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Socioeconomic Differences in the Unemployment and Fertility Nexus: A Comparison of Denmark and Germany

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Abstract

Studies that have investigated the role of unemployment in childbearing decisions have often provided conflicting results. We argue that many of the inconsistencies of prior research may be attributed to a neglect of group-specific differences in behavior. In this study, we examine how the effects of unemployment on fertility vary by socio-demographic subgroups using data from the German Socio-Economic Panel (GSOEP) and from Danish population registers. We find that male unemployment leads to a postponement of first and second childbearing in both countries. The role of female unemployment is less clear at these 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.

Keywords: Education, event history, fertility, unemployment

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; Mills & Blossfeld, 2003; Neels, 2010; Özcan, Mayer, & Luedicke, 2010; Pailhé & Solaz, 2012; Perelli-Harris, 2006; Schmitt, 2012a; Sobotka, Skirbekk, & Philipov, 2011). This study adds to this literature by investigating whether responses to economic uncertainties are homogenous across social strata, or whether different population subgroups react differently when exposed to adverse economic conditions. In particular, we examine how the unemployment and fertility nexus varies by parity, gender, age, education, and welfare state. We have chosen to focus on Denmark and Germany, two countries that represent very different 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 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. Our

study expands on earlier research in which education-specific differences in the relationship between economic uncertainties and fertility were found for women in Germany (Kreyenfeld, 2010). It also builds upon previous research on socioeconomic differences in fertility responses to the implementation of different policies in Europe (Boccuzzo et al., 2008; Schellekens, 2011). We extend previous research by studying cross-national differences in behavior and by including men in our study populations. The remainder of this paper is organized as follows. The next section provides an overview of previous micro-level studies that address the unemployment and fertility nexus. We then elaborate on why we expect to find group-specific differences in behavior. The next section provides background information on the Danish and the German institutional contexts, and a brief summary of labor market developments in these countries. This is followed by a description of our data and 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 Background

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, et al., 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. Some studies have found a negative relationship between female *non-employment* and first birth rates in the Nordic countries, the post-socialist countries, and France (Andersson, 2000;

Matysiak, 2009; Matysiak & Vignoli, 2008). But studies that focus on the role of *unemployment* have shown that female unemployment is unrelated or even positively related to first birth transitions in different contexts in 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, 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 social policies of countries, the findings for higher order births have tended to be 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 male unemployment is positively associated with transitions to third or fourth births in Norway. Andersson and Scott (2007) reached a similar conclusion for third births in Sweden. Gerster and Lappegård (2010) found elevated third birth rates for unemployed women in Norway, and similar results have been reported for Sweden by Andersson (2000). These findings are quite astonishing 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 an important factor in the decision to have an above-average family size.

3 Theoretical Considerations

There may be many reasons for the lack of a strong relationship between individual unemployment and fertility. First, we could posit that economic factors are generally unimportant for understanding fertility variation, and that ideational factors are more relevant (Lesthaeghe, 2010). Alternatively, 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 uncertainty about the prospects for future employment, which may be only loosely related to the current employment status. Finally, and probably most importantly, we could assert that current unemployment is not necessarily a good indicator of economic uncertainty, because unemployment it is not a "random" experience. A large body of labor market literature has shown that men and women who are unemployed are a select group of people who also differ in many other dimensions from the employed population (e.g., Oesch 2010). In addition, people vary in their degree of labor market commitment and job search behavior. In particular, if a woman becomes unemployed, she may refrain from looking for a new job if she is preparing to start a family. Because some women adjust their employment behavior in anticipation of motherhood, a positive association between female unemployment and fertility may be found at the micro level.

Whether and to what extent women adjust their employment in anticipation of motherhood will depend on the expectations women have about their future employment paths. In the literature, women who are young, less educated, and otherwise

disadvantaged are often been assumed to be more likely than others to have children under seemingly adverse economic conditions. McDonald (2000) attributed this tendency to the low opportunity costs of childrearing for women in this group: "[N]othing is lost by having children because they have no opportunity to succeed in the mainstream economy" (ibd. 2000: 10). In their well-cited study on the "value of children and marriage", Friedman, Hechter, and Kanazawa (1994) framed fertility and nuptiality decisions in a broader context of labor discouragement and biographical uncertainty. They argued that less educated and disadvantaged young women only appear 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. In societies where motherhood and employment are alternative life options for women, motherhood can be a strategic choice to evade unpleasant choices in the employment domain of the life course. In such a situation, the decision to either have a career or to rely on support from a male partner may come into play.

