Migration Background and the Risk of Adolescent Childbearing

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The teen birth rate fell by almost one-half between 1991 and 2011 (Hamilton et al. 2013), yet US adolescents are still far more likely than teens in any other industrialized country to give birth (Kearney and Levine 2012). Teen births have been linked with poor health outcomes for the child, including pre-term birth (Chen et al. 2008; Fraser et al. 1995), congenital anomalies (Chen et al. 2007), and post-neonatal mortality (Phipps et al. 2002). Adolescent childbearing is also associated with lower completed schooling and economic disadvantage for the mothers; accounting for factors that predispose women to early motherhood reduces, but does not eliminate, these associations (Kane et al. 2013; Hoffman et al. 1993; Levine and Painter 2003).

In the same period that adolescent birth rates in the United States were falling, the share of youth who were first or second generation immigrants nearly doubled, reaching 24% in 2010 (Passel 2011). Yet despite large literatures on the determinants of teen childbearing (e.g., Kalil and Kunz 1999; Manlove et al. 2000; Santelli et al. 2007) and the fertility of immigrant adults (e.g., Bean et al. 2000; Ford 1990; Parrado and Morgan 2008; Parrado 2011), relatively little scholarship has focused on nativity-based variations in the risk of adolescent childbearing. As the share of youth with migration backgrounds continues to grow (Passel and Cohn 2008), their reproductive behavior will greatly influence future US trends in teen births.

Existing evidence on nativity differences in adolescent childbearing is inconsistent. Several studies find that foreign-born and less acculturated Hispanic adolescents have lower risk of pregnancy than their US-born and more acculturated counterparts (Guarini et al. 2013; Kaplan et al. 2002); other empirical work finds that foreign-born Hispanic adolescent girls are at *higher* risk of teen births than U.S.-born Hispanic, White, or Black girls (Aneshensel et al. 1990; Dehlendorf et al. 2010; Manlove et al. 2013). A higher risk of adolescent fertility may seem to be at odds with accumulating evidence of a later age at sexual onset for youth with migration backgrounds (Goldberg et al. 2013; Greenman and Xie 2008; Harris 1999; McDonald et al. 2009). However, several studies suggest that once sexually active, Hispanic youth with immigrant backgrounds may be less likely than other youth to use contraception and terminate pregnancies (Aneshensel et al. 1990; Manlove et al. 2013; McDonald et al. 2009).

The current study addresses three primary questions. The first is whether and how young women with migration backgrounds differ from their native counterparts in the risk they face of teen childbearing. The second is what family and contextual factors undergird any observed differentials. The third addresses more proximate determinants, asking to what extent observed variation by migration background reflects timing of sexual onset as opposed to post onset factors. I extend existing literature by using nationally representative data that represent youth with a range of backgrounds, and by investigating both proximate and more distal determinants of variation.

Most empirical work to date addressing nativity differentials in teen childbearing has relied on data from small, localized, and often purposive samples (for example, of family planning clients). Studies have also focused on a subset of teens, namely Hispanics, mostly teens of Mexican origin. Because immigrant advantages can vary substantially by country of origin and race/ethnicity, it is important to examine variation in teen fertility among adolescents from a range of backgrounds (Greenman and Xie 2008; Spence and Brewster 2009). In the current study, I analyze data from the National Longitudinal Study of Adolescent Health (Add Health). Add Health's large national sample and oversampling of particular ethnic groups makes it uniquely suited for addressing these limitations of prior research.

The second contribution of this study is its investigation of the social and contextual mechanisms underlying nativity differentials in risk of adolescent childbearing. Prior research has stopped short of explaining observed differences, beyond broad measures of acculturation like language or immigrant generation (McDonald et al. 2009; Santelli et al. 2009). A more nuanced understanding of mechanisms is essential to discern whether risk and protective factors differ for youth with migration backgrounds. I examine three primary mechanisms: *context of socialization*, *family protections*, and *context of reception*.

