

**The educational gradient of nonmarital childbearing in Europe: convergence  
towards a pattern of disadvantage**

Brienna Perelli-Harris<sup>1</sup>, Wendy Sigle-Rushton<sup>2</sup>, Trude Lappegard<sup>3</sup>, Renske Keizer<sup>4</sup>,  
Michaela Kreyenfeld<sup>1</sup>

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1 Max Planck Institute for Demographic Research: perelli@demogr.mpg.de

2 London School of Economics

3 Statistics Norway

4 Netherlands Interdisciplinary Demographic Institute

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The increase in nonmarital childbearing is one of the most striking demographic changes to have occurred in Europe throughout the past several decades. Nearly every European country has experienced at least some increase in nonmarital childbearing (Council of Europe 2005), and the vast majority of the increase has been due to births within cohabitation, not to single mothers (Perelli-Harris et al 2009; Kiernan 2004). This increase has led demographers to conclude that the rise of childbearing within cohabitation is one of the defining elements of family change (McLanahan 2004; Sobotka and Touleman 2008; van de Kaa 2001; Lesthaeghe and Neidert 2006; Bumpass 1990; Thornton, Axinn, Xie 2007). In fact, this behavior has been described as one of the principal components of the Second Demographic Transition, along with increases in cohabitation in general and the postponement of marriage and parenthood (Lesthaeghe and Neidert 2006; Sobotka 2008). Given the stark increase in nonmarital childbearing and its prominent role in the Second Demographic Transition, however, relatively little is known about the correlates of nonmarital childbearing in Europe (although more work has been done in the UK, see e.g. Steele et al 2006; Hobcraft and Kiernan 2001). Some information is known about basic trends in nonmarital childbearing (Perelli-Harris et al 2009, Kiernan 2004, Konietzka and Kreyenfeld 2002; Kennedy 2005), but few studies have examined the educational gradient of nonmarital childbearing at the time of the birth, or whether this gradient has remained constant over time.

Understanding the educational gradient of nonmarital childbearing and how it changes over time is fundamental to understanding how family behaviors diffuse throughout different strata of society. We conceptualize the educational gradient not as the product of the causal effect of education on nonmarital childbearing, but instead as a reflection of the social stratification that defines basic groups. Education can be

seen as a proxy for the opportunities and resources available to women and subsequently passed down to their children (McLanahan 2004; Raymo 2003). People with different levels of educational attainment may have different reasons for choosing new family behaviors, reasons which reflect their attitudes, opportunities, or constraints. As new behaviors develop, the educational gradient may in fact change, as the reasons for that behavior change. Thus, the educational gradient associated with an emerging behavior could flatten and even reverse over time.

Focusing on the intersection between childbearing and union status also provides important insights about the diffusion of new forms of family behavior. As cohabitation has increased, its role has shifted through multiple forms, such as “precursor/prelude to marriage” or “trial marriage” (Casper and Bianchi 2002, Villeneuve-Gokalp 1991), “temporary union” (Villeneuve-Gokalp 1991) or “alternative to single” (Rindfuss and VandenHeuvel 1990, Manning 1993) and “indistinguishable from marriage” (Kiernan 2001) or “alternative to marriage” (Heuveline and Timberlake 2004). Several types of cohabitation may exist simultaneously within a society (Villeneuve-Gokalp 1991), and it may be difficult to distinguish between these types of unions or their relative prevalence. Pregnancy and childbirth within cohabitation, however, often signifies a critical juncture in the cohabiting relationship (Perelli-Harris et al 2009) and may prompt marriage. Thus, examining the educational gradient of childbearing within cohabitation provides insights into the meaning of cohabitation at a specific point in the lifecourse as well as its role in childbearing and rearing.

In this study, we build upon a previous paper that analyzes basic trends in nonmarital childbearing (Perelli-Harris et al 2009) to compare the educational gradient of childbearing in cohabitation in six European countries. The countries

represent major regions of Europe that have experienced increases in childbearing within cohabitation. Our study capitalizes on the rich reproductive and union histories of the British Household Panel Survey in the U.K., the Fertility and Family Survey in the Netherlands, and the Generations and Gender Surveys (GGS) in Norway, France, Germany, and Russia. Although each survey employed slightly different sampling designs and techniques, the primary variables studied here – union status, fertility, and education – are relatively comparable.

Retrospective fertility and union histories allow us to compare the development of nonmarital childbearing – and changes in the educational gradient of nonmarital childbearing - across time. Using models that control for the age and period distribution of fertility by union status, we address the following questions: 1) is there a significant educational gradient for childbearing within cohabitation and how does that gradient compare to the one for marital fertility? 2) what is the educational level of women who first began practicing these new behaviors 3) when and how did the educational gradient in nonmarital childbearing change over time? and 4) is the pattern of diffusion and change the same in all countries observed? The answers to these questions will help shed light on how childbearing within cohabitation emerged in each country, and whether it emerged for the same underlying reasons.

