Birth Spacing and Fertility in the Presence of Son Preference and Sex-Selective Abortions: India's Experience Over Four Decades

Online Appendices

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Text and code for this paper are available at
https://github.com/cportner/sexSelectionSpacing

Appendices for Online Publication

These appendices are intended for online publication. They provide the descriptive statistics, additional estimated duration tables, and graphs for all education groups and spells.

A Characteristics of Women's Work Experiences

Figure A.1 shows the percent of married women who are currently working at the time of the survey by age group and education level. No other labor force participation question is consistently available across all four surveys. Because the question refers to currently working, the percentages are lower in previous studies.

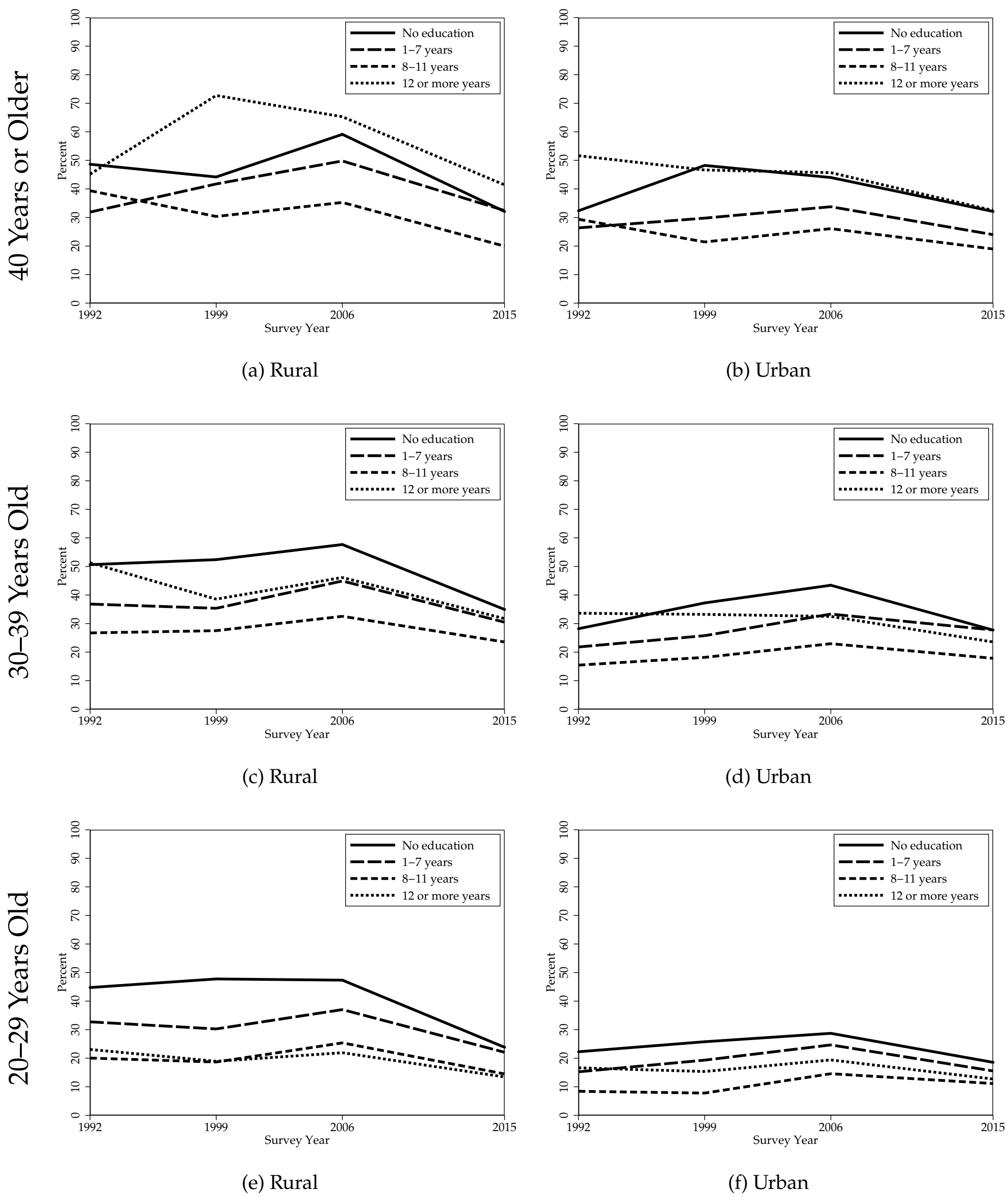
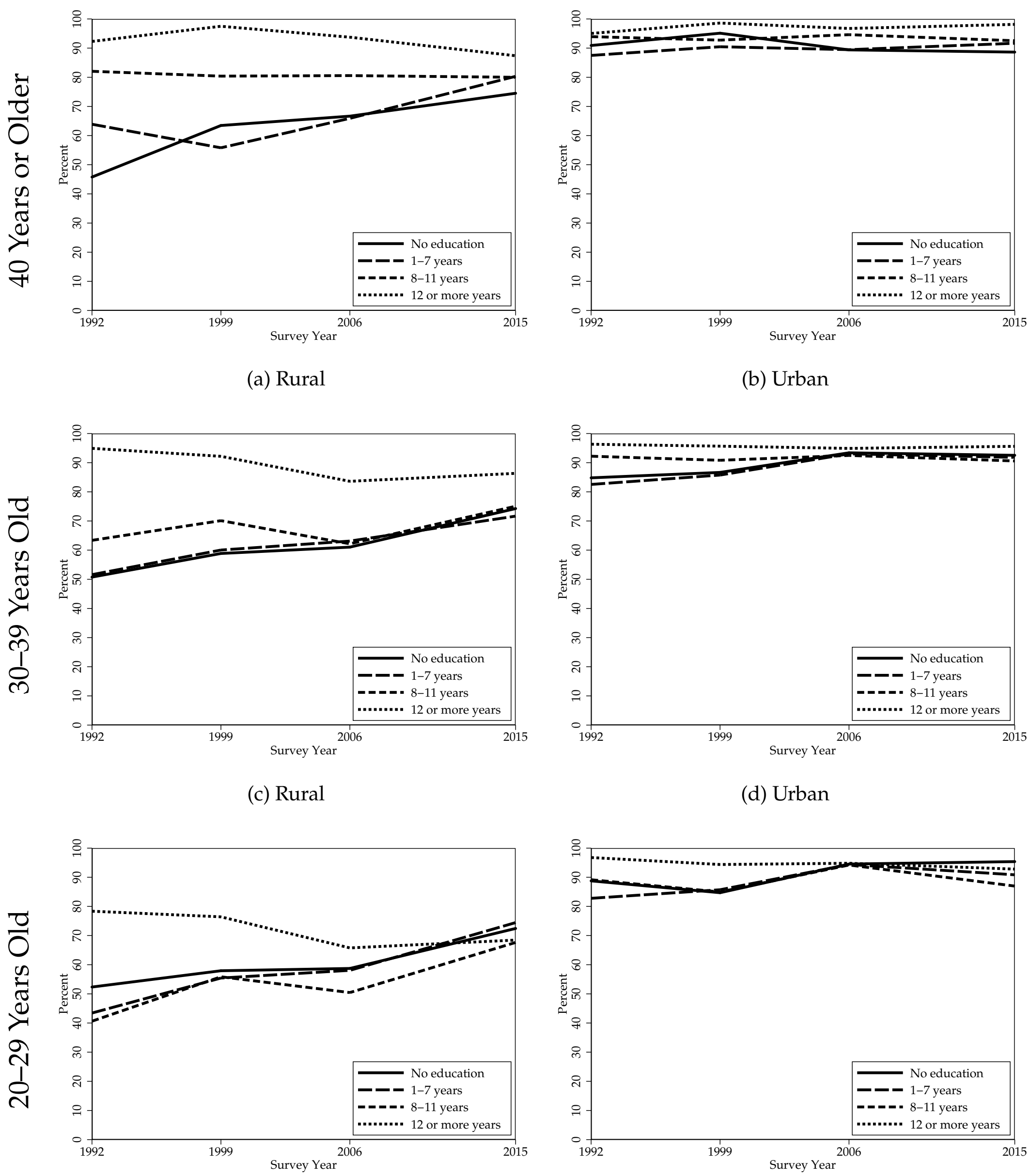


Figure A.1: Percentage of married women who were working at the time of the survey by age group and area of residence

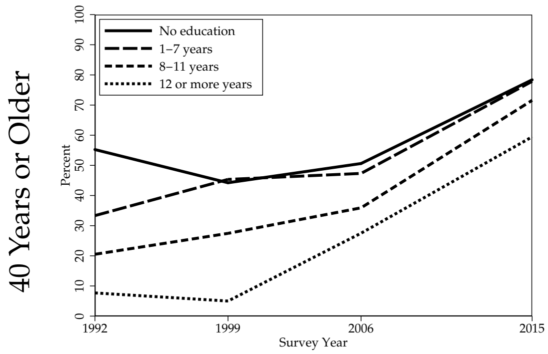


(a) Rural (b) Urban

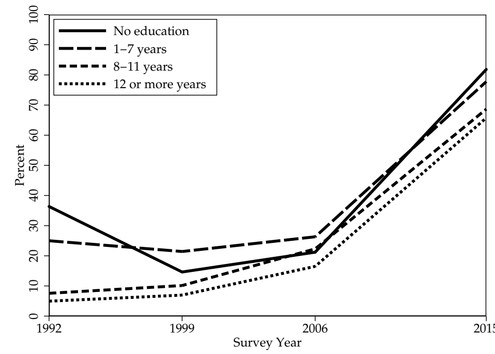
(c) Rural (d) Urban

(e) Rural (f) Urban

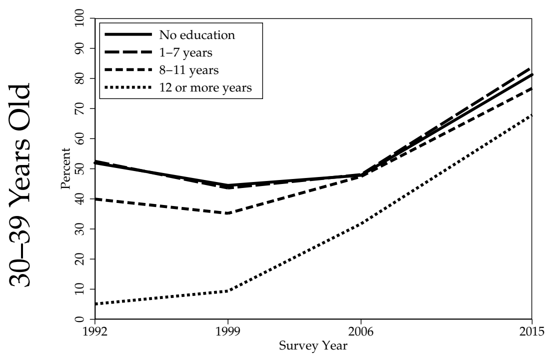
Figure A.2: Percentage of women paid cash or cash and in-kind of those women who were working at the time of the survey by age group and area of residence



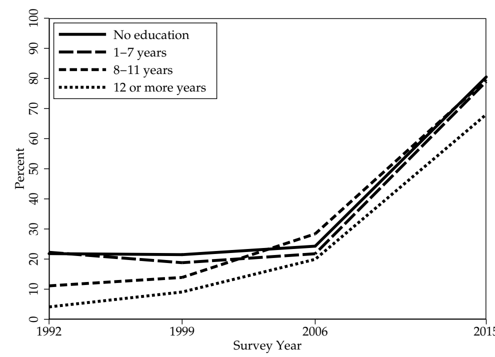
(a) Rural



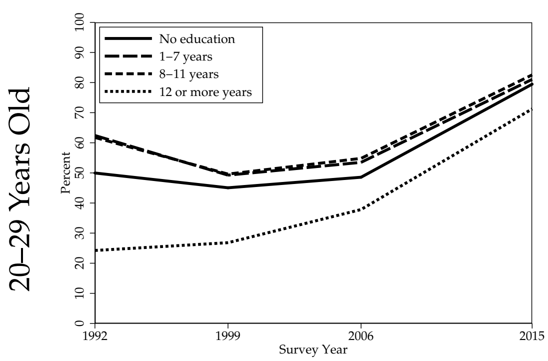
(b) Urban



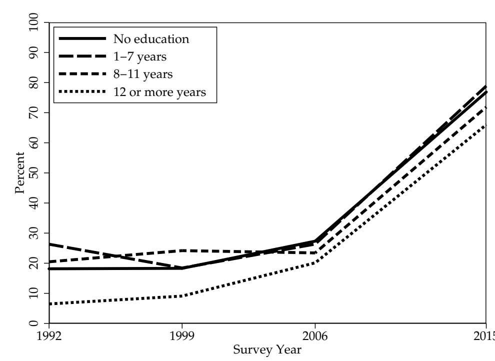
(c) Rural



(d) Urban



(e) Rural



(f) Urban

Figure A.3: Percentage women who worked for a family member of those working at the time of the survey, by age group and area of residence

B Empirical Model Details

The model is a discrete time, nonproportional, competing risk hazard model with two exit states: Either a boy or a girl is born. The unit of analysis is a spell, the period from nine months after one birth to the next. For each woman, $i = 1, \ldots, n$, the starting point for a spell is time $t = 1$, and the spell continues until time t_i, when either a birth occurs or the spell is censored.[1] There are two exit states: The birth of a boy, $j = 1$, or the birth of a girl, $j = 2$, and J_i is a random variable indicating which event took place. The discrete time hazard rate h_{ijt} is

$$h_{ijt} = \frac{\exp(D_j(t) + \alpha'_{jt}\mathbf{Z}_{it} + \beta'_j\mathbf{X}_i)}{1 + \sum_{l=1}^{2}\exp(D_j(t) + \alpha'_{lt}\mathbf{Z}_{it} + \beta'_l\mathbf{X}_i)} \quad j = 1, 2 \tag{1}$$

where the explanatory variable vectors, $\mathbf{Z}_{it}$ and $\mathbf{X}_i$, capture individual, household, and community characteristics, and $D_j(t)$ is the piece-wise linear baseline hazard for outcome j, captured by dummies and the associated coefficients,

$$D_j(t) = \gamma_{j1}D_1 + \gamma_{j2}D_2 + \ldots + \gamma_{jT}D_T, \tag{2}$$

with $D_m = 1$ if $t = m$ and zero otherwise. This approach to modeling the baseline hazard is flexible and does not place overly strong restrictions on the baseline hazard.

The explanatory variables in $\mathbf{Z}$, and the interactions between them, constitute the nonproportional part of the model, which means that they are interacted with the baseline hazard:

$$\mathbf{Z}_{it} = D_j(t) \times (\mathbf{Z}_1 + Z_2 + \mathbf{Z}_1 \times Z_2), \tag{3}$$

where $D_j(t)$ is the piece-wise linear baseline hazard, $\mathbf{Z}_1$ captures sex composition of previous children, if any, and Z_2 captures area of residence. The remaining explanatory variables, $\mathbf{X}$, enter proportionally, but to further minimize any potential bias from assuming proportionality, estimations are done separately for different levels of mothers' education and different periods.

Equation (1) is equivalent to the logistic hazard model and has the same likelihood function as the multinomial logit model (Allison, 1982; Jenkins, 1995). Hence, transforming the data, so each observation is an interval—here equal to three months—the model can be estimated using a standard multinomial logit model.