Context of socialization encompasses the extent to which foreign-born youth were socialized into the norms of the origin or host country (Rumbaut 2004), as well as characteristics of the origin country (Fernandez and Fogli 2006). To proxy the former, I examine age at migration (Rumbaut 2004). There is growing evidence that age at migration is highly consequential for outcomes like language acquisition (Bleakley and Chin 2010; Rumbaut 2004), educational attainment (Beck et al. 2012; Gonzalez 2003), and timing of sexual onset (Goldberg et al. 2013). Because foreign-born young women who migrated at a young age experienced the bulk of their socialization in the United States, it is conceivable that their reproductive behavior is more similar to that of US-born counterparts than foreign-born counterparts who migrated when older.

With regard to specific characteristics of the origin country, several researchers have suggested that higher fertility among Hispanic adolescents with migration backgrounds may reflect age-specific fertility patterns and norms in their countries of origin; however, this claim has not been empirically tested (Santelli et al. 2009; Minnis et al. 2013). Following work by Fernandez and Fogli (2006) and Goldberg et al. (2013), I test this claim by considering whether the risk of a teenage birth varies according to the adolescent birth rate in respondents' countries of birth.

A substantial literature supports the idea that youth with migration backgrounds benefit from *protective family traits* (Perreira and Ornelas 2011). In addition to strong family ties (Santelli et al. 2009), immigrant youth tend to co-reside with both parents (Brandon 2002; Landale et al. 2011; Manlove et al. 2013), and girls especially are subjected to close supervision (Espiritu 2006; Suárez-Orozco and Qin 2006). Parental educational expectations are also often high (Crosnoe and López Turley 2011; Kao and Tienda 1995). Because these traits have also been associated with decreased adolescent sexual risk behavior and fertility (Browning et al. 2005; Goldberg 2013; Hofferth and Goldscheider 2010; Kalil and Kunz 1999; Longmore et al. 2009; Wu 1996), it is likely that immigrant teens are protected by their family circumstances. These protections may be weaker, however, for the first generation, who often experience migration-related separations from parents; these separations have been linked with earlier sexual onset (Goldberg et al. 2013).

My examination of the neighborhoods that constitute the *context of reception* for immigrant youth builds on evidence about residential segregation of foreign-born populations (Borjas 1995) as well as research about how the neighborhoods in which youth live shape their life course (Brooks-Gunn et al. 1993). How residential patterns are linked to nativity variations in childbearing is uncertain. On the one hand, Denner and colleagues (2001) find that strong social networks and more traditional normative orientations prevailing in neighborhoods with high concentrations of immigrants may protect against early childbearing. On the other hand, many immigrant neighborhoods concentrate economic disadvantage, which is linked to early sexual activity and fertility (Browning et al. 2004; South and Baumer 2000).

The final contribution of this study addresses the more proximate determinants of teen fertility. I assess the extent to which observed differences in risk of teen childbearing reflect timing of sexual onset as opposed to post onset behaviors such as contraceptive use. It is also possible that the familial and contextual mechanisms proposed above influence sexual initiation and post onset behaviors differently. Existing evidence of delayed sexual onset for immigrant youth (Goldberg et

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al. 2013; Greenman and Xie 2008; Harris 1999), and lower contraceptive use among the sexually active (Manlove et al. 2013; McDonald et al. 2009), suggests that if a lower risk of births among immigrant teens is observed, it is likely to primarily reflect timing of sexual debut. However, as noted above, prior work has been of limited scope and has mostly ignored age at migration.

DATA AND METHODS

To address questions about nativity variations in teen childbearing, I use data from Waves 1-4 of Add Health, a nationally representative longitudinal study that follows a cohort of US adolescents enrolled in grades 7-12 in 1994-1995. A total of 20,745 youth responded to an in-home interview in 1994/1995; of these, 14,738 were re-interviewed at Wave II, 15,170 at Wave III, and 15,701 at Wave IV. In addition to data from the four waves of in-home interviews, I also use 1990 census data linked to respondents' Wave I addresses.[1] Of the 10,430 female respondents interviewed at Wave I, I restrict the analyses to the 9,634 adolescent girls with valid sampling weights. I also exclude 12 girls missing information on timing of first birth, and 1,219 missing data on independent variables of interest.[2] The final analytic sample thus consists of 8,416 individuals. To account for sampling design, I weight all descriptive and multivariate analyses and adjust standard errors for school-level clustering using *svy* commands in Stata 12.1 (Chen and Chantala 2013).