In most European countries, the traditional male breadwinner model has eroded as women have moved into the labor market in great numbers (Drobnic, Blossfeld, & Rohwer, 1999). However, this family model still has not disappeared completely from the scene. In fact, the full-time employment of mothers is still rare in most Western European countries (Thévenon & Horko, 2009). Consequently, some women might continue to regard motherhood and full-time employment as alternative and competing life options. Others may be more eager to embrace the opportunity of combining work and family life, and will choose a career that allows them to balance work and family commitments. If women differ in their perceptions of their employment options, they may also differ in the ways they react to employment uncertainties.

In this study, we put this hypothesis to the test and examine how the unemployment and fertility nexus varies across different socio-demographic subgroups of the populations. More specifically, we analyze how current unemployment relates to first, second, and third birth rates, and how this relationship varies by age, level of education, and welfare state context. We contrast behavior in two very different welfare regimes: Denmark and Germany. We expect to find that highly educated women in particular will delay parenthood when they are unemployed, while less educated women will be more prone to have children when they are jobless. In addition, we carry out the same set of analyses for men in the two countries we study. For men, we would expect to find that unemployment leads to lower fertility. Even with increasing maternal employment rates, men are still expected to act as breadwinners. Generally, they are not seen as having a choice between pursuing a career or having children. Thus, if a man's labor market situation is insecure,

he may be expected to postpone starting a family. This should be particularly true in a male breadwinner regime like that of Germany.

Fertility Dynamics in Denmark and Germany

In terms of their demographic situations, our two comparison countries share some patterns, but they also differ in several key dimensions. There are also distinct differences between the eastern and western regions of Germany. 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 the population policies initiated by the East German government. After the fall of the Berlin Wall, East German period fertility declined to record low levels, and have only recently increased again to reach the current West German levels (Goldstein & Kreyenfeld, 2011). Denmark's period total fertility followed a trend similar to that of West Germany until the early 1980s, but has been rising steadily since then. The distinct reversal in the period fertility trend in Denmark has been attributed to welfare state reforms and increased efforts by the Danish government 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 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 Denmark and 30 in West Germany.[1]

With respect to cohort fertility trends, Denmark is the only country out of those we are studying that has had a rather stable and relatively high cohort fertility level in recent years (Andersson et al., 2009). For the Danish cohorts born around 1965, an average woman will have given birth to close to 1.9 children. At the 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.

[1] 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 (see Table 1). After reunification, the ages at first birth rose sharply, but have not (so far) reached the very high West German age ranges.

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	26.4	26.6	27.4**)	30.1
Germany (East)	23.0	22.5	22.3	22.7*)	26.1**)	29.4
Germany	--	--	--	--	27.1**)	30.0

Notes: Berlin is not always included in the separate representation of data for eastern and western Germany. *) 1989 **) 2001

Source: Human Fertility Database, 2013; Kreyenfeld, 2002; Kreyenfeld et al., 2010; Pötzsch, 2012; Statistics Denmark, 2013a, 2013b.