The distribution of spacing is captured by the survival curve, which shows the probability of not having had a birth yet by spell duration, for a given set of explanatory variables. The survival curve at time t is

$$S_t = \prod_{d=1}^{t}\left(\frac{1}{1 + \sum_{l=2}^{2}\exp(D_j(t) + \alpha'_{ld}\mathbf{Z}_{kd} + \beta'_l\mathbf{X}_k)}\right). \tag{4}$$

Interpretation of the model coefficients is challenging (Thomas, 1996). It is, however, possible to calculate the predicted probabilities of having a boy, b, and of having a girl, g,

[1] The time of censoring is assumed independent of the hazard rate, as is standard in the literature.

in period t, conditional on a set of explanatory variables and not having had a child before that period, as

$$P(b_t|\mathbf{X}_k, \mathbf{Z}_{kt}, t) = \frac{\exp(D_j(t) + \alpha'_{1t}\mathbf{Z}_{kt} + \beta'_1\mathbf{X}_k)}{1 + \sum_{l=1}^{2}\exp(D_j(t) + \alpha'_{lt}\mathbf{Z}_{kt} + \beta'_l\mathbf{X}_k)} \tag{5}$$

$$P(g_t|\mathbf{X}_k, \mathbf{Z}_{kt}, t) = \frac{\exp(D_j(t) + \alpha'_{2t}\mathbf{Z}_{kt} + \beta'_2\mathbf{X}_k)}{1 + \sum_{l=2}^{2}\exp(D_j(t) + \alpha'_{lt}\mathbf{Z}_{kt} + \beta'_l\mathbf{X}_k)} \tag{6}$$

It is then straightforward to calculate the estimated percentage of children born that are boys, $\hat{Y}$, at each t:

$$\hat{Y}_t = \frac{P(b_t|\mathbf{X}_k, \mathbf{Z}_{kt}, t)}{P(b_t|\mathbf{X}_k, \mathbf{Z}_{kt}, t) + P(g_t|\mathbf{X}_k, \mathbf{Z}_{kt}, t)} \times 100. \tag{7}$$

Combining the percentage boys and the likelihood of exiting the spell across all t gives the predicted percent boys born over the entire spell.[2]

[2]Imagine $T = 2$. If 54% and 66% of births are boys and the likelihood of giving birth 20% and 40%, then the predicted sex ratio is $\frac{54*0.2+66*0.4}{0.2+0.4} = 62\%$ boys.

C Recall Error and the Sex Ratio

The reliability of the results depends on the correctness of the birth histories provided by the respondents. A significant concern here is underreporting of child mortality, especially a systematic recall error where respondents' likelihood of reporting a deceased child depends on the sex of that child. This appendix section assesses the degree of recall error across the surveys and discusses methods to address it.

NFHS enumerators probe for any missed births, although the method depends on the survey. NFHS-1 probe for each calendar birth interval that is four or more years. NFHS-2 asked for stillbirths, spontaneous and induced abortions and also probed for each calendar birth interval four or more years. NFHS-3 and NFHS-4 did not directly use birth interval lengths, but asked whether there were any other live births between (name of previous birth) and (name), including any children who died after birth, and asked for births before the birth listed as first birth and after the last birth listed as the last birth.

Probing catches many initially missed births, but systematic recall error based on son preference may still be a problem. First, son preference leads to significantly higher mortality for girls than boys. Secondly, son preference makes it more likely that parents will remember deceased boys than deceased girls. Finally, in the absence of sex-selective abortions, parents with a preference for sons may have the next birth sooner if the last child was a girl than if it was a boy. If this girl subsequently dies, she is more likely to be missed if probing for missed births is only done for long intervals as in NFHS-1 and NFHS-2.

I use two approaches to examine the degree of recall error. The first approach is to test whether the observed sex ratio is significantly different from the natural sex ratio. The natural sex ratio is approximately 105 boys to 100 girls or 51.2% (Jacobsen, Moller and Mouritsen, 1999; Pörtner, 2015). Prenatal sex determination techniques did not become widely available until the mid-1980s, so any significant deviation from the natural sex ratio before that time is likely the result of recall error. The second approach is to compare births that took place during the same period but where captured in different surveys. Recall error is likely to increase with time, so births and deaths that took place earlier are more likely to be subject to recall error than more recent events.

Table C.1 shows the sex ratios of children recorded as first-born by year of birth, together with tests for whether the observed sex ratio is significantly higher than the natural sex ratio and whether more recent surveys have a higher sex ratio for the cohort than earlier surveys for the same period births. Births are combined into five-year cohorts to achieve sufficient power.

The "first-born" sex ratios illustrate the systematic recall error problem well. In all four surveys around 55% of children reported as first-born are boys for the first cohort of births observed. Given that these cohorts cover from 1960-1964 to 1980-1984, which is before sex selection techniques became available in India, the most likely explanation for the skewed sex ratio is that some children listed as first-borns were not, in fact, the first children born in their families. Instead, for a substantial proportion of families, their first-born was a girl who died and went unreported when enumerators asked about birth history.

As expected, the difference between the observed sex ratio and the natural sex ratio is less pronounced the closer to the survey date the cohort is. The observed sex ratio for children born just before the NFHS-1 survey and listed as first-born is 0.517, which is not

Table C.1: Observed Ratio of Boys for Children Listed as First-born by Year of Birth in Five-Year Cohorts

	NFHS-1 1992–1993	NFHS-2 1998–1999	NFHS-3 2005–2006	NFHS-4 2015–2016	Diff. test[a]
1960–1964	0.5430***	.	.	.	
	(0.0007)	(.)	(.)	(.)	
	[2,744]	[.]	[.]	[.]	
1965–1969	0.5295***	0.5500***	.	.	A
	(0.0052)	(0.0004)	(.)	(.)	
	[5,551]	[2,011]	[.]	[.]	
1970–1974	0.5365***	0.5329***	0.5432*	.	
	(0.0000)	(0.0011)	(0.0851)	(.)	
	[7,898]	[5,543]	[521]	[.]	
1975–1979	0.5206*	0.5151	0.5257*	.	
	(0.0577)	(0.3126)	(0.0512)	(.)	
	[8,913]	[7,455]	[3,738]	[.]	
1980–1984	0.5213**	0.5240**	0.5271***	0.5567***	CEF
	(0.0272)	(0.0104)	(0.0048)	(0.0000)	
	[11,241]	[9,618]	[7,646]	[4,135]	
1985–1989	0.5180	0.5134	0.5121	0.5562***	CEF
	(0.1095)	(0.4060)	(0.5080)	(0.0000)	
	[11,293]	[10,912]	[9,345]	[22,243]	
1990–1994	0.5197	0.5193*	0.5176	0.5481***	CEF
	(0.1150)	(0.0643)	(0.1357)	(0.0000)	
	[6,523]	[11,457]	[10,475]	[41,624]	
1995–1999	.	0.5237**	0.4980	0.5322***	EF
	(.)	(0.0171)	(0.9986)	(0.0000)	
	[.]	[8,514]	[10,996]	[50,480]	
2000–2004	.	.	0.5123	0.5214***	F
	(.)	(.)	(0.4924)	(0.0000)	
	[.]	[.]	[10,743]	[56,853]	
2005–2009	.	.	0.5171	0.5182***	
	(.)	(.)	(0.3160)	(0.0017)	
	[.]	[.]	[2,537]	[59,383]	
2010–2016	.	.	.	0.5197***	
	(.)	(.)	(.)	(0.0000)	
	[.]	[.]	[.]	[73,474]	

Note. Sample consists of Hindu women only. First number in cell is ratio of boys to children. Second number, in parentheses, is p-value for the hypothesis that observed sex ratio is greater than 105/205 using a binomial probability test (bitest in Stata 13) with significance levels: * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Third number, in square brackets, is number of observations.

[a] Test (prtest in Stata 13) whether recall error increases with time passed, which would manifest itself in a higher sex ratio for a more recent survey than an earlier for the same cohort. A: Cohort sex ratio significantly larger in NFHS-2 than NFHS-1 at the 10% level. B: Cohort sex ratio significantly larger in NFHS-3 than NFHS-1 at the 10% level. C: Cohort sex ratio significantly larger in NFHS-4 than NFHS-1 at the 10% level. D: Cohort sex ratio significantly larger in NFHS-3 than NFHS-2 at the 10% level. E: Cohort sex ratio significantly larger in NFHS-4 than NFHS-2 at the 10% level. F: Cohort sex ratio significantly larger in NFHS-4 than NFHS-3 at the 10% level.

statistically significantly different from the natural sex ratio. The same general pattern holds for the other three surveys, with cohorts further away from the survey date more likely to have a sex ratio skewed male.

Finally, across surveys, the same cohort tends to show a higher sex ratio the more recent the survey (births in the cohort took place earlier relative to the survey date). Despite this, few cohorts show significantly different sex ratios across surveys, most likely because of a lack of power. The exception is that comparisons involving NFHS-4 are mostly statistically significant since the number of surveyed households in NFHS-4 were much larger than in prior surveys.

The problem with the above approach is that the year of birth is affected by recall error; a second born child listed as first-born is born later than the real first born child. Year of marriage should, however, be affected neither by parental recall error nor the use of sex-selective abortions. Tables C.2 and C.3, therefore, shows sex ratios of children recorded as first-born and second-born by year of parents' marriage, together with tests for whether the observed sex ratio is significantly higher than the natural sex ratio and whether more recent surveys show a higher sex ratio for the cohort than earlier surveys. The basic recall error pattern remains, with women married longer ago more likely to report that their first-born is a boy. Similarly, comparing women married in the same five-year period across surveys shows that women married longer ago are more likely to report having a son.

The relationship between the length of marriage and recall error can also be seen in Figures C.1 and C.2, which show the observed sex ratio for children reported as first born as a function of the duration of marriage at the time of the survey. The solid line is the sex ratio of children reported as first-born by the number of years between the survey and marriage, while the dashed lines indicate the 95% confidence interval and the horizontal line the natural sex ratio (approximately 0.512). To ensure sufficient cell sizes I group years into twos. In line with the results from Tables C.2 and C.3, the observed ratio of boys is increasingly above the expected value the longer ago the parents were married.

The increasingly unequal sex ratio with increasing marriage duration suggests that a solution to the recall error problem is to drop observations for women who were married "too far" from the survey year. The main problem is establishing what the best cut-off point should be, with the trade-off between retaining enough observations and the correctness of the information. As Tables C.2 and C.3 show, there are differences in recall error across the three surveys and between the two birth orders, although this may be the result of differences in the number of observations across surveys. Furthermore, the recall error pattern is not entirely consistent across observed birth orders. Since most of the surveys start showing significantly biased sex ratio from around 22 years of marriage on, I drop all observations where the marriage took place 22 years or more.

Table C.2: Observed Ratio of Boys for Children Listed as First-born by Year of Parents' Marriage in Five-Year Cohorts

	NFHS-1 1992–1993	NFHS-2 1998–1999	NFHS-3 2005–2006	NFHS-4 2015–2016	Diff. test[a]
1960–1964	0.5364***	.	.	.	
	(0.0001)	(.)	(.)	(.)	
	[6,298]	[.]	[.]	[.]	
1965–1969	0.5357***	0.5431***	.	.	
	(0.0001)	(0.0000)	(.)	(.)	
	[6,801]	[4,279]	[.]	[.]	
1970–1974	0.5242**	0.5223*	0.5269	.	
	(0.0150)	(0.0526)	(0.1010)	(.)	
	[8,274]	[6,527]	[1,953]	[.]	
1975–1979	0.5269***	0.5203*	0.5314***	0.5617***	CDEF
	(0.0017)	(0.0666)	(0.0019)	(0.0005)	
	[9,956]	[8,602]	[5,749]	[1,127]	
1980–1984	0.5152	0.5133	0.5192	0.5512***	CEF
	(0.2658)	(0.4166)	(0.1023)	(0.0000)	
	[10,894]	[9,805]	[8,237]	[12,033]	
1985–1989	0.5176	0.5210**	0.5094	0.5530***	CEF
	(0.1409)	(0.0339)	(0.7148)	(0.0000)	
	[10,017]	[10,825]	[9,620]	[33,241]	
1990–1994	0.5237	0.5196*	0.5119	0.5405***	CEF
	(0.1460)	(0.0663)	(0.5315)	(0.0000)	
	[2,198]	[10,464]	[10,458]	[45,940]	
1995–1999	.	0.5257**	0.5019	0.5254***	F
	(.)	(0.0292)	(0.9846)	(0.0000)	
	[.]	[5,007]	[10,863]	[52,679]	
2000–2004	.	.	0.5166	0.5207***	
	(.)	(.)	(0.2022)	(0.0000)	
	[.]	[.]	[9,119]	[56,143]	
2005–2009	.	.	.	0.5204***	
	(.)	(.)	(.)	(0.0000)	
	[.]	[.]	[.]	[58,511]	
2010–2016	.	.	.	0.5176***	
	(.)	(.)	(.)	(0.0091)	
	[.]	[.]	[.]	[48,481]	

Note. Sample consists of Hindu women only. First number in cell is ratio of boys to children. Second number, in parentheses, is p-value for the hypothesis that observed sex ratio is greater than 105/205 using a binomial probability test (bitest in Stata 13) with significance levels: * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Third number, in square brackets, is number of observations.

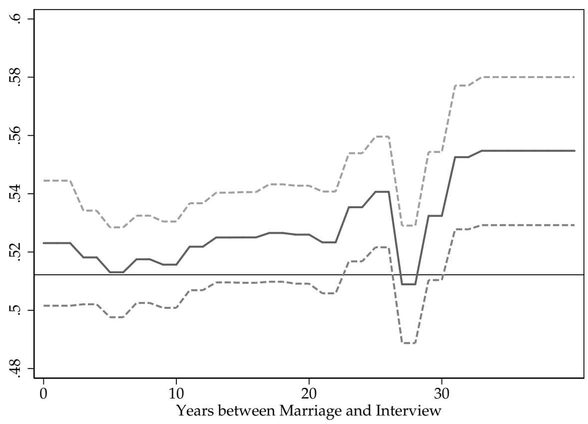
[a] Test (prtest in Stata 13) whether recall error increases with time passed, which would manifest itself in a higher sex ratio for a more recent survey than an earlier for the same cohort. A: Cohort sex ratio significantly larger in NFHS-2 than NFHS-1 at the 10% level. B: Cohort sex ratio significantly larger in NFHS-3 than NFHS-1 at the 10% level. C: Cohort sex ratio significantly larger in NFHS-4 than NFHS-1 at the 10% level. D: Cohort sex ratio significantly larger in NFHS-3 than NFHS-2 at the 10% level. E: Cohort sex ratio significantly larger in NFHS-4 than NFHS-2 at the 10% level. F: Cohort sex ratio significantly larger in NFHS-4 than NFHS-3 at the 10% level.

Table C.3: Observed Ratio of Boys for Children Listed as Second-born by Year of Parents' Marriage' in Five-Year Cohorts

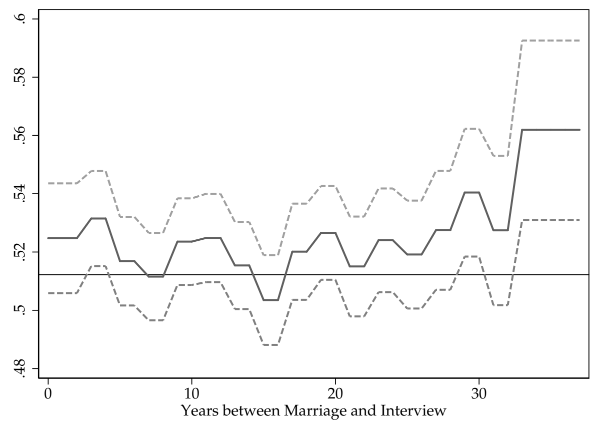
	NFHS-1 1992–1993	NFHS-2 1998–1999	NFHS-3 2005–2006	NFHS-4 2015–2016	Diff. test[a]
1960–1964	0.5264**	.	.	.	
	(0.0135)	(.)	(.)	(.)	
	[6,113]	[.]	[.]	[.]	
1965–1969	0.5269***	0.5378***	.	.	
	(0.0090)	(0.0005)	(.)	(.)	
	[6,571]	[4,163]	[.]	[.]	
1970–1974	0.5192	0.5220*	0.5374**	.	B
	(0.1085)	(0.0619)	(0.0148)	(.)	
	[7,984]	[6,307]	[1,898]	[.]	
1975–1979	0.5147	0.5198*	0.5287***	0.5453**	BCE
	(0.3143)	(0.0850)	(0.0072)	(0.0172)	
	[9,469]	[8,288]	[5,582]	[1,049]	
1980–1984	0.5213**	0.5173	0.5170	0.5346***	CEF
	(0.0348)	(0.1650)	(0.1984)	(0.0000)	
	[9,932]	[9,343]	[7,866]	[11,513]	
1985–1989	0.5133	0.5178	0.5251***	0.5301***	BCE
	(0.4376)	(0.1312)	(0.0074)	(0.0000)	
	[5,901]	[10,036]	[9,035]	[31,639]	
1990–1994	0.4362	0.5197*	0.5256***	0.5274***	ABC
	(0.9737)	(0.0926)	(0.0045)	(0.0000)	
	[149]	[7,918]	[9,555]	[43,344]	
1995–1999	.	0.5630***	0.5312***	0.5230***	
	(.)	(0.0007)	(0.0002)	(0.0000)	
	[.]	[1,016]	[8,940]	[49,053]	
2000–2004	.	.	0.5252*	0.5199***	
	(.)	(.)	(0.0688)	(0.0003)	
	[.]	[.]	[3,307]	[50,804]	
2005–2009	.	.	.	0.5231***	
	(.)	(.)	(.)	(0.0000)	
	[.]	[.]	[.]	[46,164]	
2010–2016	.	.	.	0.5218**	
	(.)	(.)	(.)	(0.0110)	
	[.]	[.]	[.]	[14,370]	

Note. Sample consists of Hindu women only. First number in cell is ratio of boys to children. Second number, in parentheses, is p-value for the hypothesis that observed sex ratio is greater than 105/205 using a binomial probability test (bitest in Stata 13) with significance levels: * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Third number, in square brackets, is number of observations.