Measures

First birth and sexual onset. I measure timing of first birth and first sex using histories collected at each study wave.[3] Approximately 16% of adolescent girls in the sample gave birth before age 20, and over three-quarters initiated sexual activity by the same age.

Context of socialization. I operationalize context of socialization using measures of generation (first, second, and third plus), age at migration (before or after age 10), and the teen fertility rate in respondents' country of birth. Table 1 shows that 10% of girls in the analytic sample are second generation, 4% are first generation and migrated before age 10, and 2% migrated after age 10. To measure the teen fertility rate in respondents' country of birth, I use World Fertility Data provided by the United Nations (2013) for the period around 1995.

Family protection. I measure family structure in six categories: residence with both biological parents, with two adults (one or both of whom are step-, foster, or adoptive parents), with only a mother, with only a father, and "other" (often residence with grandparents). Based on prior research, I generate scales of family relationship quality and parental supervision (Bearman and Bruckner 2001; King and Harris 2007; Manning et al. 2005). I also measure respondent perceptions of how disappointed their parents would be if they did not graduate from college.

Context of reception. I construct neighborhood measures from Wave I survey items as well as linked census tract level data from the 1990 census. Based on prior research, I generate scales that tap into three dimensions of neighborhoods: immigrant concentration, concentrated poverty, and social cohesion (Browning et al. 2004; Sampson et al. 1997; South and Baumer 2000).

Controls. I measure respondent race/ethnicity with eight categories: non-Hispanic white, non-Hispanic black, non-Hispanic East Asian, non-Hispanic Filipino, non-Hispanic other Asian, non-Hispanic other, Mexican, and other Hispanic. I also control for the highest level of parental

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[1] I also use information collected from parents at Wave I, but do so only when youth reports are not available, as not having a parent interview was more common for immigrant youth. Twenty-five percent of foreign-born youth had no parent interview, compared with 15% for second generation youth and 12% for youth with US-born parents.

[2] Preliminary analyses of missing data suggest that any biases from these exclusions are minimal. Nonetheless, if further robustness checks reveal bias, I will consider carrying out multiple imputation.

[3] To minimize telescoping in retrospective reports, I use the timing reported by the participant in the earliest wave that she endorsed having experienced the event (Carlson et al. 2014; Harden et al. 2008).

education, several measures of school attachment, respondent marital status (lagged), age at the Wave I interview, and age at menarche.[4]

Analytic Strategy

I estimate the risk of first birth in a given person-month using piecewise exponential survival models. Survival methods explicitly incorporate right-censored cases and allow for inclusion of time-varying covariates to ensure appropriate temporal ordering. Respondents are considered at risk of a teen birth from age 10 up to the month before their 20th birthday. I censor respondents when they give birth for the first time, drop out of the study, or turn 20, whichever comes first.

Piecewise exponential survival models assume that the baseline hazards are constant within predetermined intervals. I split each individual's history into 11 episodes, choosing the cutpoints based on the shape of the estimated hazard function given in Figure 1.[5] Intervals are shorter in periods when the hazard is changing more rapidly. The preliminary results presented below are robust to alternative specifications of the cutpoints. I include dummy variables representing the risk of childbearing in each particular interval in the regression models. Letting the index $s = 1,\ldots, 11$ denote the intervals, I specify the following models:

$$\ln\{h(t|\mathbf{d}_{si})\} = \propto_1 d_{1si} + \propto_2 d_{2si} + \cdots + \propto_{11} d_{11si} + \beta_1 \mathbf{X}_1 + \cdots + \beta_k \mathbf{X}_k$$

where $\mathbf{d}_{si} = (d_{1si}, \ldots, d_{11si})$ are dummy variables for intervals 1 to 11 and $\mathbf{X} = (x_1, \ldots x_k)$ is a given covariate vector. The baseline hazard $h_0(t) = \exp(\alpha_1 d_{1si} + \ldots + \alpha_{11} d_{11si})$ is the hazard when the covariates take the value zero; the covariates shift the baseline hazard upward or downward. I first examine the risk of first birth from age 10. I then re-estimate the same models beginning the risk period at the time of sexual onset, which restricts the sample to person-months in which the adolescents are sexually experienced (Landale and Hauan 1996).