Welfare State Context, Employment, and Unemployment

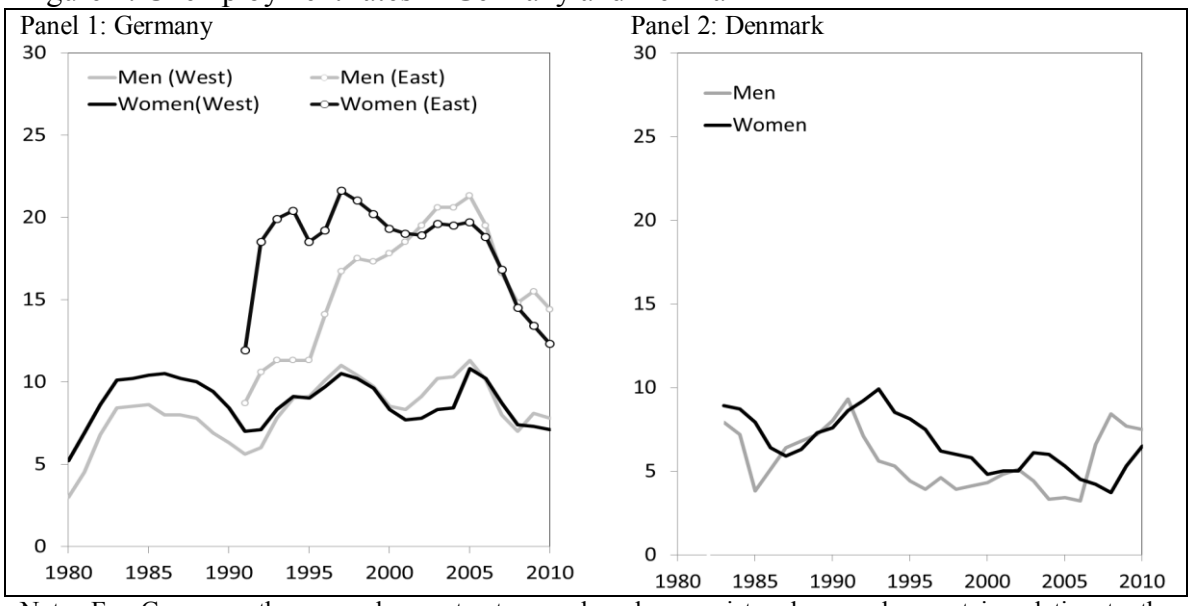
Denmark and Germany represent very different ideal welfare state regime types. Germany is an archetypical conservative welfare regime. For decades, the traditional male breadwinner family model has been fostered by the German tax and transfer system, and employment rates among German women have been 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 & Seeleib-Kaiser, 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 remain very different (Bauernschuster & Rainer, 2012). Despite the fact that the risk of unemployment has been and continues to be an issue for East German women (see Figure 1), their labor market attachment remained high even 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 universal 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 gender-equal dual earner society (Bruning & Plantenga, 1999; Ellingsæter, & Leira, 2006; Ellingsæter, 2009; Obinger et al., 2010). Nevertheless, Denmark still has one of the highest maternal full-time employment rates in Europe (OECD 2012). 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 Figure 1).

Figure 1: Unemployment rates in Germany and Denmark



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).

4 Data & Methods

Data

For Denmark, we have access to data from 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.[2] We have restricted the study population to women and men of childbearing ages.[3] 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. Tables A5-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.

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),

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[2] 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.

[3] 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.

"medium" (ISCED-level 3-4), and "high" levels of educational attainment (ISCED-level 5-6).[4]

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.[5] A sensitivity analysis showed that annual and monthly activity information provide rather similar results (see Table A7 in the appendix). A sensitivity analysis based on the Danish data showed that a higher degree of unemployment during a calendar year was generally related to more strong coefficients for the effects of unemployment in childbearing behavior (see Table A8 in the appendix). Because a considerable share of German women exit the labor market when they give birth, the variable 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

[4] 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."

[5] 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.

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. In addition, we controlled for the respondent's citizenship in the German data, as foreigners are oversampled in the German Socio-Economic Panel.[6]

Methods

We proceeded in a similar fashion in analyzing 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. 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

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

his or her partner. In principle, couple data are available from the GSOEP and from Danish population registers that could be used to investigate this issue. However, since we did not have these data readily available for both countries, we reverted to individual data for women and men in our analyses.