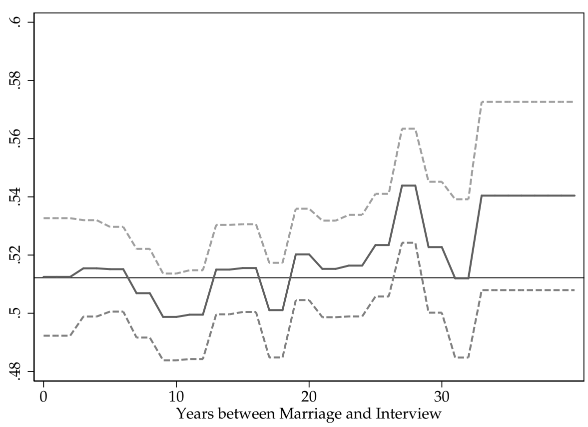
[a] Test (prtest in Stata 13) whether recall error increases with time passed, which would manifest itself in a higher sex ratio for a more recent survey than an earlier for the same cohort. A: Cohort sex ratio significantly larger in NFHS-2 than NFHS-1 at the 10% level. B: Cohort sex ratio significantly larger in NFHS-3 than NFHS-1 at the 10% level. C: Cohort sex ratio significantly larger in NFHS-4 than NFHS-1 at the 10% level. D: Cohort sex ratio significantly larger in NFHS-3 than NFHS-2 at the 10% level. E: Cohort sex ratio significantly larger in NFHS-4 than NFHS-2 at the 10% level. F: Cohort sex ratio significantly larger in NFHS-4 than NFHS-3 at the 10% level.



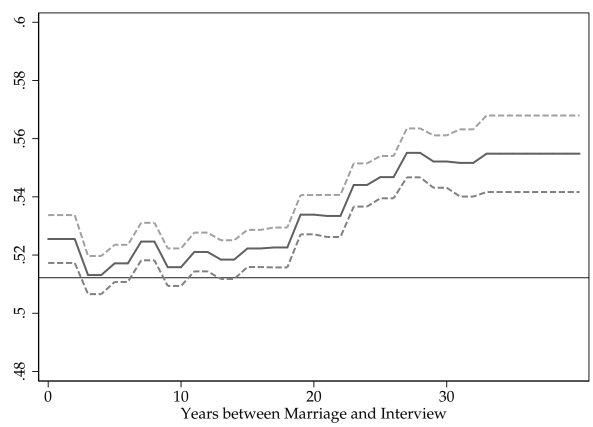
(a) NFHS-1



(b) NFHS-2

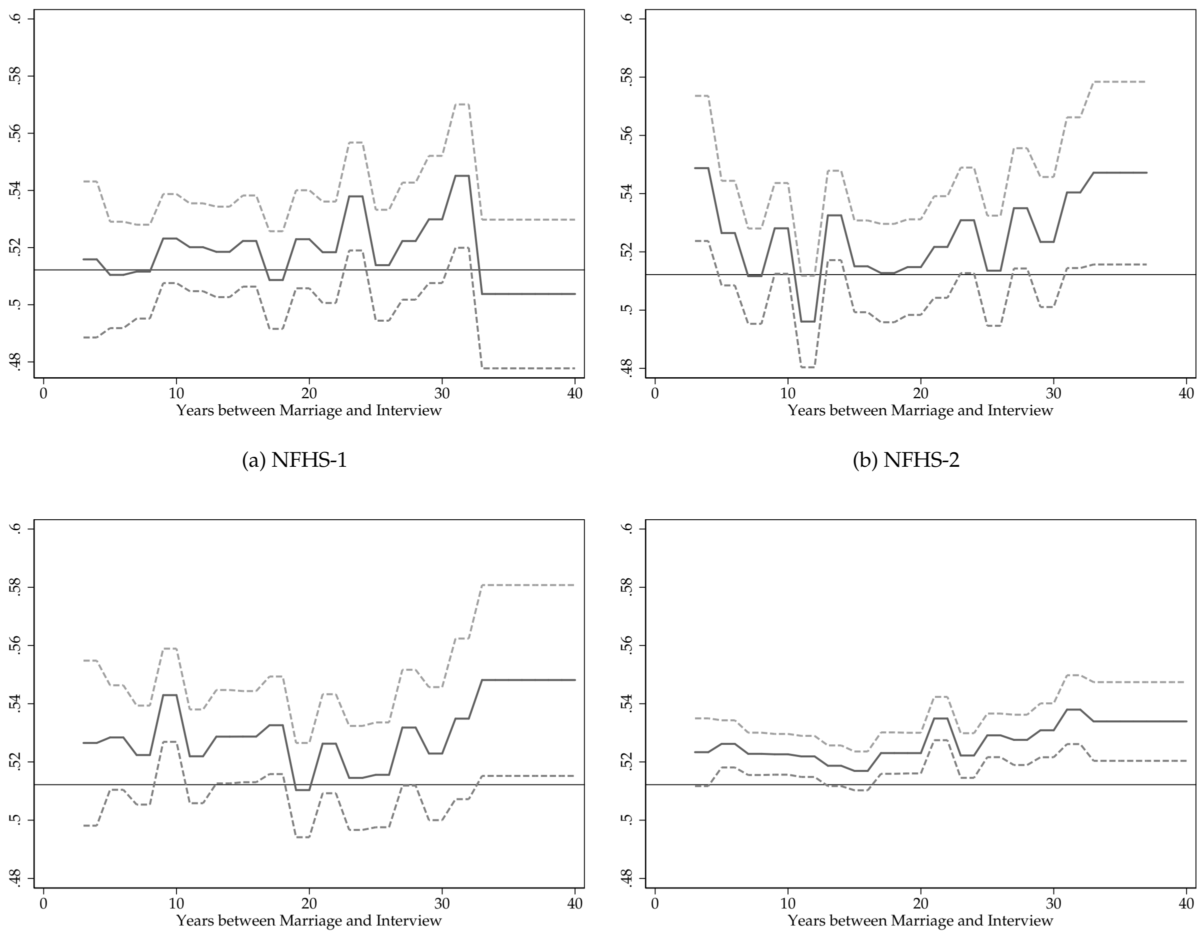


(c) NFHS-3



(d) NFHS-4

Figure C.1: Ratio of Boys for “First” Births by Survey Round



(a) NFHS-1

(b) NFHS-2

(c) NFHS-3

(d) NFHS-4

Figure C.2: Ratio of Boys for “Second” Births by Survey Round

D Descriptive Statistics

Table D.1: Descriptive Statistics by Education Level and Beginning of Spell For Two Lowest Education Levels

		No Education				1–7 Years of Education			
		1972–1984	1985–1994	1995–2004	2005–2016	1972–1984	1985–1994	1995–2004	2005–2016
Second Spell	Boy born	0.504	0.452	0.468	0.413	0.493	0.450	0.460	0.380
		(0.500)	(0.498)	(0.499)	(0.492)	(0.500)	(0.498)	(0.498)	(0.485)
	Girl born	0.464	0.421	0.440	0.380	0.474	0.423	0.426	0.353
		(0.499)	(0.494)	(0.496)	(0.485)	(0.499)	(0.494)	(0.494)	(0.478)
	Censored	0.032	0.127	0.092	0.207	0.032	0.127	0.114	0.266
		(0.175)	(0.333)	(0.289)	(0.405)	(0.177)	(0.333)	(0.317)	(0.442)
	1 boy	0.523	0.515	0.518	0.516	0.521	0.514	0.522	0.519
		(0.499)	(0.500)	(0.500)	(0.500)	(0.500)	(0.500)	(0.500)	(0.500)
	1 girl	0.477	0.485	0.482	0.484	0.479	0.486	0.478	0.481
		(0.499)	(0.500)	(0.500)	(0.500)	(0.500)	(0.500)	(0.500)	(0.500)
	Urban	0.169	0.175	0.155	0.122	0.350	0.341	0.259	0.192
		(0.375)	(0.380)	(0.362)	(0.327)	(0.477)	(0.474)	(0.438)	(0.394)
	Age	17.773	18.274	19.432	20.740	18.637	19.141	19.485	20.527
		(2.739)	(3.005)	(3.410)	(3.520)	(2.889)	(3.176)	(3.284)	(3.271)
	Owns land	0.602	0.573	0.510	0.482	0.506	0.493	0.474	0.468
		(0.509)	(0.503)	(0.500)	(0.500)	(0.500)	(0.500)	(0.499)	(0.499)
	Sched. caste/tribe	0.347	0.391	0.444	0.486	0.154	0.219	0.337	0.416
		(0.476)	(0.488)	(0.497)	(0.500)	(0.361)	(0.414)	(0.473)	(0.493)
	3 months periods	163,580	232,552	392,924	244,364	59,182	106,165	255,925	229,242
	Women	18,650	27,563	43,952	29,527	6,889	12,191	27,225	26,446
Third Spell	Boy born	0.492	0.428	0.421	0.341	0.464	0.397	0.356	0.273
		(0.500)	(0.495)	(0.494)	(0.474)	(0.499)	(0.489)	(0.479)	(0.445)
	Girl born	0.455	0.398	0.386	0.314	0.437	0.360	0.325	0.236
		(0.498)	(0.489)	(0.487)	(0.464)	(0.496)	(0.480)	(0.469)	(0.424)
	Censored	0.053	0.174	0.193	0.345	0.100	0.243	0.319	0.492
		(0.224)	(0.379)	(0.395)	(0.475)	(0.300)	(0.429)	(0.466)	(0.500)
	2 boys	0.275	0.256	0.251	0.249	0.251	0.246	0.241	0.239
		(0.447)	(0.436)	(0.434)	(0.432)	(0.434)	(0.431)	(0.427)	(0.426)
	1 boy, 1 girl	0.489	0.502	0.504	0.499	0.506	0.502	0.509	0.505
		(0.500)	(0.500)	(0.500)	(0.500)	(0.500)	(0.500)	(0.500)	(0.500)
	2 girls	0.235	0.243	0.245	0.252	0.243	0.252	0.251	0.256
		(0.424)	(0.429)	(0.430)	(0.434)	(0.429)	(0.434)	(0.434)	(0.436)
	Urban	0.173	0.171	0.159	0.121	0.365	0.341	0.263	0.192
		(0.379)	(0.376)	(0.365)	(0.326)	(0.482)	(0.474)	(0.440)	(0.394)
	Age	19.987	20.593	21.641	23.055	20.839	21.367	21.735	22.821
		(2.896)	(3.150)	(3.490)	(3.665)	(2.954)	(3.228)	(3.372)	(3.441)
	Owns land	0.607	0.581	0.523	0.489	0.507	0.509	0.493	0.475
		(0.506)	(0.497)	(0.499)	(0.500)	(0.500)	(0.500)	(0.500)	(0.499)
	Sched. caste/tribe	0.339	0.392	0.444	0.479	0.154	0.218	0.334	0.410
		(0.473)	(0.488)	(0.497)	(0.500)	(0.361)	(0.413)	(0.472)	(0.492)
	3 months periods	105,997	194,166	295,808	267,436	42,088	84,124	182,266	209,481
	Women	12,119	22,858	31,218	29,446	4,384	8,785	16,346	20,850
Fourth Spell	Boy born	0.483	0.390	0.357	0.286	0.414	0.358	0.293	0.222
		(0.500)	(0.488)	(0.479)	(0.452)	(0.493)	(0.479)	(0.455)	(0.416)
	Girl born	0.424	0.367	0.327	0.266	0.405	0.305	0.254	0.199
		(0.494)	(0.482)	(0.469)	(0.442)	(0.491)	(0.461)	(0.435)	(0.400)
	Censored	0.093	0.243	0.316	0.448	0.180	0.337	0.453	0.578
		(0.290)	(0.429)	(0.465)	(0.497)	(0.385)	(0.473)	(0.498)	(0.494)
	3 boys	0.136	0.123	0.115	0.105	0.110	0.107	0.099	0.087
		(0.343)	(0.329)	(0.319)	(0.307)	(0.312)	(0.310)	(0.299)	(0.281)
	2 boys, 1 girl	0.372	0.355	0.352	0.335	0.343	0.329	0.327	0.314
		(0.483)	(0.478)	(0.478)	(0.472)	(0.475)	(0.470)	(0.469)	(0.464)
	1 boys, 2 girls	0.362	0.392	0.397	0.407	0.400	0.407	0.413	0.423
		(0.481)	(0.488)	(0.489)	(0.491)	(0.490)	(0.491)	(0.492)	(0.494)
	3 girls	0.130	0.130	0.137	0.153	0.147	0.157	0.162	0.176
		(0.337)	(0.336)	(0.343)	(0.360)	(0.354)	(0.363)	(0.368)	(0.381)
	Urban	0.168	0.168	0.159	0.114	0.358	0.330	0.258	0.189
		(0.374)	(0.374)	(0.365)	(0.318)	(0.479)	(0.470)	(0.438)	(0.392)
	Age	21.948	22.777	23.583	25.284	22.644	23.444	23.821	24.893
		(3.019)	(3.296)	(3.497)	(3.799)	(2.910)	(3.385)	(3.455)	(3.523)
	Owns land	0.615	0.594	0.542	0.497	0.522	0.537	0.508	0.480
		(0.509)	(0.496)	(0.498)	(0.500)	(0.500)	(0.499)	(0.500)	(0.500)
	Sched. caste/tribe	0.333	0.402	0.451	0.481	0.148	0.219	0.339	0.414
		(0.471)	(0.490)	(0.498)	(0.500)	(0.355)	(0.413)	(0.473)	(0.493)
	3 months periods	55,942	140,909	162,841	217,023	20,121	46,646	75,858	110,944
	Women	6,421	16,278	17,105	22,496	2,008	4,771	6,496	10,620

Note. Means without parentheses and standard deviation in parentheses. Interactions between variables and baseline hazard dummies not shown.