PRELIMINARY RESULTS

Characteristics of Youth with Migration Backgrounds

Descriptive statistics (Table 1) show that adolescent girls with migration backgrounds possess characteristics that place them at both lower and higher risk for teen birth than their counterparts with native-born parents. All groups with migration backgrounds have lower parental education compared to the third plus generation, and a smaller share are non-Hispanic White; they also reside in neighborhoods with greater social cohesion and higher concentrations of immigrants, and initiate sexual activity later. On average, second generation girls are more detached from school than their native counterparts, but have more protective family influences. Foreign-born girls who migrated before age 10 exhibit less problem behavior at school than native girls, and perceive higher parental educational aspirations. Girls who migrated in adolescence hail from countries with the highest adolescent fertility rates, and a larger share reside in "other" family structures than any other group; however, they also experience the closest family supervision.

Bivariate Relationship between Migration Background and Hazard of First Birth

Figures 1 and 2 graph estimated hazards of first sex, smoothed with an Epanechnikov kernel function and adjusted near the boundaries. In Figure 1, the hazard rate rises rapidly between approximately ages 15 and 18, before falling. While the shapes of the hazard curves are similar for all four migration status groups (Figure 2), the hazards are highest at most ages for third plus generation girls and lowest for first generation girls who migrated after the start of adolescence,

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[4] In separate analyses, I included a scale of religiosity. Because religiosity was never significantly associated with the risk of first birth, and because over 500 cases did not report on it, I do not include it in the models presented.

[5] The hazard function represents the probability that a first birth occurs in a given interval, conditional upon the subject having not given birth before the beginning of the interval, divided by the width of the interval (Cleves et al. 2010).

with some overlap between the other two groups. A Cox test for the equality of survivor functions rejects the null hypothesis that the survivor functions of the four groups are the same (p<0.01). Overall, the hazard estimates support the idea that immigrant adolescents have a lower risk of adolescent birth, with variation according to generation and lifecycle timing of migration.

Multivariate Analysis

Preliminary multivariate analyses of the transition to first birth (Table 2) also show lower risk of teen childbearing among girls with migration backgrounds. In Model 1, the risk of a first birth for second generation and first generation adolescent girls is about 24% and 26% lower, respectively, than that of third plus generation girls. Model 2 indicates that the lower risk faced by foreign-born girls does not differ by age at migration.[6] The adolescent birth rate in respondents' country of birth is also not significantly associated with teens' own risk of childbearing. Together, these results suggest that context of socialization is not a primary mechanism for the lower risk of first birth observed among adolescent girls born outside the United States.

Model 3 suggests that the family traits of immigrant youth, on the other hand, are protective against teen childbearing, at least for second generation girls and first generation girls that migrate before age 10. With the addition of family measures, the hazard ratios increase and diminish in significance for both of these groups. That the family characteristics of first generation girls arriving after age 10 are less protective is consistent with the descriptive finding that this group is more likely to live in family structures consisting of no biological parent (Table 1).

Results in the last model of Table 2 (Model 4) underscore the importance of context of reception in shielding immigrant youth from teen childbearing. In Model 4, all the effects of migration background are attenuated. Because immigrant and native teens did not differ with respect to neighborhood poverty (Table 1), the neighborhood-level protection afforded to girls with migration backgrounds appears to arise from social cohesion and high immigrant concentration.

