several reasons for the lack of a strong and uni-directional relationship between individual unemployment and fertility. First, we could posit that economic factors are generally unimportant for understanding fertility variations, and that ideational and other factors explain the larger picture (e.g., Lesthaeghe, 2010). Secondly, we could argue that individual unemployment is not necessarily a good indicator of economic uncertainty

and adverse economic conditions. It may not be the current lack of employment which causes people to revise their fertility plans, but rather uncertainties about the future employment prospect, which may be only loosely related to the current employment status. Thirdly, it could be asserted that unemployment is a poor indicator of economic uncertainty, because people do not experience unemployment at random. A large body of labor market literature has shown that men and women who are unemployed are a select group of people who also differs in many other dimensions from the employed population. Accounting for the selectivity of the unemployed population or trying to find evidence of exogenous "unemployment shocks" (Del Bono et al., 2012) would be one way to detect truly causal impacts of unemployment on fertility choices. A fourth reason why we did not find evidence of strong relationships between unemployment and fertility may be that previous research has neglected crucial aspects of fertility choices as being embedded in larger life course dynamics. Whether unemployment makes people revise or postpone their fertility plans must depend on the social context and the individual life course prospects that are available to an individual in that specific context. This provides the motivation for us to study differences in relationships by women and men's age group, birth order, socio-economic status, and country of residence.

Others have also studied the interaction of socio-economic status and unemployment in childbearing behavior, albeit for first births only. Pailhé and Solaz (2012) found no interaction effects of education and unemployment for first birth rates of women in France. For men, they showed that lowly educated men who were unemployed tended to postpone becoming a father. Schmitt (2012a) studied the behavior in Germany, France and the UK and found interaction effects for women but not for men. Özcan et al. (2010) investigated differences in first birth risks by duration of unemployment, education and region in Germany. They provided mixed and partially counterintuitive results, such as elevated first birth risks for highly educated East German women with long unemployment durations.

Unfortunately, none of the abovementioned studies are very explicit about the number of exposures and events that entered their interaction models. However, it is obvious, that some of the results were driven by the reports of only a few respondents. For example, the study by Özcan et al. (2010) is based on a sample that only produced 142 first birth events for women in East Germany. Considering that unemployment is a rare event, any interaction of educational level and duration of unemployment must lead to extremely sparse matrices. In the paper by Schmitt (2012b), 479 first birth events were reported for West German women. Given that only about five percent of the exposure time was related to unemployment, we estimate that the number of first births in unemployment was no higher than 30 events. For the interaction models, these cases must be broken down further by level of education and duration of unemployment. Only the study by Pailhé and Solaz (2012) was based on a more substantive sample with about 3200 first birth events for women and 2400 events for men. In their case, the possible drawback was that their study was not based on prospective survey data, but rather on a retrospective survey which relied on the recollection of employment histories which spanned a period of up to 30 years before interview time.

We do not want to discredit these prior investigations but just highlight that several of the interactions they present stand on rather thin empirical ground. In our study, we will rely on Danish register data, which will allow us to provide much more firm empirical evidence of group-specific differences in childbearing behavior. As we will demonstrate, our German survey data will also allow us to conduct a few group-specific analyses for first order births, but not as fine-tuned as the interactions we can produce with the Danish data.

3. Theoretical considerations and hypotheses

3.1. Life-course differences in the unemployment and fertility nexus

Life course theory focuses on the embeddedness of human action in context and time (Elder, 1994; Mayer, 2009). Its main motive is to understand the timing and temporal ordering of events and how they are situated in the broader life courses of individuals. For fertility research this brings a focus on the timing of first parenthood and the spacing of subsequent births in the life courses of women and men.

Most life course literature presumes that uncertainties in the early stages of adult life are most detrimental for fertility decisions (Mills & Blossfeld, 2003). Youth unemployment causes feelings of uncertainty and desperation among young people who fail to gain a foothold on the labor market. At younger ages, people also have greater leeway to postpone various life plans, such as those related to family formation and childbearing. This is more difficult at later ages when, particularly for women, the biological limits of fertility are approaching. This presumption fits recent macro level studies which show no large impacts of aggregate unemployment on first birth rates of women at the higher reproductive ages, but significant effects of unemployment on first birth rates at the younger ages (Goldstein et al., 2013). *Against this background, one would expect that the impact of individual unemployment on the propensity to become a parent is particularly negative at younger reproductive ages.*

For second and third births, it is not only age, but also the duration since previous birth which is the chief 'clock' that governs fertility choices. Parents in most societies have their second children at rather regular intervals of about 2–4 years after a first birth. A rather close spacing of childbirths is often desired because parents seek to provide their first born child a playmate, and because they seek to minimize child-related career interruptions (Ní Bhrolcháin, 1986). In our case, the question is whether the experience of unemployment disrupts a fertility career by producing unusually large birth intervals and whether people give up plans to have a large family altogether in response to unemployment. *Because having a secure economic situation is assumed to be a prerequisite for having*

a larger family, our hypothesis is that we will find that unemployment lowers birth risks of higher orders.

3.2. Socio-economic differences in the unemployment and fertility nexus

Life-course theory furthermore suggests that individuals are constrained in their choices by the path dependencies of their biographical history (Diewald & Mayer, 2009, p. 7; Elder, 1998, p. 2). Past life course decisions structure the life course and predetermine future life course options. On the one hand, past decisions may lock people into certain tracks from which they are unable to break loose. On the other hand, past decisions reduce biographical uncertainties by limiting the universe of possible life course options to a feasible set of opportunities. This argument has become prominent to explain the sometimes high fertility of low educated young women. In their well-cited study on the "value of children and marriage", Friedman, Hechter, and Kanazawa (1994) argued that less educated and disadvantaged young women only appear to have children in inadequate economic situations. Subject to bleak employment prospects, these women perceive motherhood as a means to structure their otherwise uncertain life course. Motherhood is regarded as an escape route out of a biographical gridlock. These women have few biographical alternatives in other domains of the life course, and motherhood provides them with a predictable and fulfilling role.

