Educational Differences in Fertility Intentions: A U.S.-Japan Comparison

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ABSTRACT We examine educational differences in unintended childbearing in the United States and Japan using large, nationally-representative surveys. Focusing on these very different settings allows us to generate new insights regarding posited explanations for the concentration of unintended childbearing at the lower end of the educational spectrum in the U.S. Preliminary analyses indicate that differences in the level of unintended childbearing depend upon how we treat the large number of ambiguous responses in the Japanese survey. We find that the negative educational gradient is far more pronounced in the U.S. and that educational differences in birth intentions reflect the relatively high prevalence of conceptions at young ages and nonmarital conceptions among less-educated women in the U.S. We suggest that this is consistent with theoretical emphases on efficacy and on relationship uncertainty as explanations for the concentration of unintended childbearing at the lower end of the educational spectrum in the U.S.

One-half of all pregnancies in the United States are unintended (Finer and Henshaw 2006). Concern about the high prevalence of mistimed or unwanted pregnancies reflects evidence that they are associated with less favorable outcomes for both mothers and children. For example, reported birth intendedness is associated with family resources, parenting quality, and children's health (Barber, Axinn, and Thornton 1999; Barber and East 2009; Baydar 1995; Brown and Eisenberg 1995; Crissey 2005; but see Joyce, Kaestner, and Korenman 2000). Recent research demonstrating that unintended births are increasingly concentrated among women at the lower end of the educational spectrum (e.g., Finer and Henshaw 2006) highlights potentially important linkages between patterns of childbearing, inequality, and the reproduction of disadvantage (e.g., Musick et al. 2009).

Previous efforts to understand the educational gradient in unintended fertility have been relatively unsuccessful (Bachrach 2007; Musick et al. 2009). For example, Musick and colleagues find no evidence that differences in women's desired number of children or wages explain the concentration of unintended fertility at the lower end of the educational spectrum (Musick et al. 2009), prompting their proposal of three alternative explanations. First, they suggest that lower education may be associated with more limited access to effective contraception, and to abortion, thus resulting in educational differences in women's ability to control their fertility. Second, mothers' lower education may be associated with greater ambivalence toward childbirth to the extent that it is also associated with more uncertainty about their romantic relationships and their economic circumstances. Third, they emphasize the potential role of differences in efficacy, suggesting that women with lower levels of education may be less likely to believe that they have control over their lives and that this lower level of efficacy may result in more limited efforts to engage in behaviors consistent with their life goals (such as regular contraception). Each of these explanations is plausible in light of related research on marriage and childbearing in "fragile families" (Carlson, McLanahan, and England 2004; Edin and Kefalas 2005; Gibson-Davis, Edin, and McLanahan 2005) but challenging to evaluate empirically given the difficulty of adequately measuring concepts such as contraceptive access, perceptions of stability, and efficacy.

Recognizing the challenges that data limitations pose to the direct evaluation of these hypotheses, we take an indirect approach – seeking insights from a comparison of relationships between educational attainment and unintended fertility in the U.S. and Japan. Cross-national research on educational differences in unintended childbearing in industrialized countries is extremely limited, with only a few studies on countries other than the United States (e.g., Hewitt 2010; Klijzing 2000). To our knowledge, no comparative work has attended to patterns in industrialized countries characterized by very different policy, family, and normative contexts. Japan is a particularly rich source of potential comparative insight given substantial differences with the U.S. in terms of factors relevant to each of the three posited explanations. Of central importance is the fact that early childbearing and nonmarital childbearing – two strong correlates of unintended fertility as well as relationship uncertainty and low efficacy – are far less common in Japan than in the U.S.

Unlike the U.S., the range of contraceptives typically used in Japan is limited primarily to condoms, rhythm, and withdrawal (Sato and Iwasawa 2006). All of these are cheap (or free) and relatively easy to practice, but all have high failure rates relative to irreversible and hormonal methods more commonly practiced in the U.S. (Kost et al. 2008). In this context, we expect the overall level of unintended childbearing to be relatively high and educational differences to be small. At the same time, abortion is widely available and not so expensive as to limit access among the less educated. This suggests that unintended childbearing should be relatively low and that educational differences should be limited.