## **THEORETICAL FRAMEWORK**

### **Historical trends in nonmarital childbearing.**

Some low level of nonmarital childbearing has remained in all societies since the expansion of marriage. Church and other historical records show that during the 16th to 19th centuries, the “illegitimacy ratio,” or the percent of births born out of

marriage, ranged from about 2% to 6% in most countries of Europe (Laslett et al 1980). In the Nordic countries, nonmarital cohabitation was particularly high in the mid-1800s; one study estimated that in Norway around 1855, the number of children born or conceived out of wedlock was as high as 44% (Trost 1978), but this was generally an exception. Overall, nonmarital childbearing primarily occurred among the most disadvantaged groups of a society, for example rural inhabitants, previously married, or the poor (Kiernan 2004). In Sweden cohabiting couples of this type were sufficiently prevalent to be called “Stockholm marriages,” which referred to cohabiting couples who moved from rural to urban areas, but could not afford to marry (Trost 1978). In Germany, such poor cohabiting couples were called “Onkelehen” after World War II (Ostner 2001). In addition, some countries imposed barriers to marriage that prevented certain couples from marrying. In historical Germany, for example, landless men were not allowed to marry, and until the end of the 18<sup>th</sup> century, only German citizens were allowed to marry (Mitterauer 1983). Thus, in most countries nonmarital childbearing was considered a form of sexual nonconformism and outside the norms or privileges of reputable society (Laslett et al 1980).

In some countries, however, cohabitation and childbearing within cohabitation may have developed as a rejection of the traditional institution of marriage. Sometimes the explicit rejection of marriage was practiced by the highly-educated. In Sweden in the early 1900s, an intellectual elite rejected religious marriage, insisting instead on civil marriages, or “Marriages of conscience” (Trost 1978). By the 1960s and 1970s in the Low Countries of Belgium and the Netherlands, new living arrangements such as cohabitation were observed to be practiced by better educated younger cohorts with an “egalitarian world view” (Lesthaeghe and Surkyn 2002).

Indeed, Lesthaghe and van de Kaa (1987) argued that the better educated men and women, who placed greater emphasis on Maslow's (1954) "higher order needs" were the forerunners of the Second Demographic Transition. Thus, the increase in childbearing within cohabitation appears to have started and spread with one of two distinct social patterns: either the lack of human and financial resources associated with disadvantage, or the rejection of traditional institutions associated with independence and/or opportunities and resources.

### **Education**

Education has long been used as an indicator of underlying concepts, such as potential earnings prospects (Sweeney 2002, Raymo 2003), or access to resources more broadly defined (McLanahan 2004). In our study, low education is used as a proxy for disadvantage, while higher education is used as a proxy for increased economic independence and/or ideational shifts in values. In the following section, we draw on theories from the marriage and nonmarital childbearing literature to explain the potential relationship between education and childbearing within cohabitation.

#### *Lower education*

The association between low levels of education and nonmarital childbearing has been well documented in the United States (Rindfuss, Morgan, and Offutt 1996; Upchurch et al 2002; Ventura et al 1995), Great Britain (Hobcraft and Kiernan 2001) and recently in Russia (Perelli-Harris and Gerber forthcoming). Numerous studies have investigated the causes and consequences of this association, especially in the U.S. (Wu and Wolfe 2001) but also in Great Britain (Kiernan 2002). The findings show that along with having lower education, single and cohabiting unmarried mothers in these English-speaking countries are disproportionately disadvantaged. For example, mothers in the U.S. who have had a birth out-of-wedlock have higher rates

of poverty and welfare dependency (Lichter et al. 2003). Whether the nonmarital birth leads to the disruption of education and hence worse outcomes or whether women predisposed to worse outcomes are selected into having a nonmarital birth is a matter of debate (Upchurch and McCarthy 1990, Ribar 1999). But in any case, there is a clear association. Following Perelli-Harris and Gerber (forthcoming), we call this general association the “Pattern of Disadvantage.” The “Pattern of Disadvantage” is not meant to ascribe causality, or argue that this relationship leads to certain consequences, but is instead meant to describe a pattern of behaviors.

Several related mechanisms could be producing the association between disadvantage and nonmarital childbearing. As Edin and Kefalas (2005) show in their extensive qualitative study, poor women often choose to have a child as a way to find meaning in their lives and, at the same time, they see their romantic partners as economically or socially unsuitable for marriage (see also Anderson 1990). Cohabiting couples may lack the necessary resources to turn their relationship into a marriage, either because of inadequate funds to buy a house or hold a wedding, or insufficient emotional or financial resources to commit to a long-term relationship (Edin and Kefalas 2005; Gibson-Davis et al 2005). These arguments tie in with Oppenheimer’s explanations for the overall reduction in marriage: as male employment uncertainty increases, marriage is delayed or forgone in favor of cohabitation (Oppenheimer, Kalmijn, and Lin 1997, Oppenheimer 2003).

On the opposite side of the educational spectrum, higher education in the U.S. is associated with higher levels of marriage (Goldstein and Kenney 2001). Educational attainment increases earnings potential and the possibilities for steady employment, which enhances the attractiveness of women on the marriage market (Sweeney 2002). The steady income and employment associated with higher

education also allows couples to meet the “economic bar” for marriage, or to achieve other milestones perceived to be important for marriage, for example buying a house. Thus, marriage in the U.S., and perhaps elsewhere, appears to have become a marker of prestige and achievement, in fact a status symbol (Cherlin 2004).