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). Most of the life course literature that studies the role of economic uncertainties in fertility dynamics presumes that it is youth unemployment in particular that leads people to postpone their fertility plans (Mills & Blossfeld, 2003). For this reason, we expected to find that the impact of unemployment was particularly strong at younger ages. After we investigated the age-unemployment nexus for first births, we examined how unemployment was related to higher order fertility. We expected to find that male unemployment in particular lowered higher order birth risks, because having a secure economic situation is assumed to be a prerequisite for having a larger family. We further analyzed the differences in patterns by women's and men's education levels. Our main research hypothesis resolves around the idea that highly educated women will tend postpone parenthood when they are unemployed, whereas less educated women will tend to have elevated first-birth fertility while jobless, because motherhood may represent an alternative track out of an insecure employment career. At the higher birth orders, we expected to see for women less pronounced socioeconomic differentials in the unemployment-fertility nexus. For men, we expected to find that unemployment generally led to reduced fertility, as men's

options for leaving the labor market to care for children are relatively limited, and their lack of employment is associated with a much less secure economic situation for the family. This should hold for men in all socioeconomic groups.

5 Results

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 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 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 2: Relative risks of first births of the unemployed (versus 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: *** p<0.01; ** p<0.05; * p<0.10. 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.

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 child. Of the higher order births, 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 it was positively related to third birth risks. In Germany, female unemployment also 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).

Table 3: Relative risks of second and third births among the unemployed (versus 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: *** p<0.01; ** p<0.05; * p<0.10. 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.

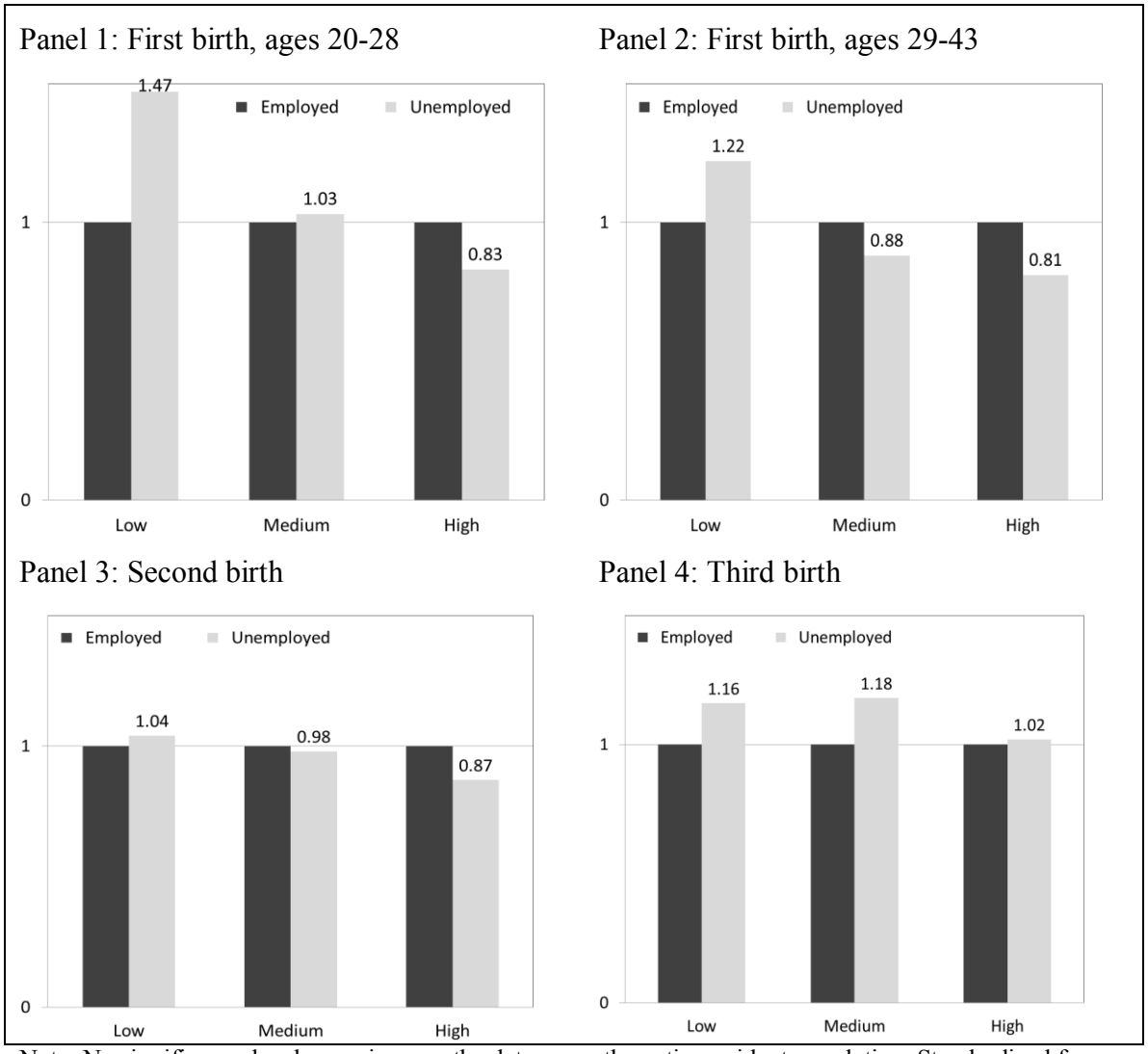
In a final step, we investigated whether there were differences in the unemployment and fertility nexus by women and men's level of education. Figure 2a displays the results for Danish women. We had hypothesized that female unemployment leads to fertility postponement among highly educated women in particular. This assumption was largely

