The Education Gradient on
Unintended (versus Intended) Fertility:
Australia and the United States

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Abstract

We show that women and men with less education have a higher ratio of unintended (mistimed or unwanted) to intended births in both Australia and the United States. The two nations differ in that income inequality is higher in the United States and the U.S. lacks the universal health care available in Australia (which includes access to contraception and abortion). The fact that the two nations have a similar tendency of the less educated to have more unintended relative to intended births suggests a similar cause in both nations. We use multivariate analysis and mediation models to illuminate explanations of the education disparities, using the U.S. NLSY data and the Australian HILDA data.

Introduction

In this paper, we use similar intendedness measures from the U.S. NLSY and the Australian HILDA panel data to examine education differences in whether women's most recent birth was intended or unintended (breaking the latter category into mistimed and unwanted). We limit ourselves to the most recent birth, because the Australian HILDA panel only asked intendedness questions about this birth. We assess the effect of education (and sometimes predicted education) on the planning status of women's births, and use covariates to attempt to explain the relationship. We also take the unusual step of examining births from the father's perspective as both data sets asked men about the intendedness of the births they fathered. We find that in both nations, less educated women and men have more of their births unintended. This is interesting since Australia differs from the U.S. in having a slightly less unequal distribution of household incomes and less relative poverty and in having universal provision of health care (Munzi and Smeeding forthcoming). We use mediation models to attempt to illuminate reasons for the education disparities in intendedness, controlling for ethnicity, age, and parity, and focusing on parity, partnership status, income, class, occupational status, and available attitude measures.

Background Literature

In the U.S., less educated women have higher fertility (Yang and Morgan 2003). But they have fewer intended births than more educated and higher earning women, contrary to what one would expect based on opportunity costs (Musick et al. 2007). Indeed, the entire education/fertility gradient comes from less educated women's higher unintended fertility (Musick et al. 2007, using the NLSY, separately for whites and

blacks). Thus, a much higher proportion of the pregnancies of U.S. women with low education are unintended (Finer and Henshaw 2006, relying on the 2002 NSFG). Moreover, these disparities in unintended versus intended fertility are longstanding (Rainwater 1960). Given lack of universal health care in the U.S., poor women might have more unintended births because of their lack of access to contraception and abortion; there is some support for this as regards abortion (Morgan and Parnell 2002), but no clear supportive evidence regarding contraception (Silverman et al. 1987; Edin et al. 2007; Morgan and Parnell 2002). If a culturally similar society, Australia, which differs in having universal health care, shows the same tendency of the less educated to have a higher percentage of their births be unintended, it suggests that health care access is not the main explanation.

Most economic work on fertility assumes that any education gradient on number of children is driven by opportunity costs; more educated women lose more in income by reducing employment for childbearing. This view undoubtedly has some validity, but it is hard pressed to explain the intendedness patterns because, on the face of it, opportunity cost calculations should apply more to intended fertility, but, as mentioned above, Musick et al. (2007) found an elevated hazard of intended fertility (relative to no birth) among women with more education and higher wages, the opposite of what the perspective would predict. They also showed that women with low predicted (or later achieved) education did not start out with higher fertility aspirations; women of all race/education groups wanted 2 at the median.

Why, then, might we expect more of less educated women's children to be unintended? Musick et al. (2007) suggest three possibilities: that less educated, more disadvantaged women have less access to health care services, more unstable unions, or less contraceptive efficacy (as part of less efficacy and self-regulation and more fatalism in many domains of life). To the extent that measures allow, we will explore these and other alternatives here.

Data and Methods

The Australian data come from wave 5 of The Household, Income and Labour Dynamics in Australia (HILDA) survey. Wave 1 was collected in 2001 comprising 7,682 households and 13,969 individuals (Watson & Wooden 2002). Within households, data were collected from each person aged over 15 years. Successive waves have continued until Wave 5 in 2005 (Melbourne Institute of Applied Economic and Social Research 2007). Only Wave 5 included the special module for the United Nations fertility study, providing detailed information about respondent's most recent pregnancy. This was restricted to female respondents aged 18 to 44 and males 18 to 54. Our analytic sample therefore comprises 1571 men and 1766 women included in this special module.

The dependent variable measuring intendedness is derived from two questions about respondents' most recent pregnancy. The first question used asks whether the respondent wanted the baby, with responses of 1 = yes, 2 = no, 3 = not sure, 4 = adopted. Those who answered "no" were coded "unwanted." (This differs somewhat from the NLSY and NSFG approach of considering it unwanted if R says she never wanted another child at the time she got pregnant.) We drop out respondents who adopted. The second question asked whether the pregnancy occurred sooner than R wanted it, later than wanted, or about the right time. A pregnancy was coded intended if the pregnancy

was wanted and came about the right time or later than wanted. A pregnancy was unintended but mistimed if it was wanted, but came earlier than expected. Finally, a pregnancy was unintended and unwanted if the respondent answered no to the first question. Thus pregnancies are intended or unintended with the latter category divided into mistimed and unwanted.

We perform multinomial logistic regression predicting whether the most recent pregnancy was intended (the reference), mistimed, or unwanted from education and other covariates.