### *Higher education*

Childbearing that occurs within cohabitation could be associated with higher education for two reasons: 1) higher education provides greater access to resources that lead to economic independence or 2) higher education leads to ideational shifts in values associated with autonomy and individualism. Becker’s “specialization and trading” model of marriage predicts that women with who have a good position in the labor market will reduce marriage; thus, their increasing economic independence will lead them to avoid marriage in favor of cohabitation which is a less binding relationship (Becker 1991). Although this theory has not been validated with empirical evidence in the U.S. (Goldstein and Kenney 2001), it could be relevant in other contexts, especially those with greater gender equity or stricter divorce regulations.

In addition to providing greater economic resources, education has long been considered a mechanism for the ideational shifts leading to family change (Caldwell 1982, Cleland and Wilson 1987). As discussed above, these value shifts are crucial to the idea the “Second Demographic Transition” (SDT) (Lesthaeghe and Neidert 2006; Lesthaeghe and Van de Kaa 1986). The SDT is associated with an increase in individual autonomy, rejection of authority, and the emergence of values connected to Maslow’s “higher order needs” of self-actualization (Lesthaeghe and Surkyn 2004). Lesthaeghe and associates (2002, 2006) draw connections to Ron Inglehart’s theory of post-materialism, which posits that values change as material needs are met, not only



through economic development, but also through investments in education. Indeed, higher education is strongly correlated with the values associated with post-materialism and the SDT; research from the World Values Survey shows that individuals with higher education are more committed to individualism and gender equality and less supportive of authority (Sarbrough 1988; Weakliem 2002). Higher education may also be associated with secularism and a rejection of the authority of the Church. Laplante (2006) argues that Catholics in Quebec abandoned traditional Christian norms when the Church refused to change its doctrine about marriage and sexuality, thus leading to a striking increase in cohabitation. This explanation may be valid in other “post-Catholic” countries such as France, which have also had anti-Catholic movements (Goldstein and Kenney 2007).

### **Diffusion of nonmarital childbearing throughout society**

We expect that the pattern of childbearing within cohabitation has not developed uniformly across countries. In some European countries, childbearing within cohabitation will have started among the least educated, failed to diffuse to other educational groups, and remains indicative of disadvantage and inequality as in the United States. In other countries, childbearing within cohabitation will have diffused from the least educated throughout the population so that little educational gradient remains. In others, the trend could have started among the most highly educated with or without subsequent diffusion downwards. Taken as a whole, we anticipate that this study will provide evidence of multiple pathways to family change in Europe, but that overall, nonmarital childbearing will be indicative of a divergence in family formation strategies between the highest and least educated strata of the population.

## **ANALYTIC STRATEGY**

### *Data*

We use a number of surveys to study the educational gradient of nonmarital childbearing. The data from Russia, Norway, Germany, and France come from the Generations and Gender Surveys, which interviewed nationally representative samples of the resident population in each country. The GGS is a set of comparative surveys that are each representative of their respective populations. The questionnaire in each country is intended to follow a standard format, but several countries had to incorporate it into existing surveys and included context-specific questions. The Dutch data come from the 2003 Fertility and Family Survey and interviewed women aged 18-62. The data for the U.K. is from the British Household Panel Survey and required a slightly different dataset construction (see website).

Although each survey employs different survey and sampling designs, we followed standardized procedures to create cleaned harmonized union and reproductive histories (Perelli-Harris, Kreyenfeld, and Kubisch 2009). The events studied here are relatively comparable – births, union formation, and education. Cohabitation could have different meanings in different settings, but the questions generally relate to co-resident relationships with an intimate partner. In some of the GGS surveys (and the BHPS), the question specifically refers to cohabiting relationships that last more than three months. The unique design of the BHPS required us to restrict the sample to women who were interviewed in wave 15, participated in all waves of the survey for which they were eligible for interview and provided information on the start date of their first partnership. Of course, these data are retrospective, and thus subject to recall error, which may be particularly problematic for cohabiting relationships. This limitation is of particular concern with

the German data, which appears to underreport cohabiting and marital unions (Kreyenfeld and Kubisch 2009).

### *Methods*

In this paper we are interested in examining the educational gradient for childbearing to single mothers and cohabitators and whether the educational gradient changes over time. Because a greater percent of first births are nonmarital compared to higher parity births (Perelli-Harris et al 2009), an analysis of first births provides the clearest depiction of the educational gradient of nonmarital childbearing. Also, including higher order births in our analysis would risk conflating trends in parity and spacing with trends in nonmarital childbearing.

Simply presenting percents of first births by union status and education does not account for factors such as changes in the age composition of the population or period effects. Thus, we focus on rates of childbearing by union status. Following the approach taken in Perelli-Harris and Gerber (2009), we estimate the monthly rates of single, cohabiting, and marital births, defined simply as the number of first births of each type occurring during a given month divided by the number of women at risk of any first birth at the start of that month. Thus, the rate of single first births in a particular month is the number of single first births during that month divided by the number of childless women of childbearing age at the start of the month.