Friedman et al. (1994) mainly used this conceptual framework to explain teenage fertility, welfare motherhood, and the high rates of out-of-wedlock childbearing among African-Americans in the U.S. However, the general thrust of the argument may well be generalized to other societies and contexts. Women who do not see much chances to "succeed in the mainstream economy" (McDonald, 2000, p. 10) may view motherhood as a means to structure an uncertain life courses. From this it follows, that unemployment may have a different meaning depending on the career stage and labor market options that are presented to a person. In general, unemployment is a much more common experience for low educated women and men than for highly educated people. For the low educated unemployment spells are often longer than for others. As such, women might differ in the way that they perceive unemployment as a suitable situation for having children. *Highly educated women who aspire to an employment career will likely delay parenthood when being unemployed, while less educated women may find the situation of being unemployed less incompatible with having children.*

This effect should be stronger for women than for men, as men rarely have the option to embrace fatherhood as a life course alternative to successful employment. Men are often regarded as breadwinners and have few alternatives than to succeed in the labor market. From this follows that own unemployment generally lowers men's propensity to become a father and have further children. However, the significance of unemployment may still differ for lowly and highly educated men. As indicated above, the experience of unemployment varies by level of education. For lowly educated men, unemployment is a recurrent event in the life course. Conversely, highly educated men must regard unemployment as an unusual phase in their life course. Given the relatively superior labor market options available to them, unemployment must be perceived a particularly unsuitable situation for having children. *From this, it follows that also for men we should find educational differences in the unemployment and fertility nexus.*

3.3. Social context and fertility choices

A crucial theme of life course research is the pervasive role of the *institutional and social conditions* in structuring life course decisions. These decisions are not made in limbo, but in a given historical and social context (Huinink & Feldhaus, 2009; Kohli, 2007; Mayer, 2005; Mayer & Schoepflin, 1989). In our study, we examine the childbearing behavior of women and men in the two welfare regimes of Denmark and Germany. The purpose is to determine whether socio-economic and other differences in the unemployment and fertility nexus are robust across these two European societal contexts.

Denmark and Germany represent two contrasting welfare state regimes. Germany is an archetypical conservative welfare regime. For decades, the traditional male breadwinner family model has been fostered by the German tax and transfer system, and employment rates among German women have been low. While the labor market participation of mothers has increased recently, most women with children are still working just part-time or on a marginal basis. The full-time employment rates of mothers have remained at surprisingly low levels for decades (Konietzka & Kreyenfeld, 2010). However, in recent years the German government has enacted radical reforms which call into question the categorization of Germany as a purely conservative welfare regime. The parental leave benefit reform in 2007, which was modeled on the Swedish system, has clearly put German family policy on a new trajectory (Fleckenstein, 2011; Henninger, Wimbauer, & Dombrowski, 2008). The very different situations in the eastern and western regions of the country are also important to take into account when looking at Germany. While family structures and employment patterns have remained rather conservative in the West, the behavior and attitudes of East German women and men are very different. Despite the fact that the risk of unemployment has been and continues to be an issue for East German women (see Fig. 1), their labor market attachment remained high after German reunification. Compared to West German women, they are more likely to seek employment; and, if employed, they are significantly more likely to be working full-time. The traditional non-working housewife is still a rarity in this part of the country.

Denmark is an example of a universalistic welfare state which, along with the other Nordic countries, radically reformed its family policies in the 1970s by expanding public day care and introducing individual taxation of spouses and parents. Some recent policy reforms, such as the elimination in 2002 of the paternity quota in the parental leave system, seem to contradict the principle of a

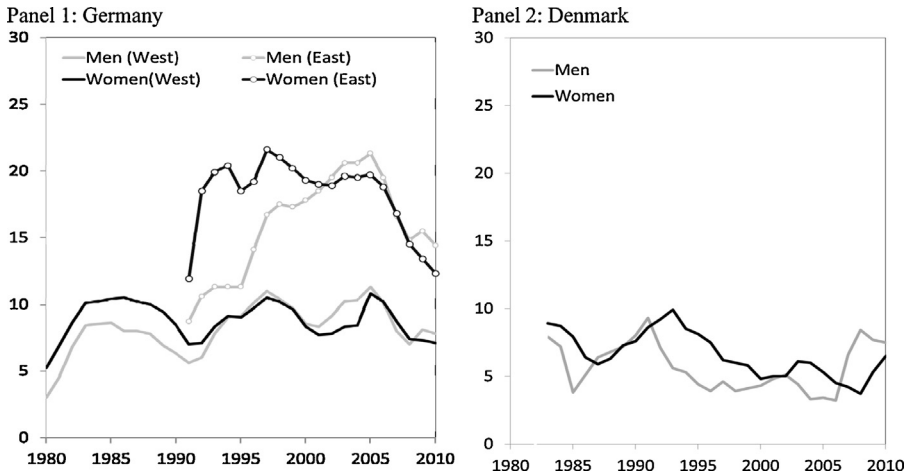

Fig. 1. Unemployment rates in Germany and Denmark, 1980–2010. *Note*: For Germany, the unemployment rates are based on registered unemployment in relation to the dependent civilian workforce. For Denmark, the ILO unemployment rates provided by Eurostat have been used.
Source: Denmark: Eurostat (2013); Germany: Bundesagentur für Arbeit (2013).

gender-equal dual earner society (Bruning & Plantenga, 1999; Ellingsæter & Leira, 2006). Nevertheless, Denmark still has one of the highest maternal full-time employment rates in Europe. Moreover, with respect to other gender equality indicators, Denmark is usually characterized as a gender-equal society that promotes maternal employment (Gash, 2009). In addition to supporting various family and social policies, the Danish labor market, with its large public sector and its renowned system of "flexicurity" in employment, provides more advantageous conditions for reconciling parenthood and work. These features were particularly important during periods of high unemployment in Denmark during the 1990s (see Fig. 1).