Our primary independent variable is education, the highest level of education achieved the year before the pregnancy (to avoid endogeneity of education to fertility). It has 4 categories: 1 = less than yr 12 (did not finish high school); 2 = completed yr 12 (completed high school); 3 = post-school qualification (including trade qualifications); 4 = college degree (includes bachelor's degrees and advanced diplomas). Some models add controls to assess mechanisms. We include a measure for partnered status in the year prior to the birth of the youngest child, with partnered including married or cohabiting (referred to as "defacto married" in Australian data) and single as the alternative, with a dummy for missing responses on partnered status. We also include continuous measures for age at most recent birth and year of most recent birth. An indicator for parity prior to most recent pregnancy was also included. Finally we control for ethnic background, coded 1 = Australian born, 2 = overseas born – English speaking country, 3 = overseas born – non-English speaking country. Other covariates will be added.

We do not include a description of the NLSY in this extended abstract, since it is better known to PAA members. We will perform parallel analyses for NLSY women and men to those performed on HILDA.

Preliminary Results

We present preliminary results from HILDA here. Table 1 provides descriptive statistics on preliminary variables (more covariates will be used eventually). Table 2 shows simple descriptive statistics on the percent of women's and men's most recent births that were intended, mistimed, and unwanted by education. There is clearly an education gradient on intendedness; for women 61% of births to women with less than 12 years (less than high school) were intended, while the comparable figure for college graduates was 76%. Unwanted shows the reverse pattern; 24% of births to women with less than high school were unwanted, but only 9% of those to college graduates. Mistimed is also more common for the lower than higher educated. Similar education/intendedness relationships exist for men as women, suggesting that, in the aggregate, male and female partners see intendedness similarly. The "post-school qualifications" group which contains persons with vocational training sometimes undertaken after high school, but sometimes undertaken by those who did not finish high school often creates a nonmonotonic relationship; they behave more like the high school drop outs without trade qualifications. (We will continue to experiment with ways to code education.) In results not shown we examined similar statistics for the U.S., separately for whites and blacks, and find a similar gradient for both groups.

Tables 3 and 4 show our preliminary multinomial logistic regressions predicting whether an Australian woman's or man's last birth was intended (the reference), mistimed, or unwanted. Education is entered with and without controls. We see that,

without controls, college-educated women (relative to the least educated group, those with less than 12 years) have fewer mistimed and many fewer unwanted births (relative to intended births). Controls for partnership status, age, year, parity and ethnic background render the effect of education on mistimed (relative to intended) nonsignificant. In future work, we will explore which variables are mediating the effect (or, if exogenous, showing its spuriousness). Controls eliminate roughly a third of the relationship between college education (relative to the lowest group) and unwanted (relative to intended) pregnancies. The multivariate results for men are very similar to those for women.

Effects of control independent variables show that more of women's pregnancies are unintended if they are single and younger; this applies to mistimed and unwanted. Unwantedness (but not mistimed) is predicted by having more children already and being born overseas in a non-English speaking nation.

Additional Analyses We'll Do for PAA Paper
Our intent in the proposed analysis is to do parallel analyses (as is possible) for HILDA and NLSY, and for men and women. (In the NLSY men were also asked intendedness questions, but a more truncated set of questions than women were asked.) Our intent is to describe the education/intendedness gradient in both nations, and to seek to use covariates to assess what factors explain the common gradient in the two nations.

References
Edin, Kathryn, Paula England, Emily Fitzgibbons Shafer, and Joanna Reed. 2007. "Forming Fragile Families: Was the Baby Planned, Unplanned, or In Between?" in *Unmarried Couples with Children*, edited by Paula England and Kathryn Edin. New York: Russell Sage Foundation.

Finer, Lawrence B. and Stanley K. Henshaw. 2006. "Disparities in Rates of Unintended Pregnancy in the United States, 1994 and 2001." *Perspectives on Sexual and Reproductive Health* 38(2):90-96.

Huang, Chien-Chung. 2005. "Pregnancy intention from men's perspectives: does child support enforcement matter?" *Perspectives on Sexual and Reproductive Health* 37:.

McDonald, Peter. 2000. "Gender Equity in Theories of Fertility Transition." *Population and Development Review* 26,3:427-439.

Melbourne Institute of Applied Economic and Social Research. 2007. *HILDA survey annual report 2006*, The University of Melbourne, Melbourne, Australia.

Morgan, S. Philip and Allan Parnell. 2002. "Effects on Pregnancy Outcomes of Changes in the North Carolina State Abortion Fund," *Population Research and Policy Review* 21(4):319-338.

Munzi, Teresa and Timothy Smeeding. Forthcoming. "Conditions of Social Vulnerability, Work and Low Income: Evidence for Europe in Comparative Perspective." Forthcoming in *Institutions for Social Well-being, Alternatives for Europe*, edited by Lilia Costabile. London: Palgrave- Macmillan.

Musick, Kelly, Paula England, Sarah Edgington, and Nicole Kangas. 2007. "Education Differences in Intended and Unintended Fertility." Unpublished paper; a previous version presented at 2006 PAA.