The three birth rates of interest are equivalent to three competing risks, which we model in a discrete-time framework by estimating multinomial logistic regressions (MLR) using the sample of all person-months when childbearing-age respondents were at risk for having a first birth. The basic form of the model is:

$$h(m)_{it} = p(y_{it} = m) = \frac{\exp(\sum x_{ijt} \beta_{jmt})}{\sum_{m=1}^M \exp(\sum x_{ijt} \beta_{jmt})}, \quad (1)$$

where  $h(m)_{it}$  denotes the hazard that respondent  $i$  will experience event  $m$  in month  $t$ , which is equivalent to the probability that  $i$  has the value  $m$  on a nominal variable  $y$  at the end of month  $t$ . There are four categories of  $y$ : a single birth, cohabiting birth, marital birth, and no birth in month  $t$ . The  $x_{ijt}$  represent respondent  $i$ 's values on a set of  $j$  potentially time-varying covariates at time  $t$ . The  $\beta_{jm}$  are parameters estimated from the data using maximum likelihood. The  $m$  subscript on  $\beta_{jm}$  shows that a separate parameter vector is estimated for each possible type of event. The model is identified by constraining all the elements in one such vector to equal zero (e.g.  $\beta_{j1} = 0$ ). The models include women aged 15-44 in each period.

### *Measures*

**Education.** The education system differs greatly across countries, but we have attempted to standardize the analyses by using the International Standardized Classification of Education (ISCED 1997) to classify country-specific data into six educational categories<sup>1</sup>. We then collapse these six categories into three basic categories: low (ISCED 1 and 2), medium (ISCED 3 & 4), and high (ISCED 5 & 6). The lowest education level refers to less than completed basic secondary, medium refers to completed secondary school and any education beyond secondary education but less than completed college (including vocational and technical schools), and higher education refers to a bachelor's or university degree and higher.

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<sup>1</sup> Our UK classification deviates somewhat from the suggested ISCED system, because we include people who received very poor scores on their O-level/GSCE tests in ISCED category 2,

We construct time-varying covariates for school enrollment and educational attainment based on data available in the survey, registry data, or external sources. Norway has the most accurate time-varying covariates, because the GGS survey can be linked to retrospective educational histories in civil registers. For the Russian and German data, we impute continuous schooling from age 15 to date of graduation from highest level of education achieved. We also use information on whether the respondent was enrolled at the time of interview to impute continuous schooling up to age 23. After that age we are reluctant to impute continuous enrollment, since respondents could have taken a break from education. In the Netherlands and the UK, we use external sources to impute continuous education to the average age of graduation from each level of educational attainment achieved. The Dutch data uses averages from census data, while in the UK educational enrolment is imputed using information on highest qualification combined with a schedule of educational progression that is outlined in the national curriculum of England and Wales (<http://www.britishschool.org/Admissions/GroupEntry>). In addition, for the Netherlands and the UK we also use information on school enrollment at the time of interview to impute continuous schooling up to age 23.

**Period.** We standardized on models with 5-year periods. We also tested 10-year periods, but found that 5-year periods provided a more accurate fit. Note that due to data discrepancies (Kreyenfeld and Kubisch 2009), the German data is only reliable after the 1980s.

**Age.** Age refers to current age in a particular month. We include age and age-squared to capture non-linearities in aging effects

## RESULTS

### *Descriptive Statistics*

As consistently documented in other studies (Kiernan 2004, Perelli-Harris et al 2009, Council of Europe 2005), childbearing within cohabitation has steadily increased in all the countries of our study (Table 1). The increase was most pronounced in France and Norway; only 9-12% of first births occurred within cohabitation in the 1970s, but by the early 2000s over half of all first births occurred within cohabitation. The increase in the UK and the Netherlands did not take off until the 1990s, but by the early 2000s, over a quarter of first births occurred within cohabitation. In Russia, nearly 10% percent of first births occurred within cohabitation in the 1980s and 1990s, increasing to 18% in the early 2000s. Only in West Germany does childbearing within cohabitation appear to have remained marginal (under 15%), but the much higher percent of single births leads us to question whether cohabiting unions were underreported in the German GGS. Thus, the distribution of births by union status for Germany must be interpreted with caution (Kreyenfeld and Kubisch 2009).

(Table 1 about here)

Table 1 also shows the change in the distribution of first births by union status for each educational level. Although we would have expected distinct patterns to emerge over time, the results are strikingly similar. By and large, every country appears to have a strong positive educational gradient for marital births and a strong negative educational gradient for single births. The only exceptions are for the marital gradient: in the Netherlands in the 1970s and 1980s, in France in the 1980s, and in Russia in the 1990s the percent of marital births for those with medium education was slightly higher than for those with higher education. Thus, our data suggest a negative educational gradient for nonmarital births in all countries.