Finally, to assess the more proximate determinants of variation by migration background, I re-estimate the models in Table 2, redefining the risk of first birth to include only person-months after first sex. The most striking finding from Table 3 is that, among the sexually active, foreign-born teens that arrived after age 10 do not have significantly different hazards of childbearing than the third plus generation (Model 2). Similar to the findings presented in Table 2, sexually active second generation girls and first generation girls who migrated before age 10 face a lower hazard of first birth than sexually active natives, with family and neighborhood factors providing explanatory power for observed differences. Thus, context of socialization appears to be an important factor in explaining the risk of teen childbearing *subsequent to sexual onset*, with US socialization contributing to a greater separation between sexual behavior and reproduction.

Next Steps

In the full paper, I will examine interactions of the immigrant generation variables with the race/ethnicity variables. I will also investigate whether the effects of the explanatory variables vary over time by interacting the duration variables with the key independent variables, and will also conduct further checks to assess whether multiple imputation of missing data is warranted. Finally, because the Add Health sample is limited to teens in school at Wave I, and immigrant youth of some population groups are more likely to drop out of school than the general population (Crosnoe and López Turley 2011), I will conduct robustness checks where possible using data from the 1997 National Longitudinal Study of Youth (NLSY97). The NLSY97 was administered over the same general time period as Add Health, and is a population-based, rather than school-based, sample.

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[6] Separate tests confirm that the hazard ratios of the two first generation groups are not significantly different.

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Table 1. Descriptive statistics of independent variables by migration background (percentages unless otherwise noted)

Characteristic	Total	First gen, arrived age 10+	First gen, arrived < age10	Second gen	Third + gen
Context of socialization					
Immigrant generation/age at migration					
Third plus generation	84.00				
Second generation	9.63				
First generation, arrived in U.S. < age 10	4.43				
First generation, arrived in U.S. age 10+	1.93				
Mean adolescent fertility rate in birth country [a]	57.35 (9.97)	67.94 (47.23)	60.07 (44.37)	57.00 (0.00)	57.00 (0.00)
Sexual activity					
First sex age 16 or below [a,b,c]	56.14	27.23	38.47	49.30	58.48
First sex age 19 or below [a,b,c]	81.94	54.71	70.18	77.15	83.72
Family protections					
Family structure					
2 biological parents [c]	55.60	51.97	59.14	63.31	54.62
2 parents [c]	17.15	16.46	15.46	12.78	17.76
Single mother	21.67	17.18	19.60	19.09	22.18
Single father	2.30	2.86	2.56	1.76	2.34
Other [a]	3.27	11.53	3.24	3.06	3.11
Quality of family relationship (mean)	0.00 (0.99)	0.11 (1.50)	-0.01 (1.23)	-0.07 (1.14)	0.01 (0.95)
Parental supervision (mean) [a,c]	1.64 (1.33)	2.00 (2.11)	1.85 (1.57)	1.81 (1.62)	1.61 (1.26)
High parental educational aspirations [b]	55.67	63.61	65.14	58.64	54.65
Neighborhood/context of reception					
Immigrant concentration (mean) [a,b,c]	-0.22 (0.75)	1.03 (2.14)	0.87 (1.72)	0.37 (1.53)	-0.37 (0.33)
Concentrated poverty (mean)	-0.05 (0.99)	0.01 (1.00)	0.04 (0.95)	-0.07 (1.13)	-0.05 (0.96)
Social cohesion (mean) [a,b,c]	0.02 (1.03)	0.67 (1.52)	0.29 (1.22)	0.12 (1.27)	-0.02 (0.97)
Socio-demographic controls					
Age at first interview (mean) [a]	15.31 (1.79)	16.71 (2.08)	15.38 (2.04)	15.29 (2.18)	15.27 (1.71)
Race/ethnicity					
Non-Hispanic White [a,b,c]	68.47	6.70	18.27	35.02	76.37
Non-Hispanic Black [a,b,c]	15.40	3.51	4.02	7.12	17.22
Non-Hispanic East Asian [a,b,c]	0.96	8.13	8.51	2.34	0.24
Non-Hispanic Filipino [a,b,c]	1.23	13.49	8.59	4.59	0.17
Non-Hispanic Other Asian [a,b,c]	1.17	9.34	10.17	4.74	0.09
Non-Hispanic Other [a,b,c]	1.50	5.58	4.16	3.18	1.07
Mexican [a,b,c]	6.49	26.68	22.62	22.82	3.29
Other Hispanic [a,b,c]	4.79	26.57	23.65	20.09	1.54
Parental education					
Less than high school [a,b,c]	12.81	43.19	31.26	24.69	9.77
High school diploma or GED [a,b,c]	31.50	16.02	17.87	23.80	33.45
More than high school [a,c]	55.70	40.79	50.86	51.51	56.78

