Educational Differences in Early Childbearing: A Cross-national Comparative Study

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Abstract: This cross-national comparative study seeks to evaluate the generality of socioeconomic differences in early childbearing observed in the U.S. and to shed light on the ways in which differences in early childbearing are shaped by context. In the preliminary analyses presented here, we estimate educational differences in the risk of having a child before age 23 and the extent to which those differences have changed across cohorts in seven countries (France, Germany, Hungary, Japan, the Netherlands, Russia, and the U.S.). We find that a negative educational gradient in early childbearing is common across countries whereas increasing concentration of early childbearing among women with less education is observed in some countries, but not others. In subsequent extensions, we will use alternative measures of early childbearing, consider alternative indicators of women's socioeconomic status, increase the number of countries, pool data across countries, and include direct measures of context to estimate multi-level models.

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A great deal of attention has been devoted to early childbearing in the U.S., especially teenage childbearing and its relationship with socioeconomic disadvantage. Not only is early childbearing more common among women with more limited socioeconomic resources (Amato et al. 2008; Geronimus and Korenman 1992), but there is also evidence that it contributes to adverse outcomes for mothers and their children (Hoffman and Scher 2008; Taniguchi 1999) as well as fathers (Brien and Willis 1997). The concentration of early childbearing among women with more limited education thus has important implications for the reproduction of disadvantage. Evidence that these differentials in the U.S. have widened in recent years (Martin 2004) is consistent with a more general bifurcation of family behaviors in which those with lower education are increasingly engaging in behaviors with potentially negative implications for women's and children's well-being, while those with higher levels of education are engaging in behaviors in with potentially positive implications for well-being (McLanahan 2004).

Explanations for educational differences in early childbearing emphasize a variety of economic, policy, and social factors. Among the most prominent is changing labor market opportunities for women that have increased the opportunity costs of early childbearing (as well as early marriage) for highly educated women to a greater degree than for those with less education (McLanahan and Percheski 2008). It is also possible that increases in the prevalence, and reductions in the stigma, of formerly non-normative family behaviors such as nonmarital childbearing have contributed to their increasing concentration among groups who feel that they cannot afford a more "desirable" family trajectory (Edin, Kefalas, and Reed 2004; Smock, Manning, and Porter 2005). Despite investments in developing these hypotheses and generating related empirical evidence, our understanding of growing educational differences in family behavior and their implications for well-being remains limited (Seltzer et al. 2005).

This limitation may reflect the difficulty of evaluating the relative importance of alternative explanations in studies based only on U.S. data, given that there is no variation (at the national level) in policy environment, economic context, normative environment, and other factors thought to contribute to observed patterns of change and variation. Existing research on the correlates of early childbearing in other industrialized countries is limited, especially outside of Western Europe (e.g., Rendall et al. 2009). In the absence of cross-national comparative evidence, it is not possible to evaluate whether patterns of

change observed in the U.S. are distinctive (Cherlin 2009) or characterize industrialized countries more generally (McLanahan 2004). A second, related, limitation is that studies of a single country or a small number of countries provide few insights into how relationships between educational attainment and early childbearing may depend upon economic, political, and social context.

Our goal in this paper is to document socioeconomic differences in early childbearing and their change over time in industrialized countries. To this end, we use comparable data from seven industrialized countries to describe differences by women's socioeconomic status in the risk of early childbearing. We define early childbearing in both absolute and relative terms—first, as births prior to age 23, and second, as birth age relative to country averages. In the preliminary results summarized here, we use event history models to describe the extent to which differences in childbearing before age 23 by educational category (low, middle, high) differ across countries and across two birth cohorts. Because educational attainment both affects and is affected by early childbearing, we will examine differences by other indicators of socioeconomic status (e.g., parental education and occupation) in subsequent extensions of these preliminary analyses.

Data and methods

In the preliminary results reported below, we use data for seven countries: France, Germany, Hungary, Japan, the Netherlands, Russia, and the U.S. Data for the U.S. comes from the 2002 National Survey of Family Growth (Cycle 6), data for Japan come from the 2002 and 2005 National Fertility Surveys, and data for the other five countries are from the first round of the UN Generations and Gender Surveys (GGS) conducted between 2003-2005. These surveys contain comparable information on age at first birth and educational attainment for similar cohorts of women.