Table D.2: Descriptive Statistics by Education Level and Beginning of Spell for Two Highest Education Levels

		8–11 Years of Education				12+ Years of Education			
		1972–1984	1985–1994	1995–2004	2005–2016	1972–1984	1985–1994	1995–2004	2005–2016
Second Spell	Boy born	0.486	0.432	0.441	0.325	0.452	0.392	0.400	0.268
		(0.500)	(0.495)	(0.497)	(0.468)	(0.498)	(0.488)	(0.490)	(0.443)
	Girl born	0.458	0.392	0.395	0.300	0.438	0.328	0.336	0.229
		(0.498)	(0.488)	(0.489)	(0.458)	(0.496)	(0.469)	(0.472)	(0.421)
	Censored	0.056	0.175	0.164	0.375	0.110	0.280	0.265	0.503
		(0.231)	(0.380)	(0.370)	(0.484)	(0.313)	(0.449)	(0.441)	(0.500)
	1 boy	0.521	0.520	0.521	0.518	0.512	0.519	0.526	0.519
		(0.500)	(0.500)	(0.500)	(0.500)	(0.500)	(0.500)	(0.499)	(0.500)
	1 girl	0.479	0.480	0.479	0.482	0.488	0.481	0.474	0.481
		(0.500)	(0.500)	(0.500)	(0.500)	(0.500)	(0.500)	(0.499)	(0.500)
	Urban	0.608	0.524	0.385	0.266	0.865	0.811	0.659	0.469
		(0.488)	(0.499)	(0.487)	(0.442)	(0.342)	(0.391)	(0.474)	(0.499)
	Age	20.340	20.630	20.528	21.117	22.803	23.312	23.099	23.170
		(3.203)	(3.318)	(3.405)	(3.349)	(3.330)	(3.499)	(3.712)	(3.704)
	Owns land	0.364	0.426	0.456	0.495	0.217	0.264	0.349	0.453
		(0.481)	(0.495)	(0.498)	(0.500)	(0.413)	(0.441)	(0.477)	(0.498)
	Sched. caste/tribe	0.076	0.138	0.231	0.309	0.030	0.065	0.124	0.195
		(0.266)	(0.345)	(0.422)	(0.462)	(0.172)	(0.246)	(0.330)	(0.396)
	3 months periods	45,828	106,296	334,766	372,999	25,305	71,602	230,155	297,850
	Women	4,850	10,823	31,512	40,204	2,034	5,605	17,314	28,198
Third Spell	Boy born	0.410	0.309	0.299	0.196	0.267	0.188	0.181	0.120
		(0.492)	(0.462)	(0.458)	(0.397)	(0.443)	(0.391)	(0.385)	(0.325)
	Girl born	0.366	0.261	0.244	0.163	0.233	0.137	0.139	0.078
		(0.482)	(0.439)	(0.429)	(0.370)	(0.423)	(0.344)	(0.346)	(0.268)
	Censored	0.224	0.430	0.457	0.640	0.499	0.674	0.680	0.802
		(0.417)	(0.495)	(0.498)	(0.480)	(0.500)	(0.469)	(0.467)	(0.398)
	2 boys	0.267	0.247	0.240	0.227	0.279	0.237	0.246	0.225
		(0.443)	(0.431)	(0.427)	(0.419)	(0.449)	(0.425)	(0.431)	(0.418)
	1 boy, 1 girl	0.482	0.508	0.517	0.513	0.495	0.515	0.535	0.538
		(0.500)	(0.500)	(0.500)	(0.500)	(0.500)	(0.500)	(0.499)	(0.499)
	2 girls	0.251	0.245	0.242	0.260	0.226	0.248	0.219	0.237
		(0.433)	(0.430)	(0.429)	(0.439)	(0.419)	(0.432)	(0.414)	(0.425)
	Urban	0.623	0.547	0.385	0.277	0.877	0.827	0.652	0.484
		(0.485)	(0.498)	(0.487)	(0.447)	(0.329)	(0.378)	(0.476)	(0.500)
	Age	22.322	22.882	22.751	23.537	25.085	25.810	25.524	25.963
		(3.126)	(3.390)	(3.429)	(3.577)	(3.463)	(3.743)	(3.945)	(4.116)
	Owns land	0.361	0.426	0.482	0.500	0.215	0.268	0.371	0.461
		(0.480)	(0.495)	(0.500)	(0.500)	(0.411)	(0.443)	(0.483)	(0.499)
	Sched. caste/tribe	0.074	0.132	0.234	0.291	0.034	0.058	0.127	0.186
		(0.262)	(0.339)	(0.423)	(0.454)	(0.181)	(0.234)	(0.333)	(0.389)
	3 months periods	36,611	81,074	222,974	296,060	18,805	51,144	134,925	185,578
	Women	2,897	6,637	16,314	25,328	973	2,995	7,494	13,774
Fourth Spell	Boy born	0.344	0.259	0.252	0.170	0.226	0.164	0.172	0.105
		(0.475)	(0.438)	(0.434)	(0.375)	(0.419)	(0.371)	(0.378)	(0.307)
	Girl born	0.319	0.224	0.190	0.132	0.246	0.129	0.127	0.077
		(0.466)	(0.417)	(0.392)	(0.338)	(0.432)	(0.335)	(0.333)	(0.266)
	Censored	0.337	0.517	0.558	0.699	0.528	0.707	0.701	0.818
		(0.473)	(0.500)	(0.497)	(0.459)	(0.500)	(0.455)	(0.458)	(0.386)
	3 boys	0.109	0.104	0.092	0.076	0.101	0.086	0.069	0.063
		(0.312)	(0.305)	(0.289)	(0.264)	(0.301)	(0.281)	(0.254)	(0.243)
	2 boys, 1 girl	0.363	0.305	0.317	0.291	0.337	0.314	0.331	0.282
		(0.481)	(0.461)	(0.465)	(0.454)	(0.474)	(0.464)	(0.471)	(0.450)
	1 boys, 2 girls	0.385	0.438	0.439	0.449	0.427	0.430	0.450	0.494
		(0.487)	(0.496)	(0.496)	(0.497)	(0.496)	(0.495)	(0.498)	(0.500)
	3 girls	0.142	0.152	0.153	0.185	0.136	0.170	0.151	0.162
		(0.349)	(0.360)	(0.360)	(0.388)	(0.343)	(0.376)	(0.358)	(0.369)
	Urban	0.639	0.534	0.359	0.253	0.824	0.769	0.574	0.395
		(0.481)	(0.499)	(0.480)	(0.434)	(0.382)	(0.421)	(0.495)	(0.489)
	Age	23.962	24.856	24.546	25.475	25.950	27.494	26.888	27.638
		(3.026)	(3.456)	(3.486)	(3.618)	(3.434)	(3.899)	(4.228)	(4.347)
	Owns land	0.353	0.444	0.502	0.523	0.271	0.338	0.455	0.506
		(0.478)	(0.497)	(0.500)	(0.499)	(0.446)	(0.473)	(0.498)	(0.500)
	Sched. caste/tribe	0.089	0.127	0.244	0.310	0.045	0.054	0.165	0.201
		(0.285)	(0.333)	(0.430)	(0.463)	(0.208)	(0.226)	(0.371)	(0.401)
	3 months periods	13,964	32,921	67,194	107,345	3,347	11,076	22,292	38,203
	Women	1,043	2,656	4,852	9,116	199	707	1,288	2,770

Note. Means without parentheses and standard deviation in parentheses. Interactions between variables and baseline hazard dummies not shown.

E Additional Results Figures and Tables

Figures E.1 and E.2 show 25th, 50th, and 75th percentile birth interval lengths, the sex ratio, and the probability of parity progression by spell for urban women with no education and rural women with 12 or more years of education, respectively.

The first set of tables, Tables E.1, E.2, E.3, and E.4 show 25th, 50th, and 75th percentile birth interval lengths together with their standard errors. The standard errors for all measures are based on bootstrapping, where the model is repeatedly estimated using resampling with replacement.

The second set of tables, Tables E.5, E.6, E.7, and E.8, show predicted average birth interval lengths, sex ratios, and probabilities of having a birth by decade, spell, and sex composition for the four education levels separated by the area of residence, together with bootstrapped standard errors for all three outcomes. To find the average birth interval length, I calculate, for each woman, the probability of giving birth in each t, and her expected spell length from these probabilities. I then average the individual expected spell lengths across women using their parity progression probabilities as weights. Finally, I add nine months because spells begin nine months after the previous birth.

I also show whether durations for sex composition other than only girls are statistically significantly different from the duration with only girls based on bootstrapped differences. The cleanest test is comparing durations after only boys with durations after only girls, but the number of births to women with only sons becomes small in the later periods. Hence, it is possible to have substantial differences in spacing that are not statistically significant because of low power, especially for the third and fourth spell.

Each predicted percent of boys is tested against the natural percentage of boys using the bootstrapped standard errors. The natural sex ratio is approximately 105 boys to 100 girls or 51.2% (Jacobsen et al., 1999; Pörtner, 2015). The predicted percentage boys may differ from the natural rate because of natural variation, any remaining recall error not corrected for, or sex selection.

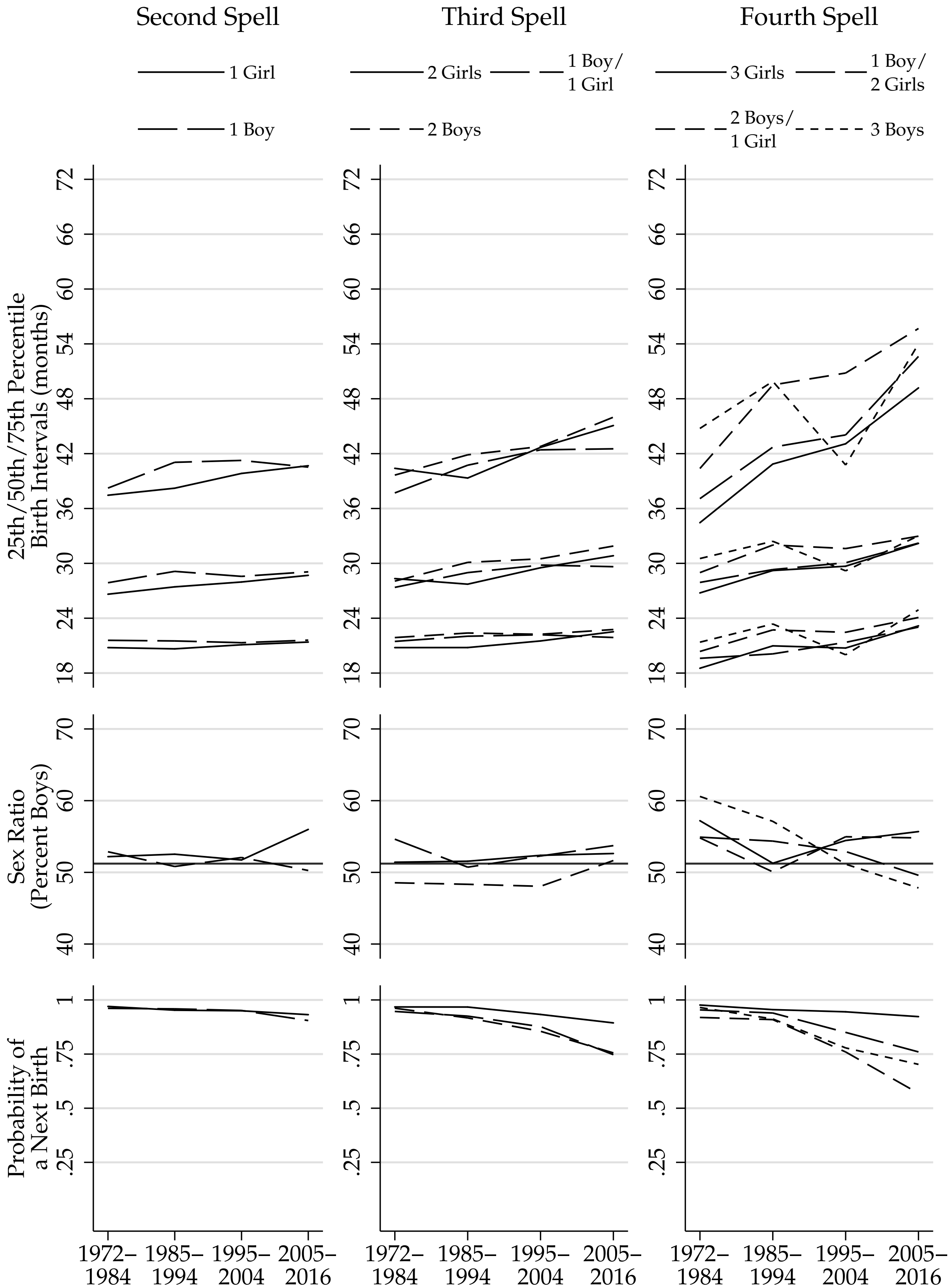


Figure E.1: Percentile birth interval lengths, sex ratios, and parity progression for urban women with no education by spell, sex composition, and period

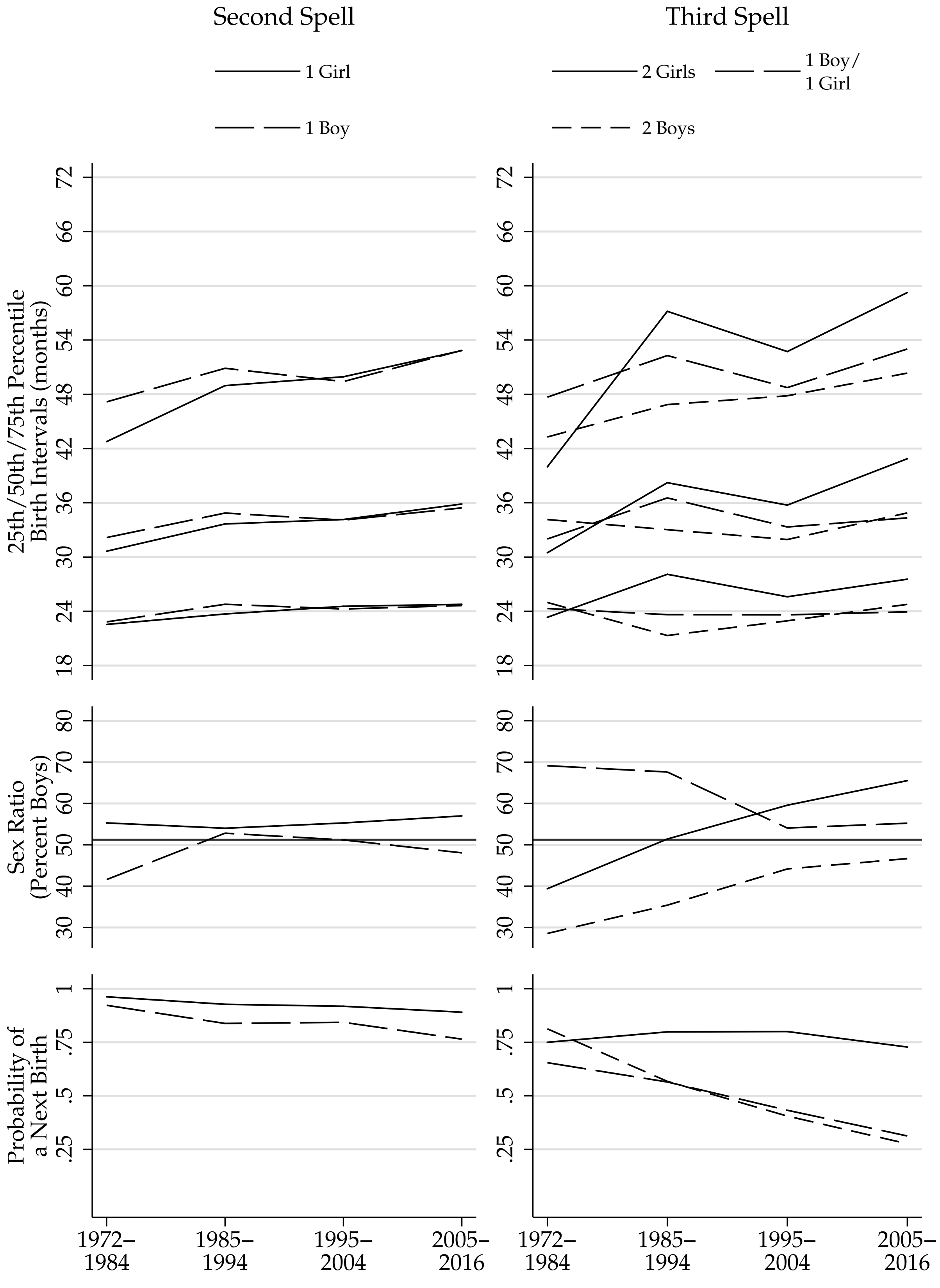


Figure E.2: Percentile birth interval lengths, sex ratios, and parity progression for rural women with 12 or more years of education by spell, sex composition, and period