supported by our analysis. In contrast, younger, less educated unemployed women (ages 20-28) were shown to have had strongly elevated first birth risks. Compared to employed young women with a low educational attainment, 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 generally related to reduced first birth rates. The negative association was shown to have been strongest among women with a tertiary education. Among these women, first birth risks were reduced by almost 20 percent when they were unemployed. 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 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 Figure 2b. 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 would assume that men's unemployment would generally lead to reduced fertility rates. 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 comparable 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 astonishing 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 fathers. 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 they were unemployed. When we looked at second births, we consistently found that male unemployment also lowered the transition rate to a second child. For second births, we found only a modest educational gradient. 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.

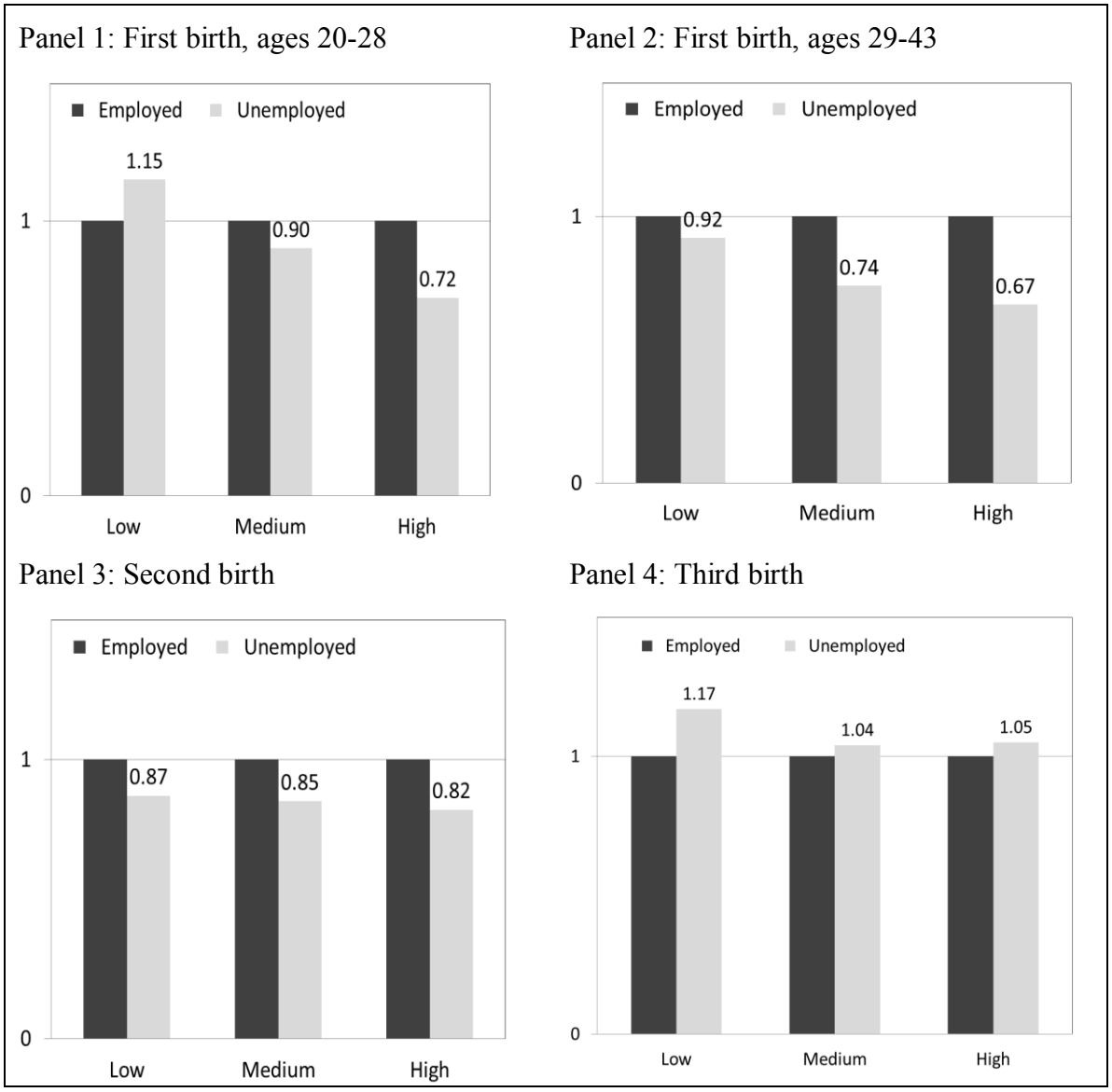
Figure 2a: Relative childbearing risks by unemployment vs. employment, for women in Denmark with different levels of education