The educational gradient for cohabiting births alone, however, does appear to be more complicated. There is a strong and persistent negative educational gradient in

Norway, Russia, and West Germany. In the other countries, the pattern is less consistent. In the UK, the educational gradient is not as pronounced in the 1980s and 1990s, when the percent of births within cohabitation was highest for those with medium education, but the educational gradient does become strongly negative in the 2000s. In the Netherlands, a slightly positive educational gradient exists in the 1970s and 80s, but it reverses in the later periods, when the percent of cohabitating births increases rapidly, suggesting that the highly educated could have been the forerunners of childbearing within cohabitation, with the least educated overtaking in the 1990s when the phenomenon became more widespread. A similar type of pattern may have developed in France. The educational gradient is slightly positive in the 1970s, but becomes mixed in the 1980s. It becomes negative in the 1990s, but less distinct in 2000-04 when those with medium education have the highest percent of births to cohabiting parents. Already, table 1 suggests multiple paths for the initiation of childbearing within cohabitation, but a nearly universal convergence to a negative educational gradient after 1990.

#### *Competing Risk Hazard Models*

As discussed in Perelli-Harris and Gerber (forthcoming), estimating rates of single, cohabiting, and marital births provides more information than simple percents, because rates can vary independently, while percents are dependent on the changes that may occur to the other types of births. In other words, the percent of cohabiting births may increase due to declining marital fertility, not due to an increase of women giving birth within cohabitation. Most importantly, competing risk hazard models allow us to investigate whether childbearing within cohabitation is significantly associated with education for each union status, while controlling for the age structure of fertility, changes in single or marital fertility, and the influence of school

enrollment. Table 2 shows the relative risk ratios for covariates associated with having a first birth by union status, with “not having a birth in a given month” as the reference category. Our focus is on the rows showing the relative risk of education. For each union type, a relative risk above one implies a higher birth rate relative to the reference category than women with medium education, and a risk below one implies a lower birth rate relative to the reference category than women with medium education.

First note that there is a strong negative educational gradient for first birth risks to single women in each country studied. First birth risks for single women with the lowest education are significantly higher than first birth risks for women with medium education, with the exception of Russia, where the coefficient is still in the right direction. The differences between women with medium and high education are only significant in Norway, Russia, and the UK, but they are in the same direction in the other countries. This result, however, is not surprising, given that births to single mothers among the least educated is a well-established finding.

What is more surprising is the consistently strong negative educational gradient for first births to cohabiting women. In every country, the first birth risks for either low or high education are significantly different from those for medium education, and in Norway both are significantly different. In the UK, the relative risk for low education is lower than medium education, but the difference is not significant, implying that the gradient can only be defined between women with secondary and college education. France and Russia are similar in that women with low and medium education do not differ, but there is stronger evidence that women with higher education have lower first birth risks within cohabitation. On the other hand, in West Germany and the Netherlands, the main difference is between women



with low and medium education; there is no significant difference between medium and high education.

Contrary to the consistent results for nonmarital births, the associations with education for marital births are completely mixed. France and West Germany show no significant differences by education, the Netherlands and the UK show a positive educational gradient, Norway has a negative educational gradient, and Russia has a U-shaped gradient. These results suggest that the educational gradient for marriage is less stable across countries, reflecting variation in the postponement of first births due to a complicated array of country-specific factors, for example youth unemployment, economic uncertainty or prolonged education (Kohler, Billari, and Ortega 2002). We do not attempt to explain this variation here, as the relationship between education and postponement of first births within marriage has been studied elsewhere (see for example, Rendall et al 2009) and is beyond the scope of this paper.

As expected, the period coefficients show that all countries experienced an increase in birth risks within cohabitation, although some of the coefficients in later periods were no longer significant, indicating that the rapid increase in childbearing within cohabitation stalled. Changes over time for single birth risks were less consistent, reflecting behaviors that differ by country. Relative risk ratios for marital births generally decreased, as the age at first birth was postponed and childlessness increased, although the magnitude of the risk differs by country. In addition, West Germany and to some degree the Netherlands, showed no significant decline in marital fertility over time. All countries showed that school enrollment lowered birth risks to cohabitating and single women by about two-thirds, and to marital women between 50-80%. Age effects were also relatively similar across countries, reflecting

the general age pattern of fertility that rises and then falls throughout the reproductive years.

Although the results presented in table 2 show the association between education and birth risks by union status, they do not show the relationship relative to the other union statuses. In order to better understand the association between education and cohabiting birth relative to the same association for marital birth risks, we present figure 1. Figure 1 shows different models that employ the competing risk hazards; now the reference category is marital births rather than no births. This allows us to see whether the educational gradient for childbearing differs between cohabiting and married women.

Consistent with our previous results, figure 1 shows a negative educational gradient for all countries. The magnitude and significance of the educational gradient, however, differs across countries. The strongest educational gradients are in Norway, the UK, and Russia, where cohabiting women with lower and higher education have significantly different birth RRRs than women with medium education, relative to married women. For example, in Russia, cohabiting women with lower education have RRRs that are 89% higher than cohabiting women with medium education, relative to the same ratio for married women. Cohabiting Russian women with the highest education have RRRs that are 27% lower than women with medium education, relative to the same ratio for married women. Similar to the results in table one, the coefficients for West Germany and the Netherlands show that lower education is significantly different than medium education, but higher education is not. In fact, the Netherlands is the only country without a neat progression downwards; women with higher education have slightly higher RRRs than women with medium education, although the difference is not significant. Finally, France also

has a negative educational gradient, but the coefficients are not significant, indicating that the differences between cohabiting and marital birth RRRs are weak at best.