Against this contrasting background, one would assume that the gendered unemployment and fertility nexus varies by welfare state context. Since Germany is a prototype of a male breadwinner regime, men's individual unemployment should have a more strongly negative effect on childbearing behavior in Germany than in Denmark. A further argument that speaks for this hypothesis is that the flexible organization of the Danish labor market and the universally generous benefits in times of unemployment reduces the uncertainties connected to unemployment in Denmark. This holds for men as well as for women. For women in the conservative welfare state of Germany where children are seen as a barrier to female employment, unemployment may be positively related to fertility. For Denmark such a pattern is less likely to hold. *In general, differences in behavior between women and men are expected to be less pronounced in Denmark than in Germany.*

4. Data

4.1. Fertility developments in Denmark and Germany

If one considers the general fertility trends in our two countries, we find that Denmark and Germany share some patterns, but they also differ in several key dimensions. There are also distinct differences between the eastern and western regions of Germany, which need to be highlighted, although we are unable to account for these differences in our empirical investigation. Denmark, East Germany and West Germany all experienced the end of their "secular" fertility transitions during the late 1960s to early 1970s. During this period, fertility rates declined at a rather similar pace in all (at that time) three countries. However, subsequent fertility developments took very different turns in each of these countries. While in West Germany, period fertility rates seem to have frozen at a level of 1.4 children per woman, East German birth rates increased during the 1970s, most likely in reaction to family policies implemented by the East German government (see Fig. 2). After the fall of the Berlin Wall, East German period fertility declined to record low levels, which have only recently recovered to reach current West German levels (Goldstein & Kreyenfeld, 2011). Denmark's

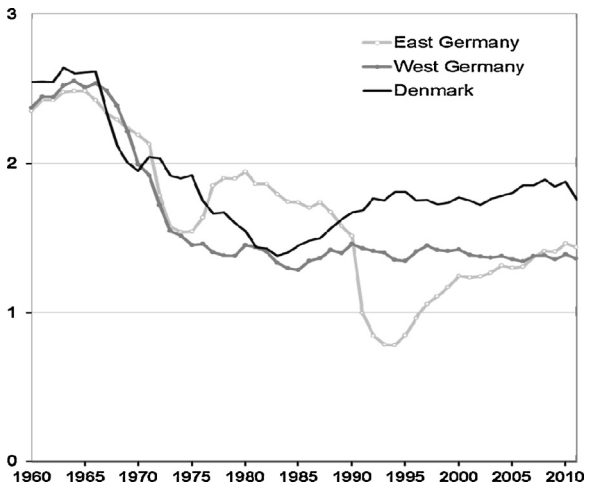

Fig. 2. Total fertility in Denmark, East and West Germany, 1960–2012.
Source: Statistics Denmark (2013a); Human Fertility Database (http://www.humanfertility.org/).

Table 1
Demographic indicators for Denmark and Germany, by calendar year.

	1960	1970	1980	1990	2000	2010
Total period fertility (TFR)						
Denmark	2.54	1.95	1.55	1.67	1.77	1.88
Germany (West)	2.37	2.02	1.44	1.46	1.42	1.39
Germany (East)	2.33	2.19	1.94	1.51	1.24	1.46
Germany	–	–	–	1.45	1.38	1.39
Age at first birth (for women)						
Denmark	23.1	23.7	24.6	26.4	28.1	29.1
Germany (West)	24.9	23.8	25.0	26.6	27.4[b]	29.2
Germany (East)	23.0	22.5	22.3	22.7[a]	26.1[b]	27.4
Germany	–	–	–	–	27.1[b]	28.9

Source: Human Fertility Database, 2013; Kreyenfeld, 2002, 2010; Pötzsch, 2012; Statistics Denmark, 2013a, 2013b.
Notes: Berlin is not always included in the separate representation of data for eastern and western Germany.
[a] 1989.
[b] 2001.

period total fertility followed a trend similar to that of West Germany until the early 1980s, but Danish fertility has increased steadily since that time. The distinct reversal in the period fertility trend in Denmark has been attributed to welfare state reforms and increased efforts by Danish society to integrate mothers into the labor market (Andersson, Kreyenfeld, & Mika, 2009).

It has been suggested that much of the variation in period fertility rates across calendar time is merely due to changes in the ages at which people tend to start their families. However, in this respect, the two comparison countries do not differ greatly. Since the 1970s, Denmark and West Germany have both experienced a gradual increase in the ages of women at first childbearing. In 2010, the average age of a first-time mother was 29 in both Denmark and West Germany. East Germany deviates from this general pattern, however. In the socialist era, the mean age at first birth for women was uniformly low, at about 22. After reunification, the ages at first birth rose sharply, but have not (so far) reached the higher West German age ranges (see Table 1).

With respect to cohort fertility trends, Denmark is the only country of those we study that has had a rather stable and relatively high cohort fertility level in recent time (Andersson, Rønsen et al., 2009; Andersson, Kreyenfeld, et al., 2009). For Danish cohorts born around 1965, an average woman will have given birth to close to 1.9 children. At a much lower end of this scale is Germany: an average German woman of the 1965 birth cohort will have had only 1.5 children. This basically holds for women in both the eastern and the western parts of the country.

4.2. Data for micro-level analysis

For our micro-level analysis, we have access to data from Danish population registers that span the period 1981–2001. These data, which cover the entire resident population of Denmark in each calendar year over this period, contain basic demographic biographies consisting of all registered vital events accurate to the month, including births to women and men. The demographic information is linked to data from administrative registers that produce employment biographies of Danish women and men: Danish taxation registers provide data on annual earnings, unemployment insurance registers provide data on spells of unemployment, and school registers provide data on educational enrollment and educational attainment in any given calendar year.