Table E.1: Estimated 25th, 50th, and 75th Percentile Birth Interval Lengths for Women with No Education

		1972–1984			1985–1994			1995–2004			2005–2016		
		Interval (Months)[a] Percentile			Interval (Months)[a] Percentile			Interval (Months)[a] Percentile			Interval (Months)[a] Percentile		
Spell	Composition of Prior Children	25th	50th	75th	25th	50th	75th	25th	50th	75th	25th	50th	75th
							Urban						
2	1 girl	20.8	26.6	37.5	20.7	27.4	38.2	21.1	28.0	39.8	21.4	28.7	40.7
		(0.4)	(0.3)	(0.6)	(0.3)	(0.4)	(0.5)	(0.2)	(0.3)	(0.5)	(0.4)	(0.5)	(0.8)
	1 boy	21.6*	27.9***	38.2	21.5**	29.1***	41.1***	21.3	28.6	41.3**	21.6	29.1	40.5
		(0.3)	(0.4)	(0.5)	(0.3)	(0.4)	(0.7)	(0.2)	(0.3)	(0.5)	(0.3)	(0.5)	(0.8)
3	2 girls	20.8	28.3	40.4	20.8	27.7	39.3	21.5	29.5	42.7	22.5	30.8	45.1
		(0.6)	(0.7)	(1.0)	(0.5)	(0.6)	(1.0)	(0.3)	(0.5)	(0.8)	(0.4)	(0.7)	(1.5)
	1 boy, 1 girl	21.5	27.4	37.7*	22.0**	29.0*	40.7	22.2*	29.8	42.4	21.9	29.6	42.5
		(0.3)	(0.4)	(0.9)	(0.2)	(0.4)	(0.6)	(0.2)	(0.3)	(0.7)	(0.4)	(0.5)	(1.2)
	2 boys	21.9	28.1	39.7	22.4***	30.1**	41.9*	22.2	30.5	42.8	22.8	31.9	46.0
		(0.4)	(0.6)	(1.1)	(0.4)	(0.7)	(0.9)	(0.3)	(0.6)	(0.8)	(0.5)	(0.8)	(1.6)
4	3 girls	18.5	26.8	34.4	21.0	29.2	40.9	20.7	29.7	43.1	23.2	32.2	49.2
		(1.2)	(0.8)	(1.7)	(0.9)	(0.6)	(1.7)	(1.1)	(0.8)	(2.1)	(1.0)	(1.0)	(2.1)
	1 boy, 2 girls	19.6	27.9	37.1	20.1	29.3	42.7	21.4	30.1	44.1	23.0	32.2	52.6
		(0.9)	(0.6)	(1.3)	(0.6)	(0.5)	(1.4)	(0.7)	(0.5)	(2.2)	(0.8)	(0.7)	(2.4)
	2 boys, 1 girl	20.4	29.0**	40.4**	22.7	32.0***	49.5***	22.5	31.6*	50.8**	24.1	33.0	55.7
		(1.1)	(0.7)	(2.0)	(0.7)	(0.6)	(1.3)	(0.9)	(0.6)	(2.4)	(0.9)	(0.9)	(3.5)
	3 boys	21.4	30.5**	44.8***	23.4*	32.4***	49.9***	20.0	29.2	40.8	24.9	33.0	54.0
		(1.8)	(1.5)	(2.9)	(0.9)	(1.0)	(2.1)	(1.3)	(1.0)	(3.5)	(1.3)	(1.5)	(5.8)
							Rural						
2	1 girl	21.6	27.6	37.4	21.8	28.4	39.0	22.0	28.7	39.7	21.9	28.7	39.6
		(0.1)	(0.2)	(0.3)	(0.1)	(0.1)	(0.2)	(0.1)	(0.1)	(0.2)	(0.1)	(0.1)	(0.2)
	1 boy	22.0**	28.6***	38.6***	22.1**	29.1***	39.9***	22.0	28.8	40.3***	22.2*	29.1*	40.7***
		(0.1)	(0.2)	(0.2)	(0.1)	(0.2)	(0.2)	(0.1)	(0.1)	(0.2)	(0.1)	(0.2)	(0.3)
3	2 girls	20.9	26.8	36.7	22.0	29.0	40.0	22.2	29.0	40.6	22.3	29.5	41.3
		(0.3)	(0.3)	(0.5)	(0.2)	(0.3)	(0.4)	(0.1)	(0.2)	(0.3)	(0.1)	(0.2)	(0.3)
	1 boy, 1 girl	22.0***	28.1***	38.1**	21.9	28.9	40.2	22.2	29.1	41.2*	22.8***	30.3***	43.0***
		(0.1)	(0.2)	(0.3)	(0.1)	(0.2)	(0.3)	(0.1)	(0.1)	(0.2)	(0.1)	(0.2)	(0.3)
	2 boys	21.8***	28.2***	38.4***	22.3	29.9**	41.9***	22.7***	30.0***	42.0***	23.0***	31.4***	44.5***
		(0.2)	(0.3)	(0.4)	(0.1)	(0.3)	(0.4)	(0.1)	(0.2)	(0.3)	(0.2)	(0.3)	(0.5)
4	3 girls	18.9	27.4	36.4	20.4	29.1	40.7	20.3	28.9	40.2	22.6	30.8	44.6
		(0.7)	(0.4)	(0.8)	(0.4)	(0.3)	(0.7)	(0.4)	(0.3)	(0.7)	(0.4)	(0.2)	(0.6)
	1 boy, 2 girls	19.7	28.2*	38.4*	22.1***	30.3***	43.6***	21.6***	30.0***	43.2***	23.3	31.8***	49.2***
		(0.3)	(0.3)	(0.7)	(0.3)	(0.2)	(0.5)	(0.3)	(0.2)	(0.7)	(0.3)	(0.2)	(0.7)
	2 boys, 1 girl	20.2*	28.3*	37.8	22.2***	31.0***	46.3***	22.1***	31.1***	48.2***	25.0***	34.0***	57.5***
		(0.4)	(0.2)	(0.6)	(0.3)	(0.3)	(0.7)	(0.4)	(0.2)	(0.9)	(0.2)	(0.3)	(0.8)
	3 boys	19.6	28.6*	40.0**	23.1***	31.4***	46.9***	22.5***	31.4***	49.0***	24.5***	33.9***	56.7***
		(0.6)	(0.5)	(1.3)	(0.6)	(0.5)	(1.2)	(0.6)	(0.6)	(1.8)	(0.5)	(0.6)	(1.4)

Note. The statistics for each spell/period combination are calculated based on the hazard model for that combination as described in the main text, using bootstrapping to find the standard errors shown in parentheses. For bootstrapping, the original sample is resampled, the hazard model run on the resampled data, and the statistics calculated. This process is repeated 100 times and the standard errors calculated.

[a] Percentile birth interval lengths calculated as follows. For each woman in a given spell/period combination sample, I calculate the time point at which there is a given percent chance that she will have given birth, conditional on the probability that she will eventually give birth in that spell. For example, if there is an 80% chance that a woman will give birth by the end of the spell, her median birth interval is the predicted number of months before she passes the 60% mark on her survival curve plus nine months to account for spell start. The reported statistics is the average of a given percentile interval across all women in a given sample using the individual predicted probabilities of having had a birth by the end of the spell as weights. Birth intervals for sex compositions other than all girls are tested against the duration for all girls, with *** indicating significantly different at the 1% level, ** at the 5% level, and * at the 10% level.

Table E.2: Estimated 25th, 50th, and 75th Percentile Birth Interval Lengths for Women with 1–7 Years of Education

		1972–1984			1985–1994			1995–2004			2005–2016		
		Interval (Months)[a] Percentile			Interval (Months)[a] Percentile			Interval (Months)[a] Percentile			Interval (Months)[a] Percentile		
Spell	Composition of Prior Children	25th	50th	75th	25th	50th	75th	25th	50th	75th	25th	50th	75th
						Urban							
	1 girl	19.9	26.4	35.2	20.9	27.6	39.0	21.2	28.9	42.1	22.2	30.4	43.5
2		(0.4)	(0.3)	(0.6)	(0.3)	(0.4)	(0.6)	(0.2)	(0.3)	(0.5)	(0.3)	(0.4)	(0.8)
	1 boy	21.1**	27.3	37.6***	21.3	29.2***	40.2	21.9**	29.5	42.4	22.5	31.3*	46.3**
		(0.3)	(0.5)	(0.7)	(0.3)	(0.4)	(0.7)	(0.3)	(0.3)	(0.5)	(0.3)	(0.5)	(1.0)
	2 girls	20.2	26.6	36.8	22.0	29.7	42.7	22.7	31.9	47.0	24.1	33.1	49.5
		(0.7)	(0.7)	(1.2)	(0.4)	(0.7)	(1.3)	(0.4)	(0.7)	(1.4)	(0.4)	(0.7)	(1.6)
3	1 boy, 1 girl	22.1***	28.9***	39.8**	22.4	29.7	43.4	22.7	30.5	44.2	22.9**	31.1**	45.2**
		(0.3)	(0.5)	(0.9)	(0.3)	(0.5)	(1.1)	(0.2)	(0.5)	(0.9)	(0.4)	(0.6)	(1.3)
	2 boys	22.0**	28.3	39.0	22.7	30.4	45.0	23.0	31.1	45.1	23.6	32.8	48.5
		(0.5)	(0.8)	(1.2)	(0.4)	(0.8)	(1.4)	(0.4)	(0.8)	(1.3)	(0.6)	(1.1)	(1.8)
	3 girls	18.7	28.0	39.5	20.6	29.7	43.6	24.2	34.6	54.6	23.5	32.8	52.3
		(1.5)	(1.4)	(3.3)	(1.3)	(1.0)	(2.6)	(1.2)	(1.5)	(2.1)	(1.1)	(1.3)	(3.2)
	1 boy, 2 girls	20.0	28.5	38.2	21.7	31.2	49.5	20.8**	30.8**	49.6	22.5	31.2	47.5
4		(1.1)	(0.7)	(2.1)	(1.0)	(0.8)	(2.5)	(1.0)	(0.8)	(3.1)	(1.1)	(0.7)	(3.8)
	2 boys, 1 girl	20.7	29.3	41.2	23.3	33.0**	55.1***	22.8	31.8	51.3	26.4**	35.9	63.8**
		(1.3)	(0.9)	(3.5)	(1.0)	(1.1)	(2.9)	(1.1)	(0.9)	(3.8)	(0.9)	(1.8)	(3.6)
	3 boys	20.0	29.5	42.7	23.4	31.9	49.5	23.1	31.5	49.1	25.3	37.3	65.8**
		(2.4)	(2.5)	(7.7)	(1.4)	(1.3)	(3.9)	(1.8)	(1.6)	(6.1)	(2.3)	(4.5)	(5.4)
						Rural							
	1 girl	21.4	27.0	37.0	21.3	28.1	39.2	22.1	29.1	40.7	22.3	29.5	41.6
2		(0.2)	(0.3)	(0.5)	(0.2)	(0.3)	(0.4)	(0.1)	(0.2)	(0.3)	(0.1)	(0.2)	(0.4)
	1 boy	22.2***	28.6***	39.0***	22.0***	28.8*	39.8	22.2	29.5	41.3	22.7**	30.3**	43.4***
		(0.2)	(0.3)	(0.4)	(0.2)	(0.3)	(0.4)	(0.1)	(0.2)	(0.3)	(0.1)	(0.2)	(0.4)
	2 girls	20.9	27.0	36.3	21.3	28.3	38.1	22.6	30.3	42.6	23.3	31.4	44.9
		(0.5)	(0.4)	(0.7)	(0.3)	(0.4)	(0.6)	(0.2)	(0.3)	(0.5)	(0.2)	(0.3)	(0.6)
3	1 boy, 1 girl	22.0**	28.4**	38.9***	22.4***	29.9***	42.2***	22.7	30.2	42.7	23.4	31.5	45.5
		(0.2)	(0.4)	(0.7)	(0.2)	(0.3)	(0.5)	(0.1)	(0.2)	(0.4)	(0.1)	(0.3)	(0.6)
	2 boys	22.8***	30.3***	41.5***	22.8***	30.2**	43.0***	22.7	30.5	43.8	23.6	32.3	46.5
		(0.4)	(0.6)	(1.0)	(0.3)	(0.6)	(1.0)	(0.2)	(0.4)	(0.7)	(0.2)	(0.5)	(0.9)
	3 girls	21.0	28.2	36.9	22.3	30.3	43.0	23.5	32.2	47.6	25.0	33.3	50.4
		(1.3)	(0.7)	(1.6)	(0.7)	(0.6)	(1.5)	(0.6)	(0.6)	(1.2)	(0.4)	(0.4)	(1.0)
	1 boy, 2 girls	21.3	29.2	40.1	22.4	30.8	45.8	22.8	31.2	48.1	24.3	32.8	53.9**
4		(1.0)	(0.6)	(1.6)	(0.6)	(0.5)	(1.4)	(0.5)	(0.4)	(1.8)	(0.3)	(0.4)	(1.4)
	2 boys, 1 girl	23.1	30.5**	43.8**	23.5	32.1**	50.5***	23.2	31.9	51.5	25.0	35.3**	62.2***
		(0.9)	(0.7)	(2.4)	(0.6)	(0.7)	(1.9)	(0.7)	(0.6)	(2.8)	(0.5)	(0.6)	(1.3)
	3 boys	20.4	28.7	39.3	22.5	31.4	48.3*	22.8	33.5	57.7***	24.9	33.9	58.4**
		(1.3)	(0.9)	(2.8)	(1.2)	(1.1)	(2.7)	(1.3)	(1.4)	(3.0)	(0.8)	(1.1)	(3.5)

Note. The statistics for each spell/period combination are calculated based on the hazard model for that combination as described in the main text, using bootstrapping to find the standard errors shown in parentheses. For bootstrapping, the original sample is resampled, the hazard model run on the resampled data, and the statistics calculated. This process is repeated 100 times and the standard errors calculated.

[a] Percentile birth interval lengths calculated as follows. For each woman in a given spell/period combination sample, I calculate the time point at which there is a given percent chance that she will have given birth, conditional on the probability that she will eventually give birth in that spell. For example, if there is an 80% chance that a woman will give birth by the end of the spell, her median birth interval is the predicted number of months before she passes the 60% mark on her survival curve plus nine months to account for spell start. The reported statistics is the average of a given percentile interval across all women in a given sample using the individual predicted probabilities of having had a birth by the end of the spell as weights. Birth intervals for sex compositions other than all girls are tested against the duration for all girls, with *** indicating significantly different at the 1% level, ** at the 5% level, and * at the 10% level.