These results suggest that by and large, childbearing within cohabitation not only differs from marital childbearing, it is consistently indicative of a “pattern of disadvantage.” Although this pattern may be weaker in some countries than in others, it does appear to be a general phenomenon. Of course, the comparisons between educational levels across countries could be inaccurate; for example, the ISCED classifications may not accurately represent the value of a vocational degree versus a college degree in a particular society rendering the comparison between higher education levels across countries unsound. However, because we are interested in comparing educational gradients rather than the meaning of education in a particular society, this limitation is less important. In addition, if we were to move people from one category to another, the most that could happen would be to negate a significant effect, creating a flatter educational gradient; it would be impossible to reverse the educational gradient.

*Has the educational gradient changed over time?*

As discussed above, one of the primary goals of this paper is to investigate the initiation of childbearing within cohabitation and to examine whether the educational gradient changes over time. To do this, we included interaction terms between educational level and period in each model. In most countries, the interaction terms for cohabitation were insignificant, or did not show a consistent pattern (for example, in the Netherlands there were a few significant results, but due to low sample size the models were not robust).

(Figure 2 about here)

In France, however, an interesting pattern emerges when interaction terms are included. When “no birth” is the reference category, the pattern is very similar to table 1: women with lower education have higher first birth risks within cohabitation in most of the periods, and the interaction terms show no significant reversal. When marital births are the reference category, however, the relationship between higher education and first birth risks within cohabitation reverses. Figure 2 shows that in the early 1970s, when only about 12% of births were to cohabiting women, the RRRs did not differ by educational level. In the late 1970s and early 1980s, when childbearing started to increase, women with higher education had RRRs significantly higher than women with medium education, relative to married women (significant at the 0.05 level), although it appears that the difference in RRRs for women with high and low education may not be significant. Then, childbearing within cohabitation started to rapidly increase for women with low and medium education, while it decelerated for women with higher education. By 1990, women with higher education had the lowest RRRs within cohabitation compared to married women, and by 2000-04 this result was again highly significant. Thus, France is a very interesting case in which the forerunners of childbearing within cohabitation may have been the most highly educated, as predicted by the Second Demographic Transition, but by the 1990s the pattern of disadvantage had become the predominant pattern.

(Figure 2 about here)

## DISCUSSION

Because cohabitation and childbearing within cohabitation have become so prevalent in Europe, especially in Scandinavia and France, researchers often assume that cohabitation in Europe is essentially the same as marriage (Raley 2001). As a result, far less research has been conducted on nonmarital childbearing, and European

researchers tend to combine cohabitation with marriage, emphasizing the existence of the union, whether legalized or not (e.g. Henz and Thomson 2005; Aasve et al 2004). In many of the theoretical discourses on family change in Europe, cohabitation and childbearing within cohabitation are usually seen as a natural outcome of the rise of individualism, secularism, the rejection of institutions, and post-materialist values, values associated with higher education and higher incomes – in short, the Second Demographic Transition (van de Kaa 2001, Lesthaeghe and Neidert 2006, Hoem and Kostova 2008; Hoem et al 2009; Zakharov 2008). This viewpoint is in direct contrast to that in the United States, where numerous studies have confirmed a link between nonmarital childbearing and disadvantage (Wu and Wolfe 2001).

Our results provide evidence that across Europe nonmarital childbearing – both to single and cohabiting mothers – has more in common with the pattern of disadvantage than the second demographic transition. Although there is greater variation in the level of the percent of births born to single mothers and cohabitation in Europe than in the U.S., all of our analyses demonstrated at least some association between childbearing within cohabitation and lower education. Even when compared with the educational gradient of first births within marriage, the negative educational gradient of first birth risks within cohabitation was strong, although the strength and significance of the relationship differed across countries and across time. One of the most significant educational gradients was in Norway – one of the Scandinavian countries often held up to be a model second demographic transition country (Raley 2001). This result leads us to question whether the theoretical explanations of the second demographic transition are applicable with respect to childbearing within cohabitation.

Our results did show some variation over time, indicating that there are multiple pathways to the development of childbearing within cohabitation. In most countries, the negative educational gradient has been entrenched since its historical beginnings. In Norway, for example, the innovators in childbearing within cohabitation were among the least educated and continued to dominate during its rapid growth. In others, such as Russia and West Germany, childbearing within cohabitation remained at a low to medium level for a longer period, and only recently experienced substantial increases, but nevertheless the educational gradient did not change. In France, on the other hand, the most highly educated appeared to initiate increases in the late 1970s and early 80s, or rather those with medium education had the lowest birth risks within cohabitation. Then, when the increase in childbearing within cohabitation accelerated in the mid 80s, the educational gradient reversed again to become predominantly negative, as in the other countries. Such a reversal may also have occurred in the Netherlands, since the descriptive statistics appear to show a slight positive educational gradient for percent of births in cohabitation. Unfortunately, our small sample size inhibits our ability to fully test changes over time using the full models. Nonetheless, the Netherlands showed higher birth risks among the least educated for cohabiting women.