For Germany, there is, in principle, register data that could be used to study the unemployment and fertility nexus (Kreyenfeld & Mika, 2008). However, these data only include the childbearing histories of women and do not contain sufficiently reliable information on educational characteristics to be of use for our study. For this reason, we have turned to data from the German Socio-Economic Panel (GSOEP) for the analysis of the German situation. The GSOEP is a prospective panel survey that has been conducted annually since 1984 in western Germany and since 1990 in eastern Germany. It includes the complete fertility histories of both the female and the male respondents. However, while the birth histories of the female respondents have been recorded regularly, this has not been the case for male respondents. For males, birth histories have been surveyed for persons who entered the GSOEP since 2001 (Schmitt, 2012c). The survey data also include employment and educational information at the time of each interview. In addition, an event history calendar collects monthly activity histories, which allowed us to assemble an episode dataset with employment and fertility histories for the years 1984–2010.[1] For both Denmark and Germany, we have restricted the study population to women and men of childbearing ages.[2] We have also excluded the foreign-born population from our study to ensure that our results are not distorted by the heterogeneous fertility behavior of international migrants.

[1] We use data from the GSOEP 1984–2011. As the data include activity information for the last year before the survey, the analysis only spans the period 1984–2010.
[2] As teenage childbearing is uncommon in both Germany and Denmark, we have restricted the analysis to ages 20 and above. The upper age limits are 44 for Germany and 43 for Denmark. As there are hardly any events in the data above these ages, we censored them accordingly.

Tables A5 and A6 in the appendix provide the occurrence and exposure distributions by country and birth order for our main variables of educational attainment and labor market status. In total, there are 1,931,861 birth events in the Danish data and 6,142 births in the German data.

4.2.1. Independent variables

The independent variables in our models are age, calendar period, educational attainment, labor market status, and, for second and third births, duration since previous birth. All of the independent variables are treated as categorical time-varying covariates. We have tried to make the data as comparable as possible across countries. However, some country and data-specific features needed to be accounted for. While we were able to control for single ages and single calendar years in the Danish data, we had to group several years and ages in the German data into broader categories due to the much smaller sizes of the sample survey. In the coding of the level of education, we largely followed the ISCED-97 coding scheme to distinguish between "low" (ISCED-level 0–2), "medium" (ISCED-level 3–4), and "high" levels of educational attainment (ISCED-level 5–6).[3]

In both countries, the activity status distinguishes between "in education," "employment", and "unemployment." The German data include monthly updates on the activity status of each individual, while the Danish data contain annual information on labor market outcomes. To make these datasets as comparable as possible, we converted the monthly information in the German data into yearly information.[4] A sensitivity analysis showed that annual and monthly activity information provide rather similar results (not shown, results available upon request). Because a considerable share of German women exit the labor market when they give birth, the activity status for Germany also includes the category "out of the labor market". In Denmark, non-employment (for a full year) is rare. It is, however, quite common for Danish people to have been both unemployed and enrolled in education in the same year. For this reason, there is an additional category that accounts for such multiple activities. Although we classified parental leave periods in the German data as "out of the labor market", we classified periods of parental leave in Denmark as being in employment. This is because the nature of parental leave is radically different in the two countries. In Denmark, periods of parental leave are much shorter than they are in Germany, and they do not constitute a break from employment. For Germany, we also controlled for whether the respondent was resident in eastern or western Germany. While we would have preferred to analyze the two parts of the country separately, small sample sizes did not allow us to do so.[5] In addition, we controlled for the respondent's citizenship in the German data, as foreigners are oversampled in the German Socio-Economic Panel.[6]

4.2.2. Methods

We proceeded in a similar fashion in analyzing the data from both countries. We used employment status in a given calendar year to predict the fertility in the subsequent year using standard event history modeling. Our dependent variable was the transition rate to a first, second, and third child. The baseline hazard for the first birth was the age of the index person; for the second and third births, it was the duration since the last birth, while age was controlled for as a time-varying covariate. The baseline hazard was piecewise constant.[7] All of the analyses were carried out separately for men and women. There are good arguments that suggest that the individual unemployment and fertility nexus of a person who lives in a conjugal union is also influenced by the employment situation of his or her partner. In principle, couple data are available from the GSOEP and from Danish population registers that could be used to adopt a couple approach. There are, however, also benefits to sticking to the individual perspective. A couple approach would, for example, introduce additional complexity in terms of additional steps in the life course analysis we apply, and force us to consider the selection into and out of conjugal unions. Related to this, we would need to address the issue whether economically successful persons are more likely than others to enter co-residential unions in general and marriages in particular.

Our basic research interest focuses on the question of whether there are differences in the unemployment and fertility nexus by age, gender, education, and welfare state. In a first step, we looked at first birth behavior, investigating how unemployment influences first birth decisions at younger (20–28) and older ages (29–44). Next, we investigated how unemployment was related to higher order fertility. Finally, we turned to differences in the unemployment and fertility nexus by education.

5. Results of micro-level analyses

Table 2 contains the summary of results for first births (for the full models, see Tables A1 and A2 in the appendix). Let us first turn to the results on first births for men. We

[3] We slightly modified the classification for Germany. Respondents who earned an "Abitur" but never received a vocational or university degree were coded as having "low education."

[4] Some people were engaged in multiple activities over the year. In the German sample, we prioritized unemployment over educational participation and over employment. In other words, if a person was unemployed and enrolled in education during the same calendar year, we considered this person as having been unemployed for the full calendar year. In the Danish data, we generated a separate category for people who had been both unemployed and enrolled in education in the same year.

[5] The overall patterns seem to be rather similar in both parts of the country (not shown, results available upon request). Due to small sample sizes, however, the results for eastern Germany were either insignificant or only weakly significant.

[6] As we excluded foreign born individuals, this variable mainly picks up whether a person was a second- or third-generation migrant.

[7] In the Danish data, annual episodes were used. In the German data, the splits for first childbearing were at ages 23, 25, 27, 29, 31, 33, 35, and 39; for second and third births, splits were introduced at durations 1, 2, 4, and 6 years since previous birth.