Measures

Cohort: Because our interest is in relatively recent change, we limit our attention to women born between 1955-1979. In the preliminary analyses reported below, we use a two-category measure of birth cohort (1955-1964, 1965-1979).

Educational attainment: Cross-country differences in education systems are substantial, and we rely on existing efforts to generate comparable measures of educational attainment. In the GGS, comparable measures have been created according to the International Standardized Classification of Education (ISCED). Following Perelli-Harris et al. (2010), we collapse these measures into three categories: less than secondary school, completed secondary school and any additional education less than completed college (including vocational and technical schools), and university degree and higher. We use this basic classification scheme to construct measures for the U.S. and a slightly different measure for Japan which reflects the rather different distribution of educational attainment in that country. In subsequent revisions, we will also explore relative measures of educational attainment, such as lowest quartile, middle two quartiles, and highest quartile of years of education; this approach accounts for the increase over time in levels of education (McLanahan 2004) and mitigates the difficulties inherent in producing comparable classifications of highest degree across very different educational systems. We will also include an indicator of enrollment based on education history data (or information about standard ages of school completion when educational completion dates are missing), given that the incompatibility of balancing mother and student roles may be very important in some countries (Kraydal and Rindfuss 2008).

Age at first birth: We use retrospective family history data to calculate duration to first birth from initial exposure at age 15. Because we are interested in early births, we censor women who have not yet had a birth at age 23. The preliminary analyses presented here thus describe differences by educational attainment, cohort, and country in the risk of first birth through age 22. In subsequent analyses, we will consider other methods for assessing differences in the likelihood of early childbearing (e.g., the age by which x% of women in a given cohort give birth, quartiles of birth ages, or deviations from the country means); given large cohort and country differences in the prevalence of parenthood by age 23, using a fixed age threshold to define "early" births is likely not the best strategy. To facilitate the flexible specification of the baseline hazard, we use the retrospective fertility reports to construct person-year records for each respondent in the seven surveys. The dichotomous indicator of childbirth is coded as zero for all years prior to first childbirth. It is coded as one in the year of first childbirth, at which point women are censored. Those who do not have a child by age 22 are censored at their 23rd birthday.

Results

Table 1 describes the characteristics of women in each of the seven countries. We find notable differences in the prevalence of early (before age 23) childbearing, ranging from 5 and 9 percent of all births in Japan and the Netherlands, respectively, to fully 54 percent in Russia; France (21 percent), Germany (25 percent), the U.S. (37 percent), and Hungary (44 percent) fall somewhere in between. The birth cohort patterns are somewhat more similar, reflecting the broadly comparable sampling frames and timing of the surveys. Thirty-one to 47 percent of respondents across countries were born between 1955 and 64, and 53-69 percent between 1964 and 1979. There is substantial variation in the educational distributions across countries, although in all countries except Japan (which as noted, uses a different metric for categorizing education), the largest group is those with the middle level of education. The percent of respondents with low education ranges from 11 percent in Germany to 25 percent in the Netherlands (and 47 percent in Japan), and the percent with high education ranges from 11 percent in the Netherlands to 38 percent in France.

Table 2 presents results from our initial hazard models estimating the risk of an early birth, shown as log-odds ratios. Model 1 includes our measures of education and cohort, and Model 2 adds the interaction of education x cohort to evaluate whether educational differentials appear to be increasing over time. Results for Model 1 show that across all countries, those with low education are significantly more likely to have an early birth than those with high education, and those with middle education are also more likely to have an early birth than those with high education. These findings suggest that an educational gradient in first birth timing is common across these industrialized nations. With respect to cohort, we find that in some countries (France and Hungary) those in the later cohorts are less likely to have an early birth, in some countries (Russia and the U.S.), those in the later cohorts are more likely to have an early birth, and in some countries (Germany, Japan and the Netherlands), there is no change in early childbearing across cohorts.