Relational uncertainty is fundamentally different in Japan given that nearly all births take place within marriage. If ambivalence toward childbearing in the absence of stable partnerships is indeed important for understanding the high levels of unintended childbearing among less-educated women in the U.S., we expect the continued strength of the relationship between marriage and childbearing to limit both overall levels and educational differences in unintended childbearing in Japan. We also expect that the educational gradient in the U.S. should be explained (at least in part) by the high prevalence of nonmarital childbearing among women with lower levels of education. At the same time, we recognize that shifting relationships between sexual activity, pregnancy, and marriage in Japan may contribute to educational

differences in ways that are obscured by the rarity of nonmarital childbearing. As in the U.S., premarital conceptions are rising rapidly in Japan, but these pregnancies typically lead to marriage (or abortion) rather than nonmarital birth. It is clear that the rise in postconception marriages in Japan is most pronounced among those with a high school education or less (Raymo and Iwasawa 2008). If Japanese women's ambivalence toward births due to premarital conceptions is similar to American women's ambivalence toward nonmarital births, we may see relatively high levels of unintended fertility and pronounced educational differences in Japan as well.

Finally, differences in efficacy may also be more limited in Japan given that a much smaller proportion of the population does not graduate from high school and that very few women have births as teenagers or in their early twenties. Existing evidence suggests that both age and educational attainment (or educational aspirations) are positively associated with efficacy (Mirowsky and Ross 2007; Reed, England, Littlejohn, and Conroy 2011). If young women with limited education are more likely to have unintended births that result from a low sense of control (e.g., less selective choice of sexual partners, less regular contraception, less effort to influence partners' use of contraception), the much higher levels of high school completion and the rarity of teenage childbearing in Japan suggest that overall levels of unintended childbearing and educational differences should be relatively limited in Japan. We also expect that differences between Japan and the U.S. in the overall level of unintended childbearing reflects (in part) the concentration of early childbearing among less-educated women in the U.S.

Data and Methods

We use data from the most recent rounds of the National Survey of Family Growth (NSFG) and the Japanese National Fertility Survey (JNFS). These are large, nationally representative surveys of reproductive age women conducted in 2007 and 2005, respectively. Both surveys contain information on the intendedness of each birth, marital history, and educational attainment. The NSFG was conducted six times in the U.S. between 1973 and 2002. In 2007, the National Center for Health Statistics moved to continuous interviewing, and our analyses rely on the first release of these data. In-person interviews were conducted from June 2006 to December 2008 with 7,356 women 15-44 years of age (men were also

interviewed, but less detailed fertility histories were collected, and they are not used here). The overall response rate for the 2006-2008 NSFG was 75%. We limit our analytic sample to births occurring within 5 years of interview (spanning 2001-2008) to women ages 15-39. This sample includes 2,652 births to 2,106 women. The NSFG oversampled Hispanics, blacks, and teens, and sampling weights are used to adjust for differences in sampling rates, response rates, and coverage rates. The JNFS has been conducted every five years in Japan since 1952. The 2005 survey collected information from 6,836 married women and 8,734 unmarried men and women between the ages of 18-49. The response rates were 86% for the married survey and 70% for the unmarried survey. As with the NSFG, we limit our sample to births occurring within 5 years of the interview (2000-2005) to women age 18-39. This sample consists of 2,384 births.

Measures

Fertility intentions: In both surveys, childbearing intentions are ascertained retrospectively in fertility history modules, an approach whose validity has been demonstrated in several previous studies (e.g., a high proportion of couples who report wanting no more children choose sterilization soon after their last wanted birth [Bumpass 1987] and, as previously noted, unintendedness is predictive of child outcomes later in life [Barber, Axinn, and Thornton 1999; Barber and East 2009; Baydar 1995; Brown and Eisenberg 1995; Crissey 2005; but see Joyce, Kaestner, and Korenman 2000]). For each pregnancy, NSFG respondents were first asked whether they were contracepting at the time they became pregnant and, if not, whether it was because they wanted to become pregnant. They were then asked if they wanted another child at the time they became pregnant and, if so, whether the pregnancy came too soon, at about the right time, or too late. Births are intended if a woman discontinued contraceptive use because she wanted to become pregnant and the pregnancy came too late or on time, or if she reported wanting to have a(nother) baby at some time and the pregnancy came too late or on time (it is also standard to include the very small number of women reporting “Didn’t care, indifferent” or Don’t know, not sure” in the intended category). Births are unintended if a woman reported not wanting a(nother) baby or if she felt the pregnancy came too soon. JNFS respondents were asked how each reported pregnancy ended (e.g., in a

live birth, abortion, miscarriage) and whether it was planned, mistimed, or unwanted. In the preliminary analyses summarized below we define unintended childbearing to include both mistimed and unwanted births. One important difference between the two surveys is the fact that Japanese respondents were given the option to respond "I wasn't really thinking about it" (*toku ni kangaete inakatta*). As we show below, a sizable proportion of women selected this response option, thus limiting our ability to directly compare levels of unintended childbearing across the two countries. In analyses of educational differences, we make alternative assumptions about the nature of these responses to assess the sensitivity or results to our treatment of this response option available only to Japanese respondents.