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.

Figure 2b: 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.

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

Women	**Low education**	**Medium education**	**High education**
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	**Low education**	**Medium education**	**High education**
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

Note: *** p<0.01; ** p<0.05; * p<0.10. Standardized for calendar year, age, region (East/West Germany), citizenship, and duration since last previous birth (in the second and third birth models). Other factor levels are in education and missing level of education.

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

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 varies by birth order, age, educational attainment, and gender. Our main hypothesis revolved around the idea that male unemployment generally leads to reduced fertility, while the effects of female unemployment are more heterogeneous. Drawing on the concepts of Friedman et al. (1994), we 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.

Our analyses revealed strong variations in the unemployment and fertility nexus by gender, age, and parity. The relationship between unemployment and starting a family also appeared to be more negative in Germany than in Denmark. We speculate that the more universal social security of Denmark and its more flexible labor market help to cushion the negative effects of unemployment that might discourage family formation. Nevertheless, a systematic pattern seemed to emerge across the two countries we studied. In both countries, unemployment was more negatively related to first birth risks at the older than at the younger ages. In both countries, male unemployment was also more negatively related to fertility than female unemployment. We found that male unemployment led to a reduction in the first and second birth rates in both Denmark and

Germany. For third births, however, fertility was elevated for unemployed men in both countries. For female unemployment, the patterns in first and second birth risks were less clear. Second birth rates appeared to be unrelated to maternal unemployment. For third births, fertility was elevated for unemployed women as well. Most importantly, the analysis showed that an educational gradient existed in the association between unemployment and fertility. This largely held for both sexes at all birth orders and for women and men in Denmark as well as in Germany.

Even though these patterns largely appear to be systematic across the two countries we studied, some results need further interpretation. We expected to find some variation in the unemployment and fertility nexus by woman's educational attainment. Not only was this assumption supported by our study, but, surprisingly, we also found similar variations in the unemployment-fertility association by educational attainment among men. In addition, we found that a father's (and, less surprisingly, a mother's) unemployment was rather positively related to the propensity to have a third child. These findings appear to challenge theories that predict strongly gendered patterns in the relationships between childbearing behavior and various labor market and socioeconomic factors. How can we then explain the patterns of elevated fertility among unemployed two-child fathers and the relatively weak effects of unemployment on the fertility of less educated men? Obviously, some men may consider unemployment a suitable situation for having children, and may therefore seemingly reject the role of male breadwinner. It is possible that these men live with high-income women, and are therefore able to opt out of the labor market to care for their children. Another, more likely explanation is that many of these men have poor labor market prospects, and intend to rely on social benefits when

having children. The observed patterns may also be due to differences between educational groups in planning for pregnancies and childbearing.