Table 2
Relative risks of first births of the unemployed (vs. the employed), by age group and country.

	Men	Women
Denmark		
First birth (ages 20–28)	0.99	1.17
First birth (ages 29–43)	0.77	0.92
Germany		
First birth (ages 20–28)	0.77*	1.11
First birth (ages 29–44)	0.57***	0.73**

Note: For Denmark, no significance levels are given, as the data cover the entire resident population. For the full model, see Tables A1 and A2 in the appendix.
* $p < 0.10$.
** $p < 0.05$.
*** $p < 0.01$.

expected to find that male unemployment generally led to the postponement of fatherhood. Our results largely supported this notion. However, we also detected a clear variation in the strength of this association by men's ages. Contrary to our expectations, we found that it was not youth unemployment that was most detrimental to family formation, but unemployment at more advanced ages. In Denmark, unemployment was unrelated to first birth rates among young men, but an association between first birth rates and unemployment was shown to exist among older men. Indeed, the effect of unemployment was quite substantial among older men, lowering first fatherhood rates in Denmark by about a quarter. For Germany, we found that male unemployment lowered first birth rates at all ages. However, in Germany as well, the effect was shown to have been strongest at later ages. First fatherhood risks were almost cut in half if a man was unemployed at ages 29–44.

For women, we found equally clear differences by age groups for both Germany and Denmark. At younger ages, unemployment was unrelated to first motherhood in Germany, and it was even positively related in Denmark. At older ages, however, unemployment was associated with lower first birth risks in both countries. In Denmark, it reduced first birth rates by some eight percent in this age bracket. In Germany, the effect was very strong, reducing first birth rates by about 30 percent.

Table 3
Relative risks of second and third births among the unemployed (vs. the employed) in Denmark and Germany.

	Men	Women
Denmark		
Second birth	0.85	0.98
Third birth	1.09	1.14
Germany		
Second birth	0.67***	1.14
Third birth	1.66**	1.40**

Note: For Denmark, no significance levels are given, as the data cover the entire resident population. For the full model, see Tables A3 and A4 in the appendix.
* $p < 0.10$.
** $p < 0.05$.
*** $p < 0.01$.

Table 3 provides the results for second and third births (for the full models, see Tables A3 and A4 in the appendix). Let us again first turn to the results for men. We expected to find that male unemployment would decrease the likelihood of having a larger family. This hypothesis was not fully confirmed by our data. In both Denmark and Germany, unemployed two-child fathers were shown to have had higher risks than employed fathers of having another (third) child. Of the higher birth orders we cover, only second birth rates were found to have been negatively affected by male unemployment. In the case of Denmark, second birth rates were reduced by 15 percent among unemployed men. In Germany, the magnitude seems to have been slightly greater.

Looking at the results for women, we found that maternal unemployment in Denmark was unrelated to second birth rates, but, just as for men, it was positively related to third birth risks. In Germany as well, female unemployment seems to have been positively associated with third birth rates. Moreover, we noted that the two countries differed considerably in terms of the employment patterns of women after they had their first child. In (western) Germany, many women exited the labor when they entered motherhood (see Table A6 in the appendix). The group of *non-employed* women in Germany were shown to have had by far the highest second and third birth intensities (results displayed in Table A4 in the appendix).

In a final step, we investigated whether there were differences in the unemployment and fertility nexus by women and men's level of education. Fig. 3a displays the results for Danish women. We had hypothesized that female unemployment leads to fertility postponement among highly educated women, but not necessarily among less educated women. This assumption was supported by our analysis. We even find that young less educated unemployed women (ages 20–28) had strongly elevated first birth risks. Compared to employed young low educated women, their first birth rates were elevated by almost 50 percent. This specific group of women apparently responded to unemployment by entering motherhood. For the other educational groups, we found that female unemployment was unrelated or negatively related to first birth fertility. The negative association was particularly strong among women with a tertiary education. Among these women, first birth risks were reduced by almost 20 percent when they were unemployed. We find this pattern at lower as well as higher ages. It is worth to recall that tertiary educated people only leave the educational system when they are in their mid or late twenties. For highly educated persons, the age bracket 20–28 therefore represents the period of labor market entry. Apparently, unemployment at labor market entry as well as later life course stages is highly detrimental for the fertility of the highly educated.

We also found a clear educational gradient in the association between unemployment and fertility for second and third births. Second births were postponed when a woman with a medium or high level of education was unemployed. By contrast, an unemployed woman with a low level of education had a slightly elevated second birth risk. For third births, we found that unemployment increased birth risks for all educational