Table E.3: Estimated 25th, 50th, and 75th Percentile Birth Interval Lengths for Women with 8–11 Years of Education

		1972–1984			1985–1994			1995–2004			2005–2016		
		Interval (Months)[a] Percentile			Interval (Months)[a] Percentile			Interval (Months)[a] Percentile			Interval (Months)[a] Percentile		
Spell	Composition of Prior Children	25th	50th	75th	25th	50th	75th	25th	50th	75th	25th	50th	75th
							Urban						
	1 girl	20.0	26.8	37.9	21.7	30.5	45.2	22.7	31.9	47.2	24.0	34.3	50.5
2		(0.4)	(0.3)	(0.7)	(0.3)	(0.4)	(0.7)	(0.2)	(0.3)	(0.5)	(0.3)	(0.4)	(0.9)
	1 boy	20.8	27.6	40.4**	22.2	31.0	45.1	23.1*	32.2	47.6	24.0	33.9	50.5
		(0.4)	(0.5)	(0.9)	(0.3)	(0.5)	(0.7)	(0.2)	(0.3)	(0.5)	(0.2)	(0.4)	(0.7)
	2 girls	22.4	29.5	42.1	24.4	34.6	51.2	24.7	35.2	52.9	26.5	39.3	59.4
		(0.4)	(0.8)	(1.6)	(0.6)	(0.9)	(1.6)	(0.5)	(0.8)	(1.3)	(0.5)	(1.0)	(1.6)
3	1 boy, 1 girl	21.4	29.0	43.2	22.6**	32.2*	48.2	23.1***	32.4***	48.7**	24.5***	35.0***	51.6***
		(0.4)	(0.7)	(1.3)	(0.4)	(0.7)	(1.2)	(0.3)	(0.6)	(1.0)	(0.5)	(0.9)	(1.7)
	2 boys	22.5	31.0	46.0*	23.4	33.7	50.1	24.0	32.3***	46.7***	24.6***	37.0	57.7
		(0.5)	(1.0)	(1.4)	(0.7)	(1.0)	(2.1)	(0.4)	(0.7)	(1.1)	(0.5)	(1.8)	(2.7)
	3 girls	23.4	30.1	41.5	22.9	33.6	54.0	25.7	36.9	57.8	27.9	41.6	63.4
		(1.7)	(1.2)	(4.1)	(1.2)	(1.8)	(3.0)	(1.3)	(2.1)	(2.4)	(1.0)	(1.9)	(1.5)
	1 boy, 2 girls	19.5*	28.7	39.4	24.1	33.3	56.4	23.9	33.6	58.2	25.6*	35.3***	63.0
4		(1.4)	(1.0)	(3.6)	(1.0)	(1.0)	(3.1)	(1.0)	(1.2)	(3.0)	(0.8)	(1.2)	(3.1)
	2 boys, 1 girl	19.3*	28.8	40.3	21.7	31.5	51.2	22.1	34.5	63.2	22.6***	34.1**	62.3
		(1.5)	(1.2)	(4.0)	(1.4)	(1.3)	(5.6)	(1.7)	(2.1)	(4.1)	(1.7)	(2.4)	(6.5)
	3 boys	20.8	29.5	40.8	24.5	35.8	63.6	24.0	32.7	54.5	24.5	36.5	66.4
		(2.3)	(2.0)	(7.3)	(2.3)	(3.9)	(6.4)	(1.7)	(2.0)	(8.0)	(2.9)	(5.6)	(7.8)
							Rural						
	1 girl	20.8	29.1	39.0	22.0	29.6	42.2	22.5	30.3	43.1	23.1	31.7	46.0
2		(0.4)	(0.5)	(0.8)	(0.2)	(0.3)	(0.6)	(0.1)	(0.2)	(0.3)	(0.1)	(0.2)	(0.5)
	1 boy	21.1	28.3	39.2	21.9	29.3	41.6	22.5	30.1	43.4	23.2	32.2	47.0
		(0.4)	(0.5)	(1.1)	(0.3)	(0.4)	(0.8)	(0.1)	(0.2)	(0.3)	(0.1)	(0.2)	(0.5)
	2 girls	22.7	30.0	41.0	23.3	31.9	45.5	23.3	32.2	46.0	25.3	35.2	51.7
		(0.7)	(0.9)	(1.5)	(0.4)	(0.9)	(1.5)	(0.2)	(0.4)	(0.7)	(0.2)	(0.4)	(0.8)
3	1 boy, 1 girl	22.6	29.0	40.4	23.1	31.0	43.5	22.9	30.9**	44.5*	23.3***	32.2***	46.6***
		(0.4)	(0.7)	(1.1)	(0.3)	(0.5)	(0.9)	(0.2)	(0.3)	(0.6)	(0.2)	(0.4)	(0.6)
	2 boys	23.0	31.3	43.7	22.9	30.6	43.4	23.2	31.0*	44.9	24.0***	33.3***	48.7*
		(0.7)	(1.2)	(1.8)	(0.5)	(0.8)	(1.8)	(0.3)	(0.5)	(1.0)	(0.3)	(0.6)	(1.2)
	3 girls	19.4	28.5	40.3	24.7	35.9	55.1	26.1	34.8	53.4	25.3	35.2	55.6
		(2.2)	(2.2)	(4.1)	(1.2)	(2.0)	(2.3)	(0.5)	(1.1)	(1.7)	(0.4)	(0.8)	(1.2)
	1 boy, 2 girls	24.2*	31.8	47.8	23.2	33.2	54.6	23.5***	31.6***	48.9	24.8	34.6	60.8***
4		(1.3)	(1.5)	(3.5)	(1.0)	(1.0)	(2.1)	(0.6)	(0.5)	(2.5)	(0.5)	(0.7)	(1.8)
	2 boys, 1 girl	24.9**	33.2*	53.4**	23.5	33.7	57.9	24.4*	32.4*	51.8	26.3	38.1	68.1***
		(1.3)	(1.7)	(5.0)	(1.3)	(1.6)	(3.7)	(0.8)	(0.8)	(4.1)	(0.8)	(1.8)	(1.6)
	3 boys	22.0	30.6	46.2	20.7*	32.0	55.2	24.9	33.2	55.1	26.3	36.4	64.6**
		(2.4)	(2.8)	(7.7)	(2.1)	(3.0)	(7.0)	(1.2)	(1.3)	(5.0)	(1.1)	(2.3)	(3.3)

Note. The statistics for each spell/period combination are calculated based on the hazard model for that combination as described in the main text, using bootstrapping to find the standard errors shown in parentheses. For bootstrapping, the original sample is resampled, the hazard model run on the resampled data, and the statistics calculated. This process is repeated 100 times and the standard errors calculated.

[a] Percentile birth interval lengths calculated as follows. For each woman in a given spell/period combination sample, I calculate the time point at which there is a given percent chance that she will have given birth, conditional on the probability that she will eventually give birth in that spell. For example, if there is an 80% chance that a woman will give birth by the end of the spell, her median birth interval is the predicted number of months before she passes the 60% mark on her survival curve plus nine months to account for spell start. The reported statistics is the average of a given percentile interval across all women in a given sample using the individual predicted probabilities of having had a birth by the end of the spell as weights. Birth intervals for sex compositions other than all girls are tested against the duration for all girls, with *** indicating significantly different at the 1% level, ** at the 5% level, and * at the 10% level.

Table E.4: Estimated 25th, 50th, and 75th Percentile Birth Interval Lengths for Women with 12 or More Years of Education

		1972–1984			1985–1994			1995–2004			2005–2016		
		Interval (Months)[a] Percentile			Interval (Months)[a] Percentile			Interval (Months)[a] Percentile			Interval (Months)[a] Percentile		
Spell	Composition of Prior Children	25th	50th	75th	25th	50th	75th	25th	50th	75th	25th	50th	75th
							Urban						
	1 girl	23.3	33.4	47.9	24.4	37.8	55.8	26.5	39.9	57.6	28.0	42.3	60.0
2		(0.6)	(0.7)	(1.3)	(0.5)	(0.6)	(1.1)	(0.3)	(0.5)	(0.7)	(0.3)	(0.5)	(0.7)
	1 boy	22.7	34.4	50.3	25.9**	39.3	55.6	25.9	38.4**	57.0	28.3	43.0	61.5
		(0.6)	(0.8)	(1.2)	(0.5)	(0.7)	(0.8)	(0.3)	(0.4)	(0.6)	(0.4)	(0.7)	(0.9)
	2 girls	24.8	33.8	48.4	24.5	39.0	63.5	29.6	43.1	60.6	30.5	48.4	69.3
		(1.0)	(1.4)	(2.6)	(1.2)	(1.8)	(3.5)	(1.0)	(1.2)	(1.6)	(1.1)	(1.8)	(2.5)
3	1 boy, 1 girl	23.4	33.9	56.5**	24.9	36.5	54.6**	24.8***	35.4***	55.2**	25.7***	37.5***	55.3***
		(0.8)	(2.1)	(2.9)	(0.8)	(1.6)	(2.8)	(0.6)	(1.0)	(2.1)	(0.8)	(1.5)	(3.1)
	2 boys	22.8	35.6	54.8	25.2	38.8	53.5*	23.7***	34.3***	50.1***	25.1***	38.6***	56.9**
		(1.6)	(2.7)	(3.6)	(1.3)	(2.3)	(3.9)	(0.8)	(1.3)	(2.4)	(1.2)	(2.2)	(5.6)
							Rural						
	1 girl	22.5	30.6	42.8	23.7	33.7	49.0	24.6	34.2	49.9	24.8	35.9	52.8
2		(1.1)	(1.7)	(2.9)	(0.6)	(0.9)	(2.1)	(0.3)	(0.5)	(0.7)	(0.2)	(0.4)	(0.7)
	1 boy	22.8	32.2	47.2	24.8	34.9	50.9	24.3	34.1	49.4	24.6	35.4	52.9
		(1.0)	(2.0)	(2.9)	(0.7)	(1.0)	(2.2)	(0.3)	(0.5)	(0.7)	(0.3)	(0.4)	(0.8)
	2 girls	23.3	30.5	40.0	28.1	38.2	57.2	25.6	35.7	52.7	27.6	40.9	59.3
		(2.5)	(3.5)	(3.6)	(1.6)	(2.4)	(4.5)	(0.7)	(1.1)	(1.8)	(0.6)	(1.0)	(1.5)
3	1 boy, 1 girl	24.3	32.0	47.7	23.6**	36.5	52.3	23.6**	33.3	48.7	23.9***	34.3***	53.0**
		(1.6)	(3.1)	(6.1)	(1.0)	(2.5)	(3.9)	(0.5)	(1.0)	(1.8)	(0.4)	(0.8)	(2.2)
	2 boys	25.0	34.2	43.3	21.3***	33.0	46.9	22.9**	31.9**	47.8	24.8**	34.9***	50.3**
		(2.9)	(2.6)	(5.3)	(2.1)	(3.7)	(6.0)	(0.9)	(1.4)	(3.0)	(0.8)	(1.5)	(3.0)

Note. The statistics for each spell/period combination are calculated based on the hazard model for that combination as described in the main text, using bootstrapping to find the standard errors shown in parentheses. For bootstrapping, the original sample is resampled, the hazard model run on the resampled data, and the statistics calculated. This process is repeated 100 times and the standard errors calculated.

[a] Percentile birth interval lengths calculated as follows. For each woman in a given spell/period combination sample, I calculate the time point at which there is a given percent chance that she will have given birth, conditional on the probability that she will eventually give birth in that spell. For example, if there is an 80% chance that a woman will give birth by the end of the spell, her median birth interval is the predicted number of months before she passes the 60% mark on her survival curve plus nine months to account for spell start. The reported statistics is the average of a given percentile interval across all women in a given sample using the individual predicted probabilities of having had a birth by the end of the spell as weights. Birth intervals for sex compositions other than all girls are tested against the duration for all girls, with *** indicating significantly different at the 1% level, ** at the 5% level, and * at the 10% level.

Table E.5: Estimated Average Birth Interval Length in Months, Sex Ratio, and Probability of Parity Progression for Women with No Education

		1972–1984			1985–1994			1995–2004			2005–2016		
Spell	Composition of prior Children	Interval[a] (Mos)	Percent[b] boys	Probability birth[c]	Interval[a] (Mos)	Percent[b] boys	Probability birth[c]	Interval[a] (Mos)	Percent[b] boys	Probability birth[c]	Interval[a] (Mos)	Percent[b] boys	Probability birth[c]
								Urban					
	1 girl	30.7	52.2	0.970	31.5	52.5	0.953	32.8	51.7	0.950	33.1	56.0***	0.932
2		(0.4)	(1.3)	(0.004)	(0.3)	(1.1)	(0.005)	(0.3)	(0.8)	(0.004)	(0.5)	(1.2)	(0.009)
	1 boy	32.2***	52.9	0.961	33.3***	50.8	0.959	33.4	52.1	0.951	33.1	50.3	0.905
		(0.4)	(1.3)	(0.005)	(0.4)	(1.2)	(0.004)	(0.3)	(0.9)	(0.004)	(0.5)	(1.2)	(0.008)
	2 girls	32.3	51.4	0.968	32.0	51.6	0.967	34.4	52.4	0.933	36.2	52.6	0.894
		(0.7)	(2.1)	(0.009)	(0.7)	(1.6)	(0.009)	(0.5)	(1.6)	(0.008)	(0.9)	(2.0)	(0.015)
3	1 boy, 2 girl	31.4	54.6**	0.947	33.4*	50.7	0.925	34.7	52.3	0.877	34.1*	53.7*	0.747
		(0.5)	(1.5)	(0.007)	(0.4)	(1.3)	(0.007)	(0.4)	(1.2)	(0.008)	(0.7)	(1.5)	(0.014)
	2 boys	32.4	48.6	0.962	33.9*	48.3	0.917	34.5	48.1*	0.855	36.7	51.6	0.756
		(0.7)	(2.1)	(0.008)	(0.7)	(1.9)	(0.013)	(0.6)	(1.7)	(0.012)	(1.1)	(2.2)	(0.020)
	3 girls	29.9	57.2	0.977	34.0	51.3	0.955	35.1	54.4	0.945	38.2	55.7	0.923
		(1.3)	(4.1)	(0.016)	(0.9)	(2.6)	(0.015)	(0.9)	(2.7)	(0.017)	(1.0)	(3.1)	(0.016)
	1 boy, 2 girls	32.3	54.9	0.954	34.7	54.4*	0.940	36.5	52.9	0.850	39.8	49.6	0.760
4		(0.8)	(2.4)	(0.011)	(0.6)	(1.7)	(0.009)	(0.7)	(1.8)	(0.014)	(0.9)	(2.1)	(0.018)
	2 boys, 1 girl	34.5***	54.8	0.919	38.3***	50.1	0.909	39.0***	55.0*	0.760	41.2*	54.8	0.569
		(0.9)	(2.6)	(0.017)	(0.6)	(2.2)	(0.013)	(0.8)	(2.2)	(0.018)	(1.3)	(2.8)	(0.023)
	3 boys	35.6***	60.6**	0.965	38.6***	57.1	0.912	35.5	51.2	0.779	40.9	47.8	0.703
		(1.6)	(3.7)	(0.018)	(1.0)	(3.7)	(0.020)	(1.5)	(3.5)	(0.031)	(2.1)	(4.1)	(0.037)
								Rural					
	1 girl	31.4	51.2	0.974	32.4	52.1*	0.965	33.0	51.7	0.969	33.0	51.7	0.959
2		(0.2)	(0.6)	(0.002)	(0.2)	(0.5)	(0.003)	(0.1)	(0.4)	(0.001)	(0.2)	(0.5)	(0.003)
	1 boy	32.1***	52.7**	0.968	33.1***	51.4	0.962	33.3*	51.1	0.960	33.5**	52.2*	0.936
		(0.2)	(0.6)	(0.002)	(0.2)	(0.5)	(0.002)	(0.1)	(0.4)	(0.002)	(0.2)	(0.5)	(0.003)
	2 girls	30.2	49.6	0.975	32.8	53.7***	0.963	33.1	53.9***	0.965	33.8	52.9**	0.942
		(0.3)	(1.1)	(0.003)	(0.3)	(0.8)	(0.004)	(0.2)	(0.7)	(0.002)	(0.2)	(0.7)	(0.005)
3	1 boy, 2 girl	31.7***	53.0**	0.963	32.9	51.7	0.951	33.6**	52.4**	0.913	35.1***	51.8	0.852
		(0.2)	(0.7)	(0.003)	(0.2)	(0.6)	(0.003)	(0.2)	(0.5)	(0.003)	(0.2)	(0.6)	(0.004)
	2 boys	31.7***	51.9	0.958	34.0***	51.3	0.934	34.4***	50.7	0.882	36.0***	50.9	0.797
		(0.3)	(1.0)	(0.004)	(0.3)	(0.8)	(0.005)	(0.2)	(0.7)	(0.005)	(0.3)	(0.7)	(0.008)
	3 girls	31.1	54.5	0.977	33.2	50.5	0.977	33.4	52.8	0.971	36.0	54.0***	0.955
		(0.6)	(2.0)	(0.006)	(0.3)	(1.2)	(0.004)	(0.4)	(1.2)	(0.004)	(0.3)	(1.0)	(0.005)
	1 boy, 2 girls	32.3*	52.2	0.976	35.4***	53.1**	0.958	35.8***	52.8*	0.911	38.5***	52.2	0.870
4		(0.4)	(1.1)	(0.004)	(0.2)	(0.9)	(0.003)	(0.3)	(0.9)	(0.005)	(0.3)	(0.8)	(0.005)
	2 boys, 1 girl	32.7**	53.2*	0.958	36.8***	49.8	0.926	38.0***	51.1	0.822	42.2***	50.5	0.694
		(0.4)	(1.2)	(0.006)	(0.3)	(0.9)	(0.005)	(0.3)	(0.9)	(0.007)	(0.4)	(0.9)	(0.009)
	3 boys	33.3**	51.5	0.962	37.3***	50.7	0.924	38.2***	52.0	0.851	41.7***	51.6	0.753
		(0.6)	(2.1)	(0.009)	(0.5)	(1.3)	(0.009)	(0.7)	(1.5)	(0.014)	(0.7)	(1.7)	(0.015)

Note. The statistics for each spell/period combination are calculated based on the competing risk hazard model for that combination as described in the main text, using bootstrapping to find the standard errors shown in parentheses. For bootstrapping, the original sample is resampled, the hazard model run on the resampled data, and the statistics calculated. This process is repeated 100 times and the standard errors calculated.