Educational attainment: For both countries, we construct comparable four-category measures of mother's educational attainment. In the NSFG, the categories are less than a high school degree, a high school degree, some college, or a college degree at the time of conception (information on dates of high school completion and education at interview are combined with assumptions about the timing of college attendance and completion to estimate education at conception). In the JNFS, categories for highest completed level of education are: less than high school, high school, junior college or vocational school (two-year degree), and university (four-year degree). This measure refers to highest educational level at the time of the survey, rather than at conception as in the NSFG. We recognize, of course, that relationships between educational attainment and unintended fertility likely operate in both directions (Korenman, Kaestner, and Joyce 2001) and in subsequent revisions will evaluate the sensitivity of results to use of an imputed measure of education at the time of conception.

Marital status: Marital histories, used in conjunction with the fertility histories, allow us to determine women's marital status at the time of conception and birth. We distinguish between marital and nonmarital conceptions, with births occurring outside of marriage or within 8 months of marriage defined as premarital conceptions. In the U.S., the majority of nonmarital conceptions result in nonmarital births, whereas nearly all such conceptions result in births within marriage in Japan (i.e., "bridal pregnancies"). In subsequent analyses, we will estimate models that distinguish nonmarital births from bridal pregnancies in the U.S.

Methods

Our analyses proceed in two steps. In the first step, we describe differences in the level of unintended childbearing in the two countries. Differences in the criteria used to define birth intentions preclude direct comparison but it is useful to have a general sense of the prevalence of unintended childbearing in Japan in light of the theoretical expectations suggesting that it may be either relatively low or relatively high in comparison to the U.S. In the second step, we estimate a series of logistic regressions for unintended childbearing in each country in order to assess the hypothesized roles of early childbearing and nonmarital childbearing (and bridal pregnancy) in explaining educational differences in unintended childbearing. To reiterate, we expect that the negative educational gradient in unintended fertility will be stronger in the U.S. and that this gradient should be largely explained by the concentration of nonmarital births at relatively young ages among women with lower levels of education.

Results

Table 1 summarizes childbearing intentions by mother's educational attainment for the U.S. and Japan. Treating ambiguous responses (i.e., the substantial number reporting "I wasn't really thinking about it" in Japan vs. the very small share reporting "Didn't care, indifferent" or Don't know, not sure" in the U.S.) as intended births (first two columns), it is clear that unintended childbearing is much higher in the U.S. (.42) than in Japan (.18). Figures for the U.S. show a strong negative educational gradient, ranging from .54 for those who did not complete high school to .18 for college graduates. In Japan, the prevalence of unintended childbearing is highest among women in the lowest educational group (.37), a very small and increasingly select group (Raymo and Iwasawa 2008). Among women who have completed at least a high school degree, there is little evidence of any educational gradient. If we treat ambiguous responses as unintended births (right two columns), the two countries look much more similar, with 43% of births unintended in the U.S. and 40% unintended in Japan. This does little to alter the pattern of educational differences in Japan, with the roughly 20% of births moving from intended to unintended distributed across all four educational groups.

Table 2 presents predicted probabilities of an unintended birth by educational attainment from three logistic regression models motivated by the preceding discussion of the explanations suggested by Musick et al. (2009). The baseline model includes only educational attainment, a categorical indicator of parity, and (in the U.S.) dichotomous variables distinguishing Blacks and Hispanics from Whites. Predicted probabilities are evaluated varying education and holding all other variables in the model at their mean values. Below each predicted probability, we indicate whether the coefficient associated with a given level of education is significantly different from that associated with lower levels of education (thus summarizing all two-way comparisons of educational categories). Again, we estimate separate models for the two alternative treatments of ambiguous responses to the fertility intentions question.