Rainwater, Lee. 1960. *And the Poor Get Children: Sex, Contraception, and Family Planning in the Working Class*. Chicago: Quadrangle.

Silverman, Jane, Aida Torres, and Jacqueline Darroch Forrest. 1987. "Barriers to Contraceptive Services." *Family Planning Perspectives* 19(3):94-97.

Watson N, Wooden M. 2002. Assessing the Quality of the HILDA Survey Wave 1 Data. Rep. HILDA project technical paper series, No. 4/02, Department of Family and Community Services, and The University of Melbourne, Melbourne, Australia.

Yang, Yang and S. Philip Morgan. 2003. "How Big Are Educational and Racial Fertility Differentials in the U.S.?" *Social Biology* 50(3/4):167-187.

Table 1:Means (proportions for categorical) and standard deviations[a] of model variables

	Men		Women	
	Mean	SD	Mean	SD
Pregnancy intentions:				
Intended	.67		.64	
Unintended				
Mistimed	.17		.19	
Unwanted	.16		.17	
Education:				
Less than yr 12	.24		.31	
Completed yr 12	.10		.17	
Post-secondary qualification	.35		.18	
College degree	.31		.34	
Controls:				
Relationship status at most recent pregnancy:				
Partnered	.75		.77	
Single	.21		.23	
Missing	.04		.00	
Age at most recent birth	32.5	5.9	29.33	5.2
Year of most recent birth	1998	5.6	1998	2.5
Number of children	1.30	1.1	1.3	1.1
Ethnic background:				
Australian	.80		.80	
Overseas born – English speaking	.09		.07	
Overseas born – non-English speaking	.11		.13	
N	1,567		1,766	

a   Note that standard deviations are only reported for continuous measures.

Table 2:Distribution of education and Intended or Unintended pregnancy, by sex.

	Less than Yr 12	Completed Yr 12	Post-school qual	College degree	Total
	%	%	%	%	%
	Women (n=1,766)				
Intended	60.5	60.8	65.1	76.4	64.7
Mistimed	21.2	24.7	17.2	14.3	16.5
Unwanted	24.5	14.6	17.6	9.4	16.3
Total	100	100	100	100	100
Pearson chi2(6)			65.09 Pr .000		
	Men (n=1,567)				
Intended	56.7	67.2	56.1	74.7	64.5
Mistimed	20.0	19.1	20.1	15.8	18.4
Unwanted	23.3	13.7	23.8	9.5	17.1
Total	100	100	100	100	100
Pearson chi2(6)			49.02 Pr .000		

Table 3: Multinomial Logistic Regression Model Predicting Unwanted or Mistimed (relative to Intended) Last Pregnancy, Women

Variables	Model (no controls) Unintended:				Models (controls) Unintended:			
	Mistimed		Unwanted		Mistimed		Unwanted	
	β	se	β	se	B	se	β	se
Education:								
Less than yr 12 (ref)	-		-				-	
Completed yr 12	-0.22	.19	-0.71***	.20	-0.05	.20	-0.52*	.21
Post-secondary qualification	0.008	.18	0.03	.17	-0.004	.20	0.15	.18
College degree	-0.51**	.16	-1.16***	.17	0.05	.18	-0.73***	.19
Controls:								
Relationship status at most recent pregnancy:								
Partnered (ref)					-		-	
Single					1.09***	.16	1.12***	.16
Age at most recent birth					-0.12***	.02	-0.06**	.02
Year of most recent birth					0.04**	.01	0.003	.01
Number of children					0.07	.07	0.43***	.06
Ethnic background:								
Australian (ref)					-		-	
Overseas born – English speaking					-0.29	.29	0.04	.27
Overseas born – non-English speaking					0.10	.22	0.86***	.19
N	1,766				1,766			

*p<.05, **p<.01, ***p<.001   Note: Intended is the reference category for the dependent variable.

Table 4: Multinomial Logistic Regression Model Predicting Unwanted or Mistimed (relative to Intended) Last Pregnancy, Men

Variables	Model (no controls)				Models (controls)			
	Unintended:				Unintended:			
	Mistimed		Unwanted		Mistimed		Unwanted	
	β	se	β	se	B	se	β	se
Education:								
Less than yr 12 (ref)	-		-		-		-	
Completed yr 12	0.50*	.24	-0.52*	.26	0.49	.26	-0.15	.28
Post-secondary qualification	0.07	.19	-0.40*	.17	0.16	.20	-0.24	.18
College degree	-0.27	.20	-1.19***	.20	0.07	.21	-0.88***	.21
Controls:								
Relationship status at most recent pregnancy:								
Partnered (ref)					-		-	
Single					0.98***	.18	1.16***	.17
Missing					-0.22	.36	-1.05	.56
Age at most recent birth					-0.07***	.01	-0.03*	.01
Year of most recent birth					-0.05**	.01	-0.03*	.01
Number of children					-0.01	.08	0.34***	.06
Ethnic background:								
Australian (ref)					-		-	
Overseas born – English speaking					-0.25	.27	0.40	.25
Overseas born – non-English speaking					0.04	.25	0.68**	.22
N	1567				1567			

*p<.05, **p<.01, ***p<.001