[a] Average birth interval length is calculated as follows. For each woman in a given spell/period combination sample, I calculate the probability of that she will give birth for each period, conditional on the likelihood that she will eventually give birth in that spell, and use these probabilities as weights to calculated the expected spell duration. The reported statistics is the average of these intervals across all women in a given sample using the individual predicted probabilities of having had a birth by the end of the spell as weights with nine months added to account for spell start. Birth intervals for sex compositions other than all girls are tested against the duration for all girls, with *** indicating significantly different at the 1% level, ** at the 5% level, and * at the 10% level.

[b] Percent boys is calculated as follows. For each woman in a given spell/period combination sample, I calculate the predicted percent boys for each month and sum this across the length of the spell using the likelihood of having a child in each month as the weight. The percent boys is then averaged across all women in the given sample using the individual predicted probabilities of having had a birth by the end of the spell as weights. The result is the predicted percent boys that will be born to women in the sample once child bearing for that spell is over. The predicted percent boys is tested against the natural percentage boys, 105 boys per 100 girls, with *** indicating significantly different at the 1% level, ** at the 5% level, and * at 10% level.

[c] Probability of giving birth by the end of the spell period.

Table E.6: Estimated Average Birth Interval Length in Months, Sex Ratio, and Probability of Parity Progression for Women with 1–7 Years of Education

Spell	Composition of prior Children	1972–1984 Interval[a] (Mos)	1972–1984 Percent[b] boys	1972–1984 Probability birth[c]	1985–1994 Interval[a] (Mos)	1985–1994 Percent[b] boys	1985–1994 Probability birth[c]	1995–2004 Interval[a] (Mos)	1995–2004 Percent[b] boys	1995–2004 Probability birth[c]	2005–2016 Interval[a] (Mos)	2005–2016 Percent[b] boys	2005–2016 Probability birth[c]
	Urban												
	1 girl	29.4	51.5	0.970	32.4	52.6	0.942	33.9	53.2**	0.928	35.3	52.7	0.909
2		(0.4)	(1.5)	(0.005)	(0.4)	(1.2)	(0.006)	(0.3)	(0.9)	(0.005)	(0.5)	(1.3)	(0.009)
	1 boy	31.4***	51.3	0.961	33.4	51.3	0.936	34.2	49.9	0.922	36.7**	51.0	0.862
		(0.5)	(1.6)	(0.006)	(0.5)	(1.3)	(0.006)	(0.3)	(0.9)	(0.006)	(0.6)	(1.2)	(0.009)
	2 girls	30.6	56.0*	0.954	34.7	52.4	0.928	37.2	56.6***	0.890	39.5	56.5**	0.841
		(0.8)	(2.7)	(0.012)	(0.9)	(2.1)	(0.012)	(0.8)	(1.5)	(0.011)	(0.8)	(2.2)	(0.017)
3	1 boy, 2 girl	33.2**	53.0	0.891	35.2	53.8*	0.837	35.7	51.6	0.730	36.6**	55.8***	0.609
		(0.6)	(1.8)	(0.011)	(0.7)	(1.6)	(0.012)	(0.6)	(1.4)	(0.013)	(0.9)	(1.7)	(0.017)
	2 boys	32.0	48.2	0.893	36.2	50.8	0.844	35.9	49.4	0.704	38.3	52.2	0.567
		(0.8)	(2.4)	(0.016)	(0.9)	(2.1)	(0.016)	(0.9)	(2.4)	(0.016)	(1.3)	(2.5)	(0.020)
	3 girls	33.1	49.8	0.944	35.3	55.9	0.922	40.9	61.6***	0.877	39.7	57.7*	0.845
		(1.8)	(5.1)	(0.030)	(1.2)	(3.7)	(0.021)	(1.2)	(3.7)	(0.029)	(1.3)	(3.6)	(0.029)
	1 boy, 2 girls	33.9	54.2	0.885	38.3*	56.4**	0.792	38.3*	55.3	0.657	38.4	51.3	0.579
4		(1.1)	(3.0)	(0.021)	(1.0)	(2.5)	(0.022)	(1.0)	(2.6)	(0.023)	(1.1)	(2.7)	(0.023)
	2 boys, 1 girl	35.4	50.7	0.851	40.7***	56.0	0.731	39.5	55.3	0.580	45.2**	49.2	0.437
		(1.4)	(3.6)	(0.031)	(1.2)	(3.3)	(0.027)	(1.2)	(3.0)	(0.024)	(1.8)	(4.1)	(0.027)
	3 boys	36.2	55.0	0.738	38.7*	41.7**	0.855	38.9	43.1	0.693	45.8*	60.1	0.542
		(3.5)	(6.7)	(0.068)	(1.6)	(4.2)	(0.033)	(2.1)	(5.5)	(0.043)	(3.2)	(6.7)	(0.053)
	Rural												
	1 girl	30.9	51.6	0.977	32.3	51.4	0.965	33.5	53.3***	0.963	34.4	52.8**	0.950
2		(0.3)	(1.1)	(0.003)	(0.3)	(0.9)	(0.004)	(0.2)	(0.5)	(0.002)	(0.3)	(0.7)	(0.004)
	1 boy	32.4***	50.0	0.971	33.0*	51.5	0.954	33.9	51.1	0.945	35.3***	50.5	0.908
		(0.3)	(1.0)	(0.004)	(0.3)	(0.8)	(0.004)	(0.2)	(0.5)	(0.002)	(0.2)	(0.6)	(0.004)
	2 girls	29.5	50.6	0.966	31.4	54.1**	0.939	34.6	53.6**	0.933	36.5	55.4***	0.892
		(0.5)	(1.9)	(0.007)	(0.4)	(1.4)	(0.008)	(0.4)	(1.0)	(0.005)	(0.4)	(1.0)	(0.007)
3	1 boy, 2 girl	32.4***	51.4	0.931	34.4***	51.7	0.887	34.9	52.5*	0.793	37.1	53.6**	0.707
		(0.5)	(1.3)	(0.007)	(0.4)	(1.2)	(0.007)	(0.3)	(0.8)	(0.006)	(0.4)	(1.0)	(0.008)
	2 boys	34.3***	49.6	0.929	35.1***	50.8	0.866	35.5*	49.5	0.741	37.5	49.4	0.633
		(0.8)	(2.0)	(0.011)	(0.7)	(1.5)	(0.011)	(0.5)	(1.1)	(0.009)	(0.6)	(1.4)	(0.011)
	3 girls	31.6	49.5	0.983	35.0	54.2	0.962	37.5	55.5**	0.947	39.4	57.7***	0.920
		(1.1)	(3.7)	(0.011)	(0.7)	(2.7)	(0.009)	(0.7)	(2.0)	(0.009)	(0.5)	(1.5)	(0.011)
	1 boy, 2 girls	34.4**	50.0	0.930	36.9**	55.1**	0.893	38.3	52.9	0.755	40.7*	51.9	0.702
4		(0.8)	(2.4)	(0.014)	(0.6)	(1.6)	(0.011)	(0.6)	(1.4)	(0.015)	(0.5)	(1.4)	(0.013)
	2 boys, 1 girl	36.6***	46.5*	0.885	39.1***	51.0	0.846	39.7**	52.1	0.597	44.0***	52.4	0.541
		(0.9)	(2.7)	(0.020)	(0.8)	(2.1)	(0.015)	(0.9)	(1.8)	(0.017)	(0.7)	(1.8)	(0.014)
	3 boys	33.7	55.0	0.939	37.9**	56.7*	0.883	41.6***	51.6	0.686	42.5**	44.1*	0.546
		(1.4)	(4.5)	(0.022)	(1.2)	(3.2)	(0.024)	(1.4)	(3.8)	(0.029)	(1.4)	(3.7)	(0.027)

Note. The statistics for each spell/period combination are calculated based on the competing risk hazard model for that combination as described in the main text, using bootstrapping to find the standard errors shown in parentheses. For bootstrapping, the original sample is resampled, the hazard model run on the resampled data, and the statistics calculated. This process is repeated 100 times and the standard errors calculated.

[a] Average birth interval length is calculated as follows. For each woman in a given spell/period combination sample, I calculate the probability of that she will give birth for each period, conditional on the likelihood that she will eventually give birth in that spell, and use these probabilities as weights to calculated the expected spell duration. The reported statistics is the average of these intervals across all women in a given sample using the individual predicted probabilities of having had a birth by the end of the spell as weights with nine months added to account for spell start. Birth intervals for sex compositions other than all girls are tested against the duration for all girls, with *** indicating significantly different at the 1% level, ** at the 5% level, and * at the 10% level.

[b] Percent boys is calculated as follows. For each woman in a given spell/period combination sample, I calculate the predicted percent boys for each month and sum this across the length of the spell using the likelihood of having a child in each month as the weight. The percent boys is then averaged across all women in the given sample using the individual predicted probabilities of having had a birth by the end of the spell as weights. The result is the predicted percent boys that will be born to women in the sample once child bearing for that spell is over. The predicted percent boys is tested against the natural percentage boys, 105 boys per 100 girls, with *** indicating significantly different at the 1% level, ** at the 5% level, and * at 10% level.

[c] Probability of giving birth by the end of the spell period.

Table E.7: Estimated Average Birth Interval Length in Months, Sex Ratio, and Probability of Parity Progression for Women with 8–11 Years of Education

		1972–1984			1985–1994			1995–2004			2005–2016		
Spell	Composition of prior Children	Interval[a] (Mos)	Percent[b] boys	Probability birth[c]	Interval[a] (Mos)	Percent[b] boys	Probability birth[c]	Interval[a] (Mos)	Percent[b] boys	Probability birth[c]	Interval[a] (Mos)	Percent[b] boys	Probability birth[c]
							Urban						
2	1 girl	31.4	52.0	0.947	35.8	54.3***	0.919	37.1	55.8***	0.897	39.4	52.9*	0.866
		(0.4)	(1.4)	(0.005)	(0.4)	(1.1)	(0.007)	(0.3)	(0.7)	(0.004)	(0.4)	(1.0)	(0.007)
	1 boy	32.7*	53.5*	0.932	35.9	51.4	0.882	37.7	50.1*	0.867	39.5	50.4	0.780
		(0.6)	(1.2)	(0.007)	(0.4)	(1.0)	(0.007)	(0.3)	(0.7)	(0.004)	(0.4)	(0.9)	(0.009)
3	2 girls	34.5	53.8	0.891	39.9	61.0***	0.790	41.1	61.2***	0.786	44.9	60.2***	0.725
		(1.0)	(2.5)	(0.015)	(0.9)	(2.3)	(0.018)	(0.7)	(1.6)	(0.013)	(0.8)	(1.8)	(0.015)
	1 boy, 2 girl	35.1	55.1*	0.771	37.8	52.6	0.613	38.4***	52.4	0.537	40.9***	54.5**	0.379
		(0.8)	(2.0)	(0.014)	(0.8)	(1.7)	(0.013)	(0.6)	(1.3)	(0.010)	(1.0)	(1.6)	(0.012)
	2 boys	36.5	50.6	0.710	39.9	53.3	0.617	37.6***	48.0	0.512	43.5	48.9	0.360
		(0.9)	(2.9)	(0.023)	(1.2)	(2.1)	(0.020)	(0.8)	(2.3)	(0.017)	(1.4)	(3.2)	(0.019)
4	3 girls	35.9	59.6	0.850	40.2	64.1***	0.831	43.0	61.6**	0.846	46.6	62.5***	0.790
		(1.9)	(6.7)	(0.038)	(1.5)	(3.8)	(0.025)	(1.6)	(4.1)	(0.026)	(1.2)	(3.7)	(0.025)
	1 boy, 2 girls	34.9	52.4	0.660	41.5	52.5	0.573	42.0	61.6***	0.527	44.4	61.3***	0.383
		(1.6)	(4.3)	(0.035)	(1.3)	(2.9)	(0.025)	(1.3)	(2.7)	(0.024)	(1.4)	(3.3)	(0.023)
	2 boys, 1 girl	35.3	52.5	0.637	39.2	47.8	0.504	43.3	51.2	0.346	43.1	53.9	0.241
		(1.8)	(4.3)	(0.040)	(1.8)	(4.0)	(0.033)	(2.0)	(4.8)	(0.024)	(2.7)	(5.0)	(0.025)
	3 boys	35.8	55.5	0.677	44.4	58.1	0.495	40.9	47.9	0.457	45.5	52.4	0.325
		(3.2)	(7.9)	(0.065)	(3.2)	(8.0)	(0.052)	(2.8)	(7.3)	(0.050)	(4.0)	(8.8)	(0.044)
							Rural						
2	1 girl	32.4	50.9	0.970	34.1	52.7	0.951	34.9	55.0***	0.943	36.8	54.5***	0.922
		(0.6)	(1.7)	(0.006)	(0.4)	(1.1)	(0.005)	(0.2)	(0.5)	(0.003)	(0.3)	(0.5)	(0.004)
	1 boy	32.4	48.3*	0.948	34.1	50.8	0.923	35.2	50.4	0.904	37.4	49.9**	0.838
		(0.6)	(1.7)	(0.007)	(0.5)	(1.2)	(0.006)	(0.2)	(0.6)	(0.003)	(0.3)	(0.6)	(0.005)
3	2 girls	34.6	55.4	0.946	36.5	58.4***	0.912	37.2	59.5***	0.878	40.9	58.4***	0.833
		(1.1)	(3.3)	(0.014)	(0.9)	(2.2)	(0.013)	(0.4)	(1.1)	(0.008)	(0.4)	(1.0)	(0.007)
	1 boy, 2 girl	33.9	52.3	0.832	35.0	52.5	0.703	36.0**	54.5***	0.637	37.7***	53.2**	0.492
		(0.8)	(2.3)	(0.017)	(0.7)	(1.9)	(0.014)	(0.4)	(0.9)	(0.008)	(0.5)	(1.0)	(0.007)
	2 boys	35.6	45.9	0.806	35.3	48.7	0.692	36.3	50.4	0.589	39.3	49.6	0.449
		(1.3)	(3.3)	(0.025)	(1.1)	(2.5)	(0.021)	(0.6)	(1.4)	(0.013)	(0.8)	(1.6)	(0.011)
4	3 girls	32.3	50.4	0.976	41.4	60.9**	0.872	41.2	61.3***	0.880	41.8	59.9***	0.844
		(2.6)	(7.5)	(0.025)	(1.4)	(4.6)	(0.027)	(0.9)	(2.8)	(0.017)	(0.7)	(1.9)	(0.014)
	1 boy, 2 girls	38.2**	44.2	0.876	40.6	51.0	0.767	39.0*	55.3*	0.611	43.3	55.3**	0.491
		(1.6)	(4.3)	(0.035)	(1.0)	(2.8)	(0.024)	(0.8)	(2.1)	(0.017)	(0.8)	(1.9)	(0.013)
	2 boys, 1 girl	40.8***	50.9	0.764	41.9	55.1	0.624	40.2	52.2	0.489	47.1***	48.9	0.389
		(2.0)	(5.1)	(0.051)	(1.6)	(4.2)	(0.033)	(1.2)	(3.1)	(0.020)	(1.1)	(2.7)	(0.019)
	3 boys	37.1	56.1	0.820	40.0	42.7	0.625	41.4	60.3*	0.599	45.5*	60.9**	0.449
		(3.6)	(10.6)	(0.072)	(3.0)	(6.9)	(0.060)	(1.8)	(4.9)	(0.043)	(1.9)	(4.5)	(0.031)

Note. The statistics for each spell/period combination are calculated based on the competing risk hazard model for that combination as described in the main text, using bootstrapping to find the standard errors shown in parentheses. For bootstrapping, the original sample is resampled, the hazard model run on the resampled data, and the statistics calculated. This process is repeated 100 times and the standard errors calculated.