In the U.S., the baseline model shows the clear negative educational gradient, with the predicted probability of an unintended birth at each level of education significantly lower than at all lower levels of education. The second model indicates that differences among women in all but the highest educational category reflect differences in age at conception. Controlling for the younger age at conception among those with lower levels of education, differences in predicted levels of unintendedness disappear among women with some college or less. This is potentially consistent with a scenario in which lower levels of efficacy help to explain the higher prevalence of unintended births among women with more limited education. College graduates remain significantly less likely to report an unintended birth, although the relative difference is much smaller than in the baseline model. The third model indicates that the relatively low prevalence of unintended births among the most highly-educated women reflects their relatively low likelihood of having a nonmarital conception. Controlling for the strong link between nonmarital conception and unintended birth, the predicted probability of an unintended birth is no different among college graduates as compared to women with a high school degree or less. This is potentially consistent with an emphasis on greater relationship uncertainty among women at the low end of the education distribution in the U.S. After accounting for age and marital status at conception, the only remaining difference across education groups in the predicted probability of an unintended birth is the high prevalence among women with some college relative to college graduates. In light of recent

attention to the family behavior of this group (Cherlin 2010), this is an interesting – and somewhat puzzling – finding.

The baseline model for Japan replicates the pattern in Table 1, with unintended childbearing highest among the small group of women who did not complete high school and no differences among women with at least a high school education. Controlling for the link between young childbearing and unintended births in Model 2 explains the difference between women in the lowest and highest educational categories and also results in a significantly higher prevalence of unintendedness among university graduates relative to junior college/vocational school graduates (i.e., some college). Similarly, controlling for the relationship between nonmarital conceptions and unintended births, the prevalence of unintendedness among college graduates becomes significantly higher than high school graduates as well. So, in contrast to the U.S., where the educational gradient is largely explained by later childbearing within marriage among more highly educated women, there appears to be a U-shaped relationship between educational attainment and unintended births in Japan. Because patterns for the alternative definition of unintended childbearing (lower panel) are largely similar, we do not describe them here.

Plans for further analysis

In subsequent revisions, we will build on these preliminary analyses in the following ways: (a) distinguish between mistimed and unwanted childbearing, (b) assess whether relationships between education and unintended childbearing differ by mothers' age at birth (e.g., via the estimation of non-proportional transition rate models), (c) consider alternative treatments of cohabiting unions in the U.S. (we have treated births to cohabiting women as nonmarital births in the preliminary tabulations presented here), (d) examine relationships between unintended childbearing and other indicators of mothers' socioeconomic status (e.g., parental education) given endogeneity between unintended childbearing and education, and (e) examine change in educational differences across cohorts using multiple rounds of the NSFG and NSF.

References

Barber, J. S., W. G. Axinn, and A. Thornton. 1999. "Unwanted Childbearing, Health, and Mother-Child Relationships." *Journal of Health and Social Behavior* 40:231-257.

Barber, J. S. and P. L. East. 2009. "Home and Parenting Resources Available to Siblings Depending on Their Birth Intention Status." *Child Development* 80:921-939.

Baydar, N. 1995. "Consequences for Children of their Birth Planning Status." *Family Planning Perspectives* 27:228-245.

Brinton, M. C. 1992. "Christmas Cakes and Wedding Cakes: The Social Organization of Japanese Women's Life Course." Pp. 79-107 in *Japanese Social Organization*, edited by T. S. Lebra. Honolulu, HI: University of Hawaii Press.

Brown, S. S., and L. Eisenberg. 1995. *The Best Intentions: Unintended Pregnancy and the Well-being of Children and Families.* Washington D.C.: National Academy Press.

Bumpass, Larry L. 1987. “The Risk of an Unwanted Birth: The Changing Context of Contraceptive Sterilization in the U.S.” *Population Studies* 41:347–363.

Carlson, M., S. McLanahan, and P. England. 2004. "Union Formation in Fragile Families." *Demography* 41:237-261.

Crissey, S. R. 2005. “Effect of Pregnancy Intention on Child Well-Being and Development: Combining Retrospective Reports of Attitude and Contraceptive Use.” *Population Research and Policy Review* 24:593-615.

Ellwood, D. T. and C. Jencks. 2004. "The Uneven Spread of Single Parent Families: What Do We Know? Where Do We Look for Answers?" Pp. 3–78 in *Social Inequality*, edited by K. Neckerman. New York: Russell Sage Foundation.