While our study only focuses on a limited number of countries in Europe, the countries studied represent the major regions of Europe – with the exception of Southern Europe, where nonmarital childbearing is still marginal (Perelli-Harris et al 2009). Other countries may, of course, exhibit a different educational gradient with a different pattern over time. Yet we find that this is unlikely. For example, one hypothesis suggests that cohabitation in “post-Catholic” countries emerges among the most educated, who are more likely to reject the Church (LaPlante 2006, Goldstein

and Kenney 2007). However in a study of Poland, the most Catholic of European countries, cohabitation appears to be emerging most quickly among the least educated (Matsyiak 2009), suggesting that childbearing within cohabitation in Poland is related to the pattern of disadvantage. Thus, we feel that the pattern of disadvantage generally describes the pattern of childbearing within cohabitation across Europe.

Our results show that focusing on the intersection of childbearing and cohabitation is crucial to understanding the diffusion of new family behaviors. It may be that premarital, pre-childbearing, “trial unions” or childless long-term cohabiting unions are practiced by a larger cross-section of society, or even by the most educated. Indeed, cohabitation may be an important means for individuals to fulfill their needs for intimacy, while postponing events such as marriage and childbearing, events which require greater commitment and emotional and economic stability. But, given that marriage is still a respected institution that signifies status and stability (Cherlin 2004), the childbearing process or intentions to have children may cement a relationship and encourage the most advantaged to get married. Thus, by the time of birth, important patterns of social stratification are revealed. The decision to bear and raise children produces different union trajectories among the least and most educated, leading to stratification within society.

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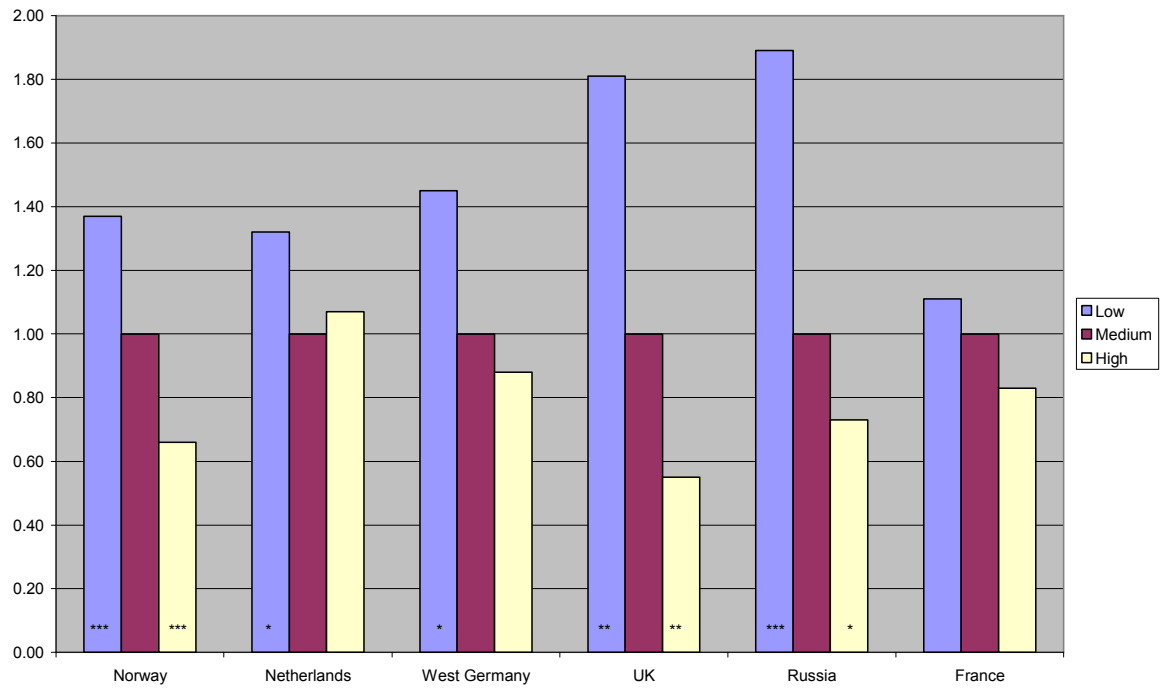
**Table 1. Percentages of women who had a first birth, by union status, educational level and period.**

Country	Low		Medium		High		Total	
	Single	Married	Single	Married	Single	Married	Single	Married
<b>France</b>								
1970-79	13	76	10	79	7	80	11	78
1980-89	12	58	7	72	8	66	9	66
1990-99	16	36	7	48	4	63	8	51
2000-04	18	32	7	33	0	54	5	43
<b>Ger (West)</b>								
1980-89	27	64	13	82	14	81	16	78
1990-99	27	61	11	78	12	81	15	75
2000-04	23	57	7	79	4	86	10	76
<b>Netherlands</b>								
1970-79	3	94	1	96	0	91	2	95
1980-89	6	89	3	93	2	91	4	91
1990-99	11	69	4	80	3	82	6	77
2000-03	10	55	3	67	0	71	3	70
<b>Norway</b>								
1970-79	27	59	8	84	5	88	13	78
1980-89	18	48	10	59	4	94	12	63
1990-99	17	28	9	37	6	56	9	42
2000-04	12	25	5	32	3	50	5	41
<b>Russia</b>								
1970-79	16	71	10	82	9	82	11	80
1980-89	19	64	11	80	9	83	11	78
1990-99	17	62	12	74	16	71	13	71
2000-04	28	44	19	65	11	74	19	63
<b>UK</b>								
1970-79	10	87	5	93	3	97	6	93
1980-89	26	68	18	69	5	87	14	76
1990-99	45	38	18	47	12	76	18	60
2000-04	49	6	25	36	6	71	16	53