[a] Average birth interval length is calculated as follows. For each woman in a given spell/period combination sample, I calculate the probability of that she will give birth for each period, conditional on the likelihood that she will eventually give birth in that spell, and use these probabilities as weights to calculated the expected spell duration. The reported statistics is the average of these intervals across all women in a given sample using the individual predicted probabilities of having had a birth by the end of the spell as weights with nine months added to account for spell start. Birth intervals for sex compositions other than all girls are tested against the duration for all girls, with *** indicating significantly different at the 1% level, ** at the 5% level, and * at the 10% level.

[b] Percent boys is calculated as follows. For each woman in a given spell/period combination sample, I calculate the predicted percent boys for each month and sum this across the length of the spell using the likelihood of having a child in each month as the weight. The percent boys is then averaged across all women in the given sample using the individual predicted probabilities of having had a birth by the end of the spell as weights. The result is the predicted percent boys that will be born to women in the sample once child bearing for that spell is over. The predicted percent boys is tested against the natural percentage boys, 105 boys per 100 girls, with *** indicating significantly different at the 1% level, ** at the 5% level, and * at 10% level.

[c] Probability of giving birth by the end of the spell period.

Table E.8: Estimated Average Birth Interval Length in Months, Sex Ratio, and Probability of Parity Progression for Women with 12 or More Years of Education

		1972–1984			1985–1994			1995–2004			2005–2016		
Spell	Composition of prior Children	Inter-val[a] (Mos)	Per-cent[b] boys	Proba-bility birth[c]	Inter-val[a] (Mos)	Per-cent[b] boys	Proba-bility birth[c]	Inter-val[a] (Mos)	Per-cent[b] boys	Proba-bility birth[c]	Inter-val[a] (Mos)	Per-cent[b] boys	Proba-bility birth[c]
							Urban						
	1 girl	38.3	52.3	0.887	42.0	56.4***	0.853	43.9	60.6***	0.830	45.6	59.0***	0.782
2		(0.7)	(1.8)	(0.011)	(0.6)	(1.2)	(0.009)	(0.4)	(0.8)	(0.006)	(0.4)	(1.0)	(0.008)
	1 boy	38.8	49.1	0.888	43.0	53.1	0.794	43.2	49.7**	0.773	46.8	48.8**	0.669
		(0.7)	(1.9)	(0.010)	(0.5)	(1.2)	(0.010)	(0.3)	(0.7)	(0.006)	(0.6)	(1.0)	(0.008)
	2 girls	39.5	59.9*	0.717	45.4	66.7***	0.598	47.2	72.0***	0.607	51.3	77.1***	0.514
		(1.4)	(5.0)	(0.031)	(1.5)	(2.5)	(0.025)	(1.1)	(1.9)	(0.017)	(1.3)	(2.0)	(0.019)
3	1 boy, 2 girl	41.7	49.1	0.435	42.3	55.4	0.296	42.4***	55.2*	0.252	43.5***	57.8**	0.165
		(1.7)	(4.2)	(0.028)	(1.5)	(3.2)	(0.016)	(0.9)	(2.0)	(0.009)	(1.4)	(2.9)	(0.009)
	2 boys	41.1	47.2	0.439	42.4	45.8	0.259	40.6***	37.7***	0.241	44.1***	48.0	0.172
		(2.2)	(5.2)	(0.033)	(2.3)	(4.7)	(0.021)	(1.3)	(3.1)	(0.015)	(2.1)	(4.1)	(0.012)
							Rural						
	1 girl	35.3	55.3	0.962	38.7	54.0	0.927	39.6	55.3***	0.918	41.0	57.0***	0.891
2		(1.7)	(5.0)	(0.017)	(1.1)	(3.0)	(0.014)	(0.4)	(1.0)	(0.005)	(0.4)	(0.9)	(0.007)
	1 boy	36.9	41.6**	0.923	39.8	52.8	0.838	39.0	51.2	0.843	40.8	48.1***	0.765
		(1.5)	(4.9)	(0.026)	(1.1)	(2.6)	(0.019)	(0.4)	(1.1)	(0.007)	(0.5)	(1.0)	(0.009)
	2 girls	32.0	39.4	0.750	44.2	51.4	0.799	41.5	59.6***	0.800	45.5	65.5***	0.728
		(2.8)	(11.5)	(0.075)	(2.2)	(6.4)	(0.038)	(1.0)	(2.4)	(0.016)	(0.8)	(1.8)	(0.017)
3	1 boy, 2 girl	38.4	69.1	0.655	41.1	67.6***	0.565	39.3	54.1	0.433	40.9***	55.2*	0.312
		(3.1)	(11.0)	(0.070)	(2.4)	(5.1)	(0.037)	(1.1)	(2.4)	(0.017)	(1.1)	(2.1)	(0.012)
	2 boys	36.7	28.6**	0.813	38.1	35.4**	0.568	38.8	44.2**	0.405	40.3***	46.7	0.276
		(3.6)	(9.2)	(0.072)	(3.6)	(7.0)	(0.059)	(1.7)	(3.4)	(0.023)	(1.8)	(3.9)	(0.017)

Note. The statistics for each spell/period combination are calculated based on the competing risk hazard model for that combination as described in the main text, using bootstrapping to find the standard errors shown in parentheses. For bootstrapping, the original sample is resampled, the hazard model run on the resampled data, and the statistics calculated. This process is repeated 100 times and the standard errors calculated.

[a] Average birth interval length is calculated as follows. For each woman in a given spell/period combination sample, I calculate the probability of that she will give birth for each period, conditional on the likelihood that she will eventually give birth in that spell, and use these probabilities as weights to calculated the expected spell duration. The reported statistics is the average of these intervals across all women in a given sample using the individual predicted probabilities of having had a birth by the end of the spell as weights with nine months added to account for spell start. Birth intervals for sex compositions other than all girls are tested against the duration for all girls, with *** indicating significantly different at the 1% level, ** at the 5% level, and * at the 10% level.

[b] Percent boys is calculated as follows. For each woman in a given spell/period combination sample, I calculate the predicted percent boys for each month and sum this across the length of the spell using the likelihood of having a child in each month as the weight. The percent boys is then averaged across all women in the given sample using the individual predicted probabilities of having had a birth by the end of the spell as weights. The result is the predicted percent boys that will be born to women in the sample once child bearing for that spell is over. The predicted percent boys is tested against the natural percentage boys, 105 boys per 100 girls, with *** indicating significantly different at the 1% level, ** at the 5% level, and * at 10% level.

[c] Probability of giving birth by the end of the spell period.

F Infant Mortality Graphs

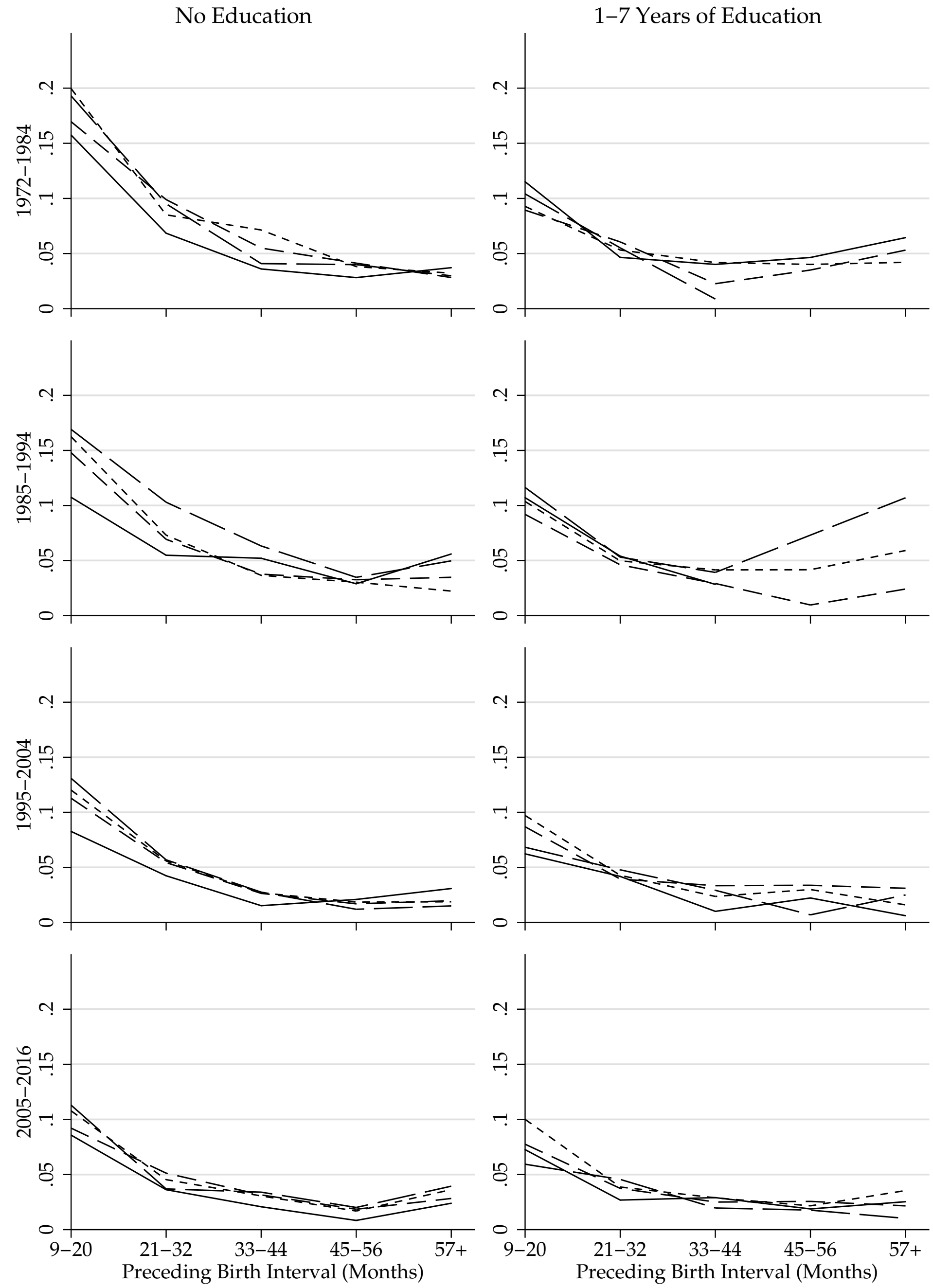


Figure F.1: Infant mortality by preceding birth interval length across periods for third child of women with no education and women with 1–7 years of education

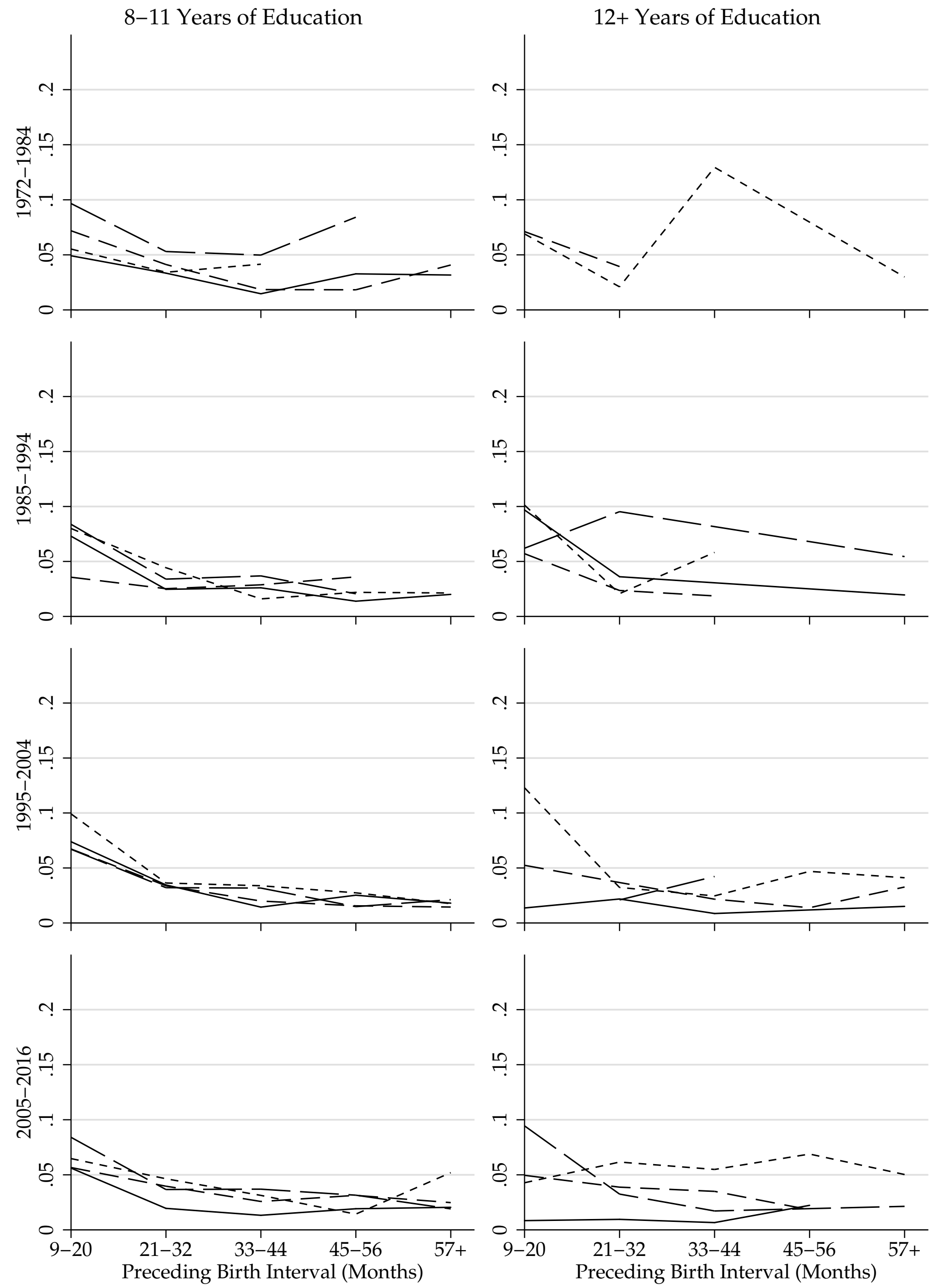


Figure F.2: Infant mortality by preceding birth interval length across periods for third child of women with 8–11 and 12 and above years of education

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