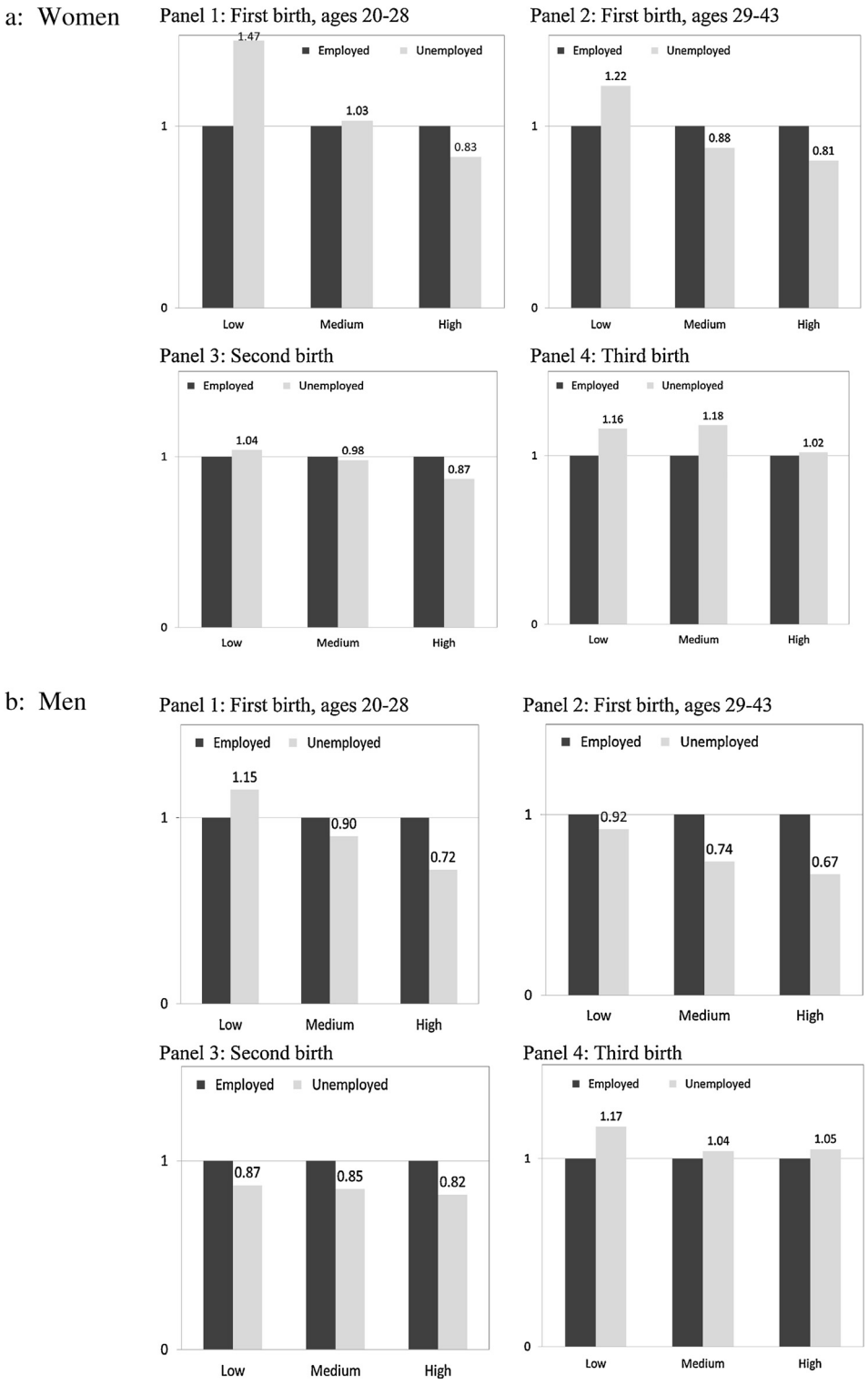

Fig. 3. (a) Relative childbearing risks by unemployment vs. employment, for women in Denmark with different levels of education. (b) Relative childbearing risks by unemployment vs. employment, for men in Denmark with different levels of education. *Note*: No significance levels are given, as the data cover the entire resident population. Standardized for calendar year, age, and duration since last previous birth (in the second and third birth model). Other factor levels are: ''in education'' and ''in education and unemployment''.
Source: Danish Population Registers 1981–2001, author's own calculations.

groups. However, we again found differences by level of education. Among unemployed mothers with medium and low levels of education, the risk of having a third birth was elevated by 16–18 percent. Among unemployed mothers with a high level of education, it was elevated by just two percent.

The results for Danish men are reported in Fig. 3b. We expected to find that the unemployment and fertility nexus would vary by a woman's level of education, because of the heterogeneity in women's career aspirations. Men, of course, also vary in their career aspirations. However, the ability of men to opt out of the labor market to care for children has remained limited in most societies. For this reason, we have assumed that differences by men's level of education would be more moderate than for females. Interestingly, we found that there was a strong educational gradient in the unemployment and fertility nexus for males as well. Young men with low levels of education who were unemployed had elevated first birth risks. Compared to employed young men with similar education levels, their first birth risks were 15 percent higher. This association was not as strong as it was for the corresponding group of women. Nevertheless, it was intriguing to find that the most vulnerable group of less educated young men—i.e., those who were unemployed—were the ones who were most likely to become a father. For other groups of childless men, unemployment was found to have lowered their first birth rates. Like for women, this association was shown to have been strongest among highly educated men: their first birth risks were reduced by 28–33 percent when being unemployed. For second births, we found only a modest educational gradient in the same direction. The results also indicated, however, that male unemployment increased the risk of having a third birth. Among less educated fathers with two children, the parity progression rates of the unemployed were elevated by some 17 percent, compared to four percent among medium educated men and by five percent among highly educated men.

For Germany we also studied the interaction of education and employment status. Due to the small sample sizes, we did not break down the first birth rates by age groups, but simply estimated our first birth models for all ages combined. We do not present these results in a graph because some of the results were insignificant, but Table 4 gives the results together with significance levels.

On the whole, the educational gradient in the female unemployment and first birth nexus that we observed for Denmark was also supported in the German sample. Female unemployment was found to have been unrelated to first childbearing among less and medium educated women. Among highly educated women who were unemployed, first birth risks were found to have been 37 percent lower. For second and third births, the pattern was a bit more irregular. We found that unemployment or non-employment was unrelated to fertility transitions among highly educated women, but that it increased birth risks among medium and less educated women. For men, we found somewhat less clear gradients but generally in the same direction as for women. Medium educated men had reduced first and second birth risks during periods of unemployment, but less educated men did not. For third births, we found a significant positive association between unemployment and third childbearing among medium educated men, but not among the highly educated. It is important to note, however, that the group of unemployed men who had a third child was extremely small. In the total sample, we only observed 39 such cases. We can thus clearly see the limitations of social science surveys when the goal is to understand the fertility behavior of relatively small population subgroups.

Table 4
Relative childbearing risks by employment status, for women and men in Germany with different levels of education.