**Table 2. Relative Risk Ratios for Competing Risk Hazard Models of First Births by Union Status, Women 15-44, Reference category: No birth**

	France	Ger(West)	Neth.	Norway	Russia	UK
<b>Single</b>						
Low	1.56 ***	2.08 ***	2.46 ***	2.05 ***	1.26	2.27 ***
Medium	1.00	1	1.00	1	1.00	1.00
High	0.72	0.97	0.75	0.63 **	0.61 ***	0.48 ***
1970-74	3.12 ***		0.28 ***	0.59 *	0.65 ***	0.34 **
1975-79	2.37 ***		0.21 ***	0.70	0.46 ***	0.11 ***
1980-84	1.60	0.94	0.50	0.49 **	0.56 ***	0.44 **
1985-89	1.97 *	0.90	0.69	0.53 **	0.73 *	0.76
1990-94	1.83 *	1.25	0.99	0.64 **	0.80	0.77
1995-99	1.70	1.06	1.22	0.73	0.67 *	1.19
2000-04	1	1	1.00	1.00	1.00	1.00
In school	0.36 ***	0.25 ***	0.31 ***	0.27 ***	0.30 ***	0.36 ***
Age	1.65 ***	1.04 ***	1.40 **	1.15	1.85 ***	1.38
Age-squared	0.99 ***	1.00 ***	0.99 **	1.00	0.99 ***	0.99 *
N Sing births	441	296	107	400	787	363
<b>Cohabiting</b>						
Low	1.14	1.51 **	1.48 ***	1.33 ***	1.22	0.76
Medium	1.00	1	1.00	1.00	1.00	1.00
High	0.82 *	1.02	0.97	0.75 ***	0.60 ***	0.46 ***
1970-74	0.31 ***		0.08 ***	0.07 ***	0.58 ***	0.06 ***
1975-79	0.38 ***		0.07 ***	0.08 ***	0.44 ***	0.03 ***
1980-84	0.43 ***	0.24 ***	0.10 ***	0.13 ***	0.51 ***	0.14 ***
1985-89	0.62 ***	0.40 ***	0.13 ***	0.24 ***	0.76	0.33 ***
1990-94	0.86	0.68 **	0.29 ***	0.35 ***	0.97	0.46 ***
1995-99	0.94	0.84	0.61 ***	0.49 ***	0.87	0.87
2000-04	1.00	1	1.00	1.00	1.00	1.00
In school	0.29 ***	0.31 ***	0.34 ***	0.27 ***	0.30 ***	0.22 ***
Age	2.27 ***	1.05 ***	2.14 ***	1.56 ***	1.69 ***	1.16
Age-squared	0.98 ***	1.00 ***	0.99 ***	0.99 ***	0.99 ***	1.00 *
N Coh births	872	234	299	1299	692	402
<b>Married</b>						
Low	1.03	1.04	1.13 **	1.01	0.65 ***	1.25 *
Medium	1.0	1	1.00	1.00	1.00	1.00
High	0.98	1.01	0.90	1.19 **	0.82 ***	0.87 *
1970-74	3.86 ***		1.05 ***	1.51 ***	1.30 ***	2.07 ***
1975-79	3.14 ***		1.02	1.31 ***	1.28 ***	1.79 ***
1980-84	2.22 ***	0.87	1.18	0.93	1.33 ***	1.45 **
1985-89	1.74 ***	0.95	1.12	0.72 ***	1.44 ***	1.23
1990-94	1.49 ***	0.90	1.00	0.63 ***	1.52 ***	0.91
1995-99	1.41 ***	0.95	0.91	0.57 ***	1.02	0.98
2000-04	1.00	1	1.00	1	1	1.00
In school	0.28 ***	0.21 ***	0.30 ***	0.27 ***	0.48 ***	0.40 ***
Age	3.45 ***	1.08 ***	3.43 ***	2.00 ***	2.66 ***	2.69 ***
Age-squared	0.98 ***	1.00 ***	0.98 ***	0.99 ***	0.98 ***	0.98 ***
N Mar births	2610	1194	2260	2228	4443	1949
N Person months	597153	344092	634892	443521	499183	533118

**Figure 1. Relative risk ratios for competing risk hazard models for the educational gradient of births to cohabiting women relative to married women, 1970-2004.**



**Figure 2. Relative risk ratios for competing risk hazard models for the educational gradient of births to cohabiting women relative to married women with interactions over time: France.**