Finer, L. B. and S. K. Henshaw. 2006. "Disparities in Rates of Unintended Pregnancy in the United States, 1994 and 2001." *Perspectives on Sexual and Reproductive Health* 38:90-96.

Gibson-Davis, C. M., K. Edin, and S. McLanahan. 2005. "High Hopes but Even Higher Expectations: the Retreat From Marriage Among Low-Income Couples." *Journal of Marriage and the Family* 67:1301-1312.

Hamilton, B. E., J. A. Martin and S. J. Ventura. 2009. *Births: Preliminary Data for 2007*. National Vital Statistics Reports 57(12). Released March 18. Available at: http://www.cdc.gov/nchs/data/nvsr/nvsr57/nvsr57_12.pdf.

Hewitt, B., P. England, J. Baxter, and E. F. Shafer. 2010. "Education and Unintended Pregnancies in Australia: Do Differences in Relationship Status and Age at Birth Explain the Education Gradient?" *Population Review* 49:36-52.

Klijzing, E. 2000. "Are there Unmet Family Planning Needs in Europe?" *Family Planning Perspectives* 32:74-88.

Korenman, S., R. Kaestner, and T. J. Joyce. 2001. "Unintended Pregnancy and the Consequence of Nonmarital Childbearing." Pp. 259-286 in Out of Wedlock: Causes and Consequences of Nonmarital Fertility, edited by L. L. Wu and B. Wolfe. New York, NY: Russell Sage Foundation.

Kost, K., S. Singh, B. Vaughan, J. Trussell, and A. Bankole. 2008. “Estimates of Contraceptive Failure from the 2002 National Survey of Family Growth.” *Contraception* 77(1):10-21.

McLanahan, S. 2004. "Diverging Destinies: How Children are Faring Under the Second Demographic Transition." *Demography* 41:607-627.

Musick, K., P. England, S. Edgington, and N. Kangas. 2009. "Education Differences in Intended and Unintended Fertility." *Social Forces* 88:543-572.

Preston, S. H. and C. S. Hartnett. 2008. "The Future of American Fertility." NBER working papers no. 14498. National Bureau of Economic Research, Cambridge, MA.

Raymo, J. M. and M. Iwasawa. 2008. "Bridal Pregnancy and Spouse Pairing Patterns in Japan." *Journal of Marriage and Family* 70:847-860.

Sato, R. and M. Iwasawa. 2006. "Contraceptive Use and Induced Abortion in Japan: How Is It So Unique among the Developed Countries?" *Japanese Journal of Population* 4:33-54.

Table 1: Prevalence of unintended births within 5 years of interview to women age 15-39, by mother's education and country

	DK=Intended		DK=Unintended	
Education	U.S.	Japan	U.S.	Japan
<High School	0.54	0.37	0.55	0.58
High School	0.49	0.19	0.50	0.43
Some College	0.41	0.16	0.42	0.36
University	0.18	0.19	0.18	0.39
Total	0.42	0.18	0.43	0.40

Table 2: Predicted probabilities of unintended births within 5 years of interview to women age 15-39, by mother's education and country

		Don't know = Intended		
Education	<High School	High School	Some College	University
U.S.				
Baseline model	0.54	0.48	0.41	0.18
		>	>, >	>, >, >
+ age at conception	0.43	0.42	0.44	0.31
		x	x, x	>, >, >
+marital status at conception	0.39	0.40	0.44	0.36
		x	x, x	x, x, >
Japan				
Baseline model	0.35	0.18	0.16	0.19
		>	>, x	>, x, x
+ age at conception	0.28	0.16	0.16	0.21
		>	>, x	x, <, x
+marital status at conception	0.25	0.14	0.15	0.20
		>	>, x	x, <, <

		Don't know = Unintended		
Education	<High School	High School	Some College	University
U.S.				
Baseline model	0.56	0.49	0.41	0.18
		>	>, >	>, >, >
+ age at conception	0.44	0.43	0.46	0.31
		x	x, x	>, >, >
+marital status at conception	0.42	0.41	0.45	0.36
		x	x, x	x, x, >
Japan				
Baseline model	0.57	0.43	0.35	0.40
		>	>, >	>, x, x
+ age at conception	0.53	0.41	0.36	0.42
		x	x, x	x, x, x
+marital status at conception	0.50	0.40	0.36	0.43
		x	>, x	x, x, <

Note: > indicates significantly less than lower category at p <. 05, < indicates significantly greater than lower category at p <. 05, x indicates not significantly different from lower category at p <.05