	Low education	Medium education	High education
Women			
First birth, women			
Employed	1	1	1
Unemployed	1.11	0.96	0.63*
Second birth, women			
Employed	1	1	1
Unemployed	1.05	1.18*	0.66
Not in labor market	1.32*	1.59***	0.93
Third birth, women			
Employed	1	1	1
Unemployed	1.30	1.46*	0.60
Not in labor market	1.33	1.80***	1.10
Men			
First birth, men			
Employed	1	1	1
Unemployed	0.79	0.63***	0.67
Second birth, men			
Employed	1	1	1
Unemployed	0.77	0.70**	0.60
Third birth, men			
Employed	1	1	1
Unemployed	1.36	1.67**	0.80

Source: GSOEP 1984–2011, authors' own calculations.
Note: Standardized for calendar year, age, region (East/West Germany), citizenship, and duration since last previous birth (in the second and third birth models). Other control variables are a flag variable for "in education" and one for "missing level of education."
* $p < 0.10$.
** $p < 0.05$.
*** $p < 0.01$.

6. Conclusion

This study has focused on the different fertility responses to unemployment. Drawing on longitudinal data from Denmark and Germany, we examined how the unemployment and fertility nexus varied by birth order, age, educational attainment, and gender. In many respects, our research confirmed general expectations and prior research on the matter. We found that male unemployment lowered first and second birth fertility. This pattern seems to be stronger in Germany than in Denmark which is compatible with the idea of Germany being a conservative welfare regime where a stable economic position of the male breadwinner is a prerequisite for having children. It is furthermore compatible with the possibility that the more universal social security of Denmark and its more flexible labor market help to cushion the negative effects of own

unemployment that otherwise might discourage family formation. The role of female unemployment in first and second birth behavior was less clear, with our study showing some negative association with first births, but no relationship with second birth behavior.

Taking a life-course perspective, we explored how the association of unemployment with first childbearing differed by age. We relied on the hypothesis that youth unemployment leads to substantial biographical uncertainties as unemployed young people are confronted with fears of not getting a foothold in the labor market. That youth unemployment should be detrimental for fertility choices also stems from observations based on macro-level data showing that increases in unemployment rates are related to reduced aggregate fertility at younger ages (Goldstein et al., 2013). Our micro level investigation casts a different light on these findings. We have shown that it is not youth unemployment, but own unemployment at later ages (ages 29–44) which makes people postpone parenthood. These age patterns were remarkably similar for both genders and both countries. Apparently the individual experience of unemployment and that of changes in unemployment at the macro-level of society constitute entirely different dimensions of uncertainty. At the higher reproductive ages, individual unemployment is much less common than at the younger ages and seems to appear as a more disturbing experience.

For third births we found very similar associations of men and women's unemployment with continued childbearing. For both countries mother's as well as father's unemployment was positively related to the propensity to have a third child. While the results for women may come as less of a surprise, the results for men call for further explanation. Apparently, some men are rather relaxed about their role as breadwinners, maybe because they rely on social benefits or on the high income of their spouse. Our results may also point to the role of unobserved characteristics in the population who is unemployed and at risks of having a third child. Unemployed two-child parents may differ from employed parents in terms of how strictly they plan their working life, childbearing and contraceptive behavior. Whatever the right interpretation, our results challenge the idea that a stable male employment career is a prerequisite for having a larger than average family.

Our main hypothesis revolved around the idea that the association of unemployment and fertility should not only vary by age and parity, but also by socio-economic status. Drawing on the concepts of Friedman et al. (1994), we particularly argued that less educated women may be less reluctant to have children during unemployment, because they may perceive motherhood as a biographical alternative to the limited employment options that are presented to them. Conversely, we asserted that highly educated women, who are assumed to be more attached to the labor market and interested in having a career, may be more likely to postpone fertility choices when they are unemployed. This hypothesis was largely supported by the results from our empirical analyses. Our study revealed a clear educational gradient in the unemployment-fertility nexus that appeared most strongly for first births, but largely held for all birth orders in both countries.

Moreover, the educational gradient appeared equally clear for men as for women. Our results showed that both women and men with high education postpone first parenthood when being unemployed. For low educated women and men, we did not find the same association. In particular for Denmark we found a clearly positive association of unemployment and first birth fertility of young women and men with low educational attainment. We interpreted the finding against the background of the different labor market prospects that are available to the unemployed depending on their level of education. For highly educated people, regardless of gender, unemployment is a relatively rare event that is likely to soon be followed by more stable employment. It appears rational then to postpone having children until the employment situation has improved. For the less educated, periods of unemployment are a more regular experience which may act less as a deterrent for having children. Taken together, our findings on elevated fertility among unemployed two-child fathers and the similarity in educational and age gradients in the unemployment-fertility nexus for women and men challenge theories that predict strongly gendered patterns in the relationships between labor market factors and childbearing behavior.

To sum up, our study provided quite consistent results in terms of age, parity and educational gradients in the unemployment-fertility nexus in two very different welfare regimes in Europe. We showed that different socio-demographic subgroups of a population differ greatly in how they adjust their childbearing behavior in response to unemployment. Still, we had to leave several issues unexplored. We were not able to consider the potentially pivotal role of a partner's employment situation. Further variables that were unavailable to us, like those related to contraceptive behavior, may offer additional insight into the relationships we studied. Nevertheless, our contribution brings attention to the issue that individuals differ in how they consider unemployment a suitable situation for having children. An investigation of the subsequent life courses of women and men who have children under seemingly adverse economic conditions might help illuminate these phenomena further.

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Appendix A

See Tables A1–A6.

Table A1
First birth risks, results from piecewise constant event history model, Denmark.

	Men		Women	
	Ages 20–28	Ages 29–43	Ages 20–28	Ages 29–43
Level of education				
Low	1	1	1	1
Medium	0.99	1.61	0.82	1.64
High	1.04	2.07	1.01	2.10
Activity status				
In education	0.46	0.78	0.44	0.74
Unemployed	0.99	0.77	1.17	0.92
Education & unemployed	0.62	0.64	0.81	0.77
Employed	1	1	1	1
Number of cases				
Person-months	68,509,800	39,155,130	53,456,848	21,586,802
Events	237,972	232,274	322,377	146,046

Source: Danish Population Registers 1981–2001, authors' own calculations.
Note: No significance levels are given, as the data cover the entire resident population. Standardized for calendar year and age.