This study has provided quite consistent results in terms of 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. We speculated that the observed patterns may relate to differences in the biographical alternatives that are available to different subgroups of the populations. Further investigation of the life courses of women and men who have children under seemingly adverse economic conditions might help to illuminate these phenomena.

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Appendix

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

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

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	

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

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

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

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	

Note: *** p<0.01; ** p<0.05; * p<0.10. 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.
Source: GSOEP 1984-2011, authors' own calculations.

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

Men	**First birth**				**Second birth**		**Third birth**	
	Ages 20-28		**Ages 29-43**		**Ages 20-28**		**Ages 29-43**	
	Exp	**Occ**	**Exp**	**Occ**	**Exp**	**Occ**	**Exp**	**Occ**
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	**First birth**				**Second birth**		**Third birth**	
	Ages 20-28		**Ages 29-43**		**Ages 20-28**		**Ages 29-43**	
	Exp	**Occ**	**Exp**	**Occ**	**Exp**	**Occ**	**Exp**	**Occ**
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

Men	**First birth**		**Second birth**		**Third birth**	
	Exp	**Occ**	**Exp**	**Occ**	**Exp**	**Occ**
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%	1309	100%	1001	100%	314
Women	**First birth**		**Second birth**		**Third birth**	
	Exp	**Occ**	**Exp**	**Occ**	**Exp**	**Occ**
Level of education						
Low	34%	329	15%	224	13%	98
Medium	52%	1095	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%	1209	64%	680	61%	184
Unemployed	11%	223	13%	180	11%	56
Out of labor market	2%	24	18%	428	25%	215
Total	100%	1701	100%	1350	100%	467

Source: GSOEP 1984-2011, authors' own calculations

Table A7: Sensitivity analysis of the relative risks of first, second, and third births among unemployed (versus employed), women and men in Germany

Men	**Annual**		**Monthly**	
First birth (Ages 20-28)	0.77	*	0.81	
First birth (Ages 29-44)	0.57	***	0.74	
Second birth	0.67	***	0.87	
Third birth	1.66	**	1.66	*
Women	**Annual**		**Monthly**	
First birth (Ages 20-28)	1.11		1.42	***
First birth (Ages 29-44)	0.73	**	0.56	*
Second birth	1.14		1.18	
Third birth	1.40	**	1.36	

Note: Standardized for level of education, time period, region (East/West Germany), educational participation, not in labor force.
Annual: Model includes annual activity status (lagged by one year).
Monthly: Model includes monthly activity status (date of childbirth backdated by nine months)
*** p<0.01; ** p<0.05; * p<0.10.

Table A8: Sensitivity analysis of the relative risks of first, second, and third births among the unemployed (versus the employed) by duration of unemployment*), women and men in Denmark

Men	**First birth Ages 20-28**	**First birth Ages 29-43**	**Second birth**	**Third birth**
none	1	1	1	1
0-20%	1.17	0.98	0.96	1.03
20-40%	1.07	0.81	0.86	1.12
40-60%	0.97	0.70	0.79	1.12
60-80%	0.91	0.64	0.73	1.16
80-100%	0.75	0.50	0.67	1.15
Women	**First birth Ages 20-28**	**First birth Ages 29-43**	**Second birth**	**Third birth**
none	1	1	1	1
0-20%	1.32	0.98	0.98	1.06
20-40%	1.35	0.95	0.99	1.12
40-60%	1.38	0.96	1.01	1.13
60-80%	1.33	0.90	0.97	1.15
80-100%	1.35	0.85	1.02	1.22

Note: *) Duration of unemployment represents fraction of calendar year. Standardized for student status, educational attainment, age group, and calendar year.
Source: Danish Population Registers 1981-2001, authors' own calculations.