High expectation of attending college [c]	61.40	53.34	56.12	55.82	62.50
Alienation from school (mean) [c]	0.00 (1.04)	0.00 (1.14)	-0.03 (1.00)	0.13 (1.26)	-0.02 (1.00)
Problem behavior at school (mean) [b]	-0.11 (0.95)	-0.27 (1.41)	-0.34 (1.00)	-0.18 (1.09)	-0.09 (0.91)
Married before age 20	10.08	11.59	9.23	9.87	10.12
Age at menarche (mean)	12.20 (1.41)	12.48 (2.56)	12.06 (1.65)	12.16 (1.66)	12.21 (1.34)
N respondents	**8,416**	**266**	**464**	**1,152**	**6,534**

Source: National Longitudinal Study of Adolescent Health (Add Health)

Notes: Ns are unweighted; means and percentages are weighted to adjust for sample design. Standard deviations are in parentheses below means.

[a] Significant difference between first generation arrived 10+ and third plus generation (p<0.05)

[b] Significant difference between first generation arrived before 10 and third plus generation (p<0.05)

[c] Significant difference between second generation and third plus generation (p<0.05)

Table 2. Hazard ratios from piecewise exponential survival models predicting first birth (Exposure period: age 10 through 19)

	Baseline: Model 1			Context of Socialization: Model 2			Family Protection: Model 3			Context of Reception: Model 4		
	HR		SE	HR		SE	HR		SE	HR		SE
Immigrant generation (ref: 3rd + gen)												
Second generation	0.770	**	(0.072)									
First generation	0.748	*	(0.088)									
Context of socialization												
Immigrant generation (ref: 3rd + gen)												
Second generation				0.773	**	(0.072)	0.798	*	(0.075)	0.861		(0.079)
First generation, arrived < age 10				0.735	*	(0.109)	0.753	†	(0.112)	0.859		(0.126)
First generation, arrived age 10+				0.721	*	(0.099)	0.726	*	(0.103)	0.844		(0.123)
Adolescent fertility rate in birth country				1.002		(0.002)	1.002		(0.003)	1.004		(0.003)
Family protections												
Family structure (ref: 2 bio parents)												
2 parents							1.317	***	(0.060)	1.327	***	(0.060)
Single mother							1.248	***	(0.057)	1.238	***	(0.057)
Single father							1.171	†	(0.111)	1.169		(0.111)
Other							1.552	***	(0.165)	1.549	***	(0.164)
Quality of family relationship							0.943	**	(0.020)	0.942	**	(0.020)
Parental supervision							1.006		(0.016)	1.001		(0.015)
High parental educational aspirations							0.971		(0.036)	0.979		(0.036)
Neighborhood/context of reception												
Immigrant concentration										0.850	***	(0.035)
Concentrated poverty										1.125	***	(0.026)
Social cohesion										0.948	**	(0.017)
Socio-demographic controls												
Months since age 10 (ref: 72-77)												
0-49	0.010	***	(0.005)	0.010	***	(0.005)	0.010	***	(0.005)	0.010	***	(0.005)
50-59	0.267	***	(0.070)	0.267	***	(0.070)	0.267	***	(0.070)	0.267	***	(0.070)
60-65	0.361	**	(0.115)	0.361	**	(0.115)	0.361	**	(0.115)	0.361	**	(0.115)
66-71	0.846		(0.201)	0.846		(0.201)	0.845		(0.200)	0.845		(0.200)
78-83	1.562	**	(0.246)	1.562	**	(0.246)	1.563	**	(0.247)	1.563	**	(0.247)
84-89	2.021	**	(0.438)	2.021	**	(0.438)	2.025	**	(0.439)	2.027	**	(0.439)
90-95	2.519	***	(0.489)	2.519	***	(0.489)	2.527	***	(0.491)	2.530	***	(0.491)