Turning to the interaction of education and cohort (Model 2), we find modest evidence for increasing differentials by education over time in the likelihood of an early birth, but not in all countries. The

strongest results are for France, where low and middle education appears to be more predictive of an early birth (versus high education) in the later cohort than the early cohort. In Germany, those with low education are more likely to have an early birth in the later cohort, and in Russia, those with middle education are more likely to have an early birth in the later cohort. Nearly all of the other log-odds ratios are positive (suggesting an increasing educational gradient) but do not reach statistical significance. This may be because in some countries (e.g., Japan), the prevalence of early births, especially for the educational reference category, is very low or because we have defined 'early' births in this analysis at a relatively high age for some countries (Russia, Hungary and the U.S.). Our subsequent analyses using alternative definitions of early childbearing will be instructive for discerning the nature of the patterns over time.

Plans for further analysis:

In subsequent revisions of these preliminary analyses, we will: (a) Use predicted probabilities from the models like those presented in Table 2 to generate life-table representations of early childbearing classified by country, cohort, and educational attainment; (b) Pool data across countries in order to assess the statistical significance of cross-country differences; (c) Expand the number of countries in the study. We are currently working to prepare similar data from the U.K., Australia, Sweden, and several other industrialized countries; (d) Use this larger sample of countries and incorporate country-level characteristics to evaluate the ways in which context shapes the nature and magnitude of educational differences in early childbearing. These analyses will involve the estimation of multi-level discrete-time hazard models (Barber, Murphy, Axinn, and Maples 2000).

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Table 1: Sample characteristics

	France	Germany	Hungary	Japan[a]	Netherlands	Russia	U.S.
% Early birth (<age 23)	0.21	0.25	0.44	0.05	0.09	0.54	0.37
Cohort							
1955-64	0.41	0.45	0.38	0.38	0.42	0.47	0.31
1965-79	0.59	0.55	0.62	0.62	0.58	0.53	0.69
Education							
Low	0.21	0.11	0.17	0.47	0.25	0.13	0.20
Middle	0.41	0.63	0.60	0.37	0.65	0.58	0.52
High	0.38	0.26	0.23	0.16	0.11	0.29	0.28
N	2,601	2,673	3,376	19,173	2,504	2,735	5,754

Notes:

a: educational categories for Japan are high school or less, junior college & vocational school, university.

Table 2: Log-odds ratios from discrete-time models of first child birth prior to age 23

	France		**Germany**		**Hungary**		**Japan**[a]	
	M1	M2	M1	M2	M1	M2	M1	M2
Education (ref=University or more)								
Low: Less than HS	2.42**	1.92**	1.83**	1.27**	2.27**	2.12**	3.49**	3.14**
Middle: HS & above, no university	1.67**	1.33**	0.90**	0.80**	1.41**	1.44**	2.01**	1.67**
Cohort (ref= 1955-64)								
1965-79	-0.40**	-1.21**	-0.08	-0.45	-0.49**	-0.53**	0.02	-0.54
Education x Cohort								
Low x 1965-79		1.10**		0.99**		0.32		0.56
Middle x 1965-79		0.73*		0.26		-0.06		0.55
N	19,742	19,742	20,130	20,130	23,617	23,617	152,438	152,438

	Netherlands		**Russia**		**U.S.**	
	M1	M2	M1	M2	M1	M2
Education (ref=University or more)						
Low: Less than HS	3.61**	3.14**	1.09**	0.10**	2.72**	2.67**
Middle: HS & above, no university	1.93**	1.61	0.81**	0.65**	1.86**	1.67**
Cohort (ref=1955-64)						
1965-79	0.06	-0.65	0.20**	0.00	0.22**	0.05
Education x Cohort						
Low x 1965-79		0.83		0.14		0.07
Middle x 1965-79		0.54		0.28*		0.26
N	19,715	19,715	18,957	18,957	39,303	39,303

Notes:
All models include a continuous measure of age
* $p < .05$ ** $p < .01$
a: educational categories for Japan are high school or less, junior college & vocational school, university.