Table A2
First birth risks, results from piecewise constant event history model, Germany.

	Men		Women	
	Ages 20–28	Ages 29–44	Ages 20–28	Ages 29–44
Level of education				
Low	1	1	1	1
Medium	1.36***	1.18	1.21**	1.18
High	1.04	1.65***	0.82	1.39**
Activity status				
In education	0.40***	0.78**	0.34***	0.63***
Unemployed	0.77*	0.57***	1.11	0.73**
Out of labor market	0.62	–	1.26***	0.66
Employed	1	1	1	1
Number of cases				
Person-months	198,267	192,864	219,641	126,418
Events	471	838	1,021	680

Source: GSOEP 1984–2011, authors' own calculations.
Note: Standardized for calendar year, age, citizenship, and region (eastern or western Germany). A flag variable for missing education was used as well.
* $p < 0.10$.
** $p < 0.05$.
*** $p < 0.01$.

Table A3
Second and third birth risks, results from piecewise constant event history model, Denmark.

	Men		Women	
	Second birth	Third birth	Second birth	Third birth
Level of education				
Low	1	1	1	1
Medium	1.18	0.91	1.19	0.95
High	1.50	1.16	1.59	1.55
Activity status				
In education	0.87	1.16	0.74	0.95
Unemployed	0.85	1.09	0.98	1.14
Education & unemployed	0.75	1.15	0.79	0.97
Employed	1	1	1	1
Number of cases				
Person-months	28,157,425	33,306,353	28,776,079	38,435,394
Events	359,413	118,848	388,786	126,145

Source: Danish Population Registers 1981–2001, authors' own calculations.
Note: No significance levels are given, as the data cover the entire resident population. Standardized for calendar year, age and duration since last previous birth.

Table A4
Second and third birth risks, results from piecewise constant event history model, Germany.

	Men		Women	
	Second birth	Third birth	Second birth	Third birth
Level of education				
Low	1	1	1	1
Medium	1.02	1.08	1.20**	0.87
High	1.88***	1.78**	2.55***	2.00***
Activity status				
In education	0.79*	0.84	0.84	0.90
Unemployed	0.67***	1.66**	1.14	1.40**
Out of labor market	1.23	1.44	1.56***	1.61***
Employed	1	1	1	1
Number of cases				
Person-months	133,911	139,006	204,064	243,979
Events	1,001	314	1,350	467

Source: GSOEP 1984–2011, authors' own calculations.
Note: Standardized for calendar year, age, duration since last previous birth, citizenship and region (eastern or western Germany). A flag variable for missing education was used as well.
* $p < 0.10$.
** $p < 0.05$.
*** $p < 0.01$.

Table A5
Person-months of exposure in percent (Exp) and number of occurrences (Occ), Denmark.

	First birth				Second birth		Third birth	
	Ages 20–28		Ages 29–43		Ages 20–43		Ages 20–43	
	Exp	Occ	Exp	Occ	Exp	Occ	Exp	Occ
Men								
Level of education								
Low	40%	81,271	32%	45,854	29%	88,215	25%	32,645
Medium	55%	135,764	47%	119,114	53%	190,605	53%	58,850
High	6%	20,937	21%	67,306	18%	80,593	22%	27,353
Activity status								
In education	38%	38,681	7%	17,968	7%	21,659	3%	4,678
Unemployed	19%	61,399	20%	37,123	21%	64,966	16%	20,538
Education & unemployed	8%	12,765	3%	5,262	3%	6,996	1%	1,448
Employed	35%	125,127	70%	171,921	69%	265,792	80%	92,184
Total	100%	237,972	100%	232,274	100%	359,413	100%	118,848
Women								
Level of education								
Low	34%	113,469	29%	23,386	35%	120,547	34%	46,989
Medium	58%	164,594	39%	61,216	43%	168,333	41%	45,622
High	8%	44,314	32%	61,444	22%	99,906	24%	33,534
Activity status								
In education	43%	65,189	10%	15,361	11%	33,457	7%	8,622
Unemployed	15%	79,744	16%	23,205	26%	107,044	22%	34,527
Education & unemployed	12%	36,077	4%	6,284	7%	23,346	4%	5,762
Employed	30%	141,367	70%	101,196	57%	224,939	67%	77,234
Total	100%	322,377	100%	146,046	100%	388,786	100%	126,145

Source: Danish Population Registers 1981–2001, authors' own calculations.

Table A6
Person-months of exposure in percent (Exp) and number of occurrences (Occ), Germany.

	First birth		Second birth		Third birth	
	Exp	Occ	Exp	Occ	Exp	Occ
Men						
Level of education						
Low	30%	195	9%	105	8%	28
Medium	55%	818	74%	648	73%	208
High	12%	260	13%	217	16%	69
Missing	2%	36	4%	31	3%	9
Activity status						
In education	30%	180	7%	73	4%	14
Employed	56%	996	82%	853	88%	259
Unemployed	13%	128	10%	70	8%	39
Out of labor market	1%	5	0%	5	0%	2
Total	100%	1,309	100%	1,001	100%	314
Women						
Level of education						
Low	34%	329	15%	224	13%	98
Medium	52%	1,095	74%	904	75%	303
High	12%	239	8%	185	8%	53
Missing	2%	38	3%	37	4%	13
Activity status						
In education	34%	245	5%	62	3%	12
Employed	54%	1,209	64%	680	61%	184
Unemployed	11%	223	13%	180	11%	56
Out of labor market	2%	24	18%	428	25%	215
Total	100%	1,701	100%	1,350	100%	467

Source: GSOEP 1984–2011, authors' own calculations.

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