	Model 1			Model 2			Model 3			Model 4		
96-103	2.898	***	(0.523)	2.898	***	(0.523)	2.912	***	(0.525)	2.918	***	(0.526)
104-111	3.542	***	(0.612)	3.542	***	(0.612)	3.569	***	(0.615)	3.582	***	(0.616)
112-119	46.057	***	(8.396)	46.058	***	(8.395)	46.481	***	(8.444)	46.742	***	(8.486)
Age at Wave 1 (mean)	1.062	***	(0.014)	1.062	***	(0.014)	1.056	***	(0.015)	1.059	***	(0.014)
Race/ethnicity (ref: non-Hisp White)												
Non-Hispanic Black	1.355	***	(0.091)	1.355	***	(0.091)	1.294	***	(0.083)	1.101		(0.079)
Non-Hispanic East Asian	0.374	**	(0.121)	0.396	**	(0.131)	0.415	*	(0.139)	0.450	*	(0.153)
Non-Hispanic Filipino	1.155		(0.257)	1.183		(0.270)	1.166		(0.280)	1.332		(0.319)
Non-Hispanic Other Asian	1.000		(0.166)	1.026		(0.187)	1.022		(0.194)	0.981		(0.185)
Non-Hispanic Other	1.160		(0.182)	1.165		(0.183)	1.135		(0.173)	1.095		(0.158)
Mexican	1.286	*	(0.124)	1.276	*	(0.122)	1.296	**	(0.117)	1.384	**	(0.127)
Other Hispanic	1.059		(0.106)	1.035		(0.101)	1.012		(0.099)	1.153		(0.128)
Parental education (ref: > high school)												
Less than high school	1.521	***	(0.090)	1.516	***	(0.090)	1.421	***	(0.086)	1.320	***	(0.082)
High school diploma or GED	1.437	***	(0.056)	1.437	***	(0.056)	1.405	***	(0.054)	1.360	***	(0.051)
High expectation of attending college	0.842	***	(0.036)	0.842	***	(0.035)	0.870	**	(0.038)	0.880	**	(0.039)
Alienation from school	1.031		(0.018)	1.031		(0.018)	1.011		(0.019)	1.017		(0.019)
Problem behavior at school	1.053		(0.023)	1.053		(0.023)	1.031		(0.023)	1.037		(0.024)
Age at menarche	0.958	**	(0.013)	0.958	**	(0.014)	0.963	**	(0.014)	0.963	**	(0.013)
Married	2.394	***	(0.203)	2.394	***	(0.203)	2.386	***	(0.201)	2.349	***	(0.192)
Constant	0.001	***	(0.000)	0.001	***	(0.000)	0.001	***	(0.000)	0.001	***	(0.000)

† p<.1; * p<.05; ** p< .01; *** p<.001

Table 3. Hazard ratios from piecewise exponential survival models predicting first birth
 (Exposure period: first sex through age 19)

	Baseline: Model 1			Context of Socialization: Model 2			Family Protection: Model 3			Context of Reception: Model 4		
	HR		SE	HR		SE	HR		SE	HR		SE
Immigrant generation *(ref: 3rd + gen)*												
Second generation	0.790	*	(0.071)									
First generation	0.782	†	(0.097)									
Context of socialization												
Immigrant generation (ref: 3rd + gen)												
Second generation				0.794	*	(0.071)	0.817	*	(0.073)	0.884		(0.077)
First generation, arrived < age 10				0.733	*	(0.113)	0.753	†	(0.116)	0.857		(0.127)
First generation, arrived age 10+				0.878		(0.132)	0.887		(0.132)	1.027		(0.156)
Adolescent fertility rate in birth country				1.001		(0.003)	1.002		(0.003)	1.004		(0.003)
Family protections												
Family structure (ref: 2 bio parents)												
2 parents							1.219	***	(0.052)	1.226	***	(0.052)
Single mother							1.180	**	(0.055)	1.170	**	(0.054)
Single father							1.083		(0.096)	1.078		(0.095)
Other							1.475	***	(0.150)	1.463	***	(0.148)
Quality of family relationship							0.971		(0.021)	0.969		(0.021)
Parental supervision							1.019		(0.015)	1.015		(0.014)
High parental educational aspirations							0.967		(0.038)	0.976		(0.039)
Neighborhood/context of reception												
Immigrant concentration										0.841	***	(0.039)
Concentrated poverty										1.106	***	(0.024)
Social cohesion										0.965	*	(0.017)
Socio-demographic controls												
Months since age 10 (ref: 72-77)												
0-49	0.080	***	(0.043)	0.080	***	(0.043)	0.078	***	(0.042)	0.077	***	(0.042)
50-59	0.578	*	(0.151)	0.578	*	(0.151)	0.572	*	(0.150)	0.568	*	(0.148)
60-65	0.501	*	(0.161)	0.501	*	(0.161)	0.499	*	(0.160)	0.498	*	(0.160)
66-71	1.097		(0.265)	1.098		(0.265)	1.093		(0.264)	1.091		(0.264)
78-83	1.602	**	(0.253)	1.602	**	(0.253)	1.604	**	(0.254)	1.605	**	(0.254)
84-89	1.706	*	(0.371)	1.706	*	(0.371)	1.711	*	(0.372)	1.713	*	(0.373)
90-95	2.126	***	(0.411)	2.126	***	(0.411)	2.135	***	(0.413)	2.139	***	(0.414)

|	Model 1			Model 2			Model 3			Model 4		
96-103	2.193	***	(0.394)	2.192	***	(0.394)	2.210	***	(0.397)	2.218	***	(0.399)
104-111	2.600	***	(0.443)	2.599	***	(0.443)	2.630	***	(0.446)	2.645	***	(0.449)
112-119	30.011	***	(5.358)	30.002	***	(5.357)	30.422	***	(5.413)	30.662	***	(5.461)
Age at Wave 1 (mean)	1.055	***	(0.014)	1.054	***	(0.014)	1.054	***	(0.015)	1.057	***	(0.015)
Race/ethnicity (ref: non-Hisp White)												
Non-Hispanic Black	1.291	***	(0.081)	1.291	***	(0.081)	1.240	**	(0.076)	1.084		(0.075)
Non-Hispanic East Asian	0.301	*	(0.152)	0.313	*	(0.154)	0.325	*	(0.161)	0.351	*	(0.177)
Non-Hispanic Filipino	1.265		(0.217)	1.271		(0.223)	1.251		(0.233)	1.431	†	(0.262)
Non-Hispanic Other Asian	0.954		(0.168)	0.984		(0.189)	0.962		(0.191)	0.913		(0.186)
Non-Hispanic Other	1.137		(0.170)	1.137		(0.170)	1.088		(0.161)	1.038		(0.148)
Mexican	1.415	***	(0.137)	1.402	**	(0.136)	1.408	***	(0.130)	1.511	***	(0.141)
Other Hispanic	1.074		(0.115)	1.052		(0.110)	1.032		(0.108)	1.216	†	(0.143)
Parental education (ref: > high school)												
Less than high school	1.396	***	(0.084)	1.390	***	(0.084)	1.314	***	(0.083)	1.239	**	(0.079)
High school diploma or GED	1.349	***	(0.052)	1.349	***	(0.052)	1.329	***	(0.051)	1.297	***	(0.047)
High expectation of attending college	0.825	***	(0.034)	0.825	***	(0.034)	0.846	***	(0.036)	0.854	***	(0.037)
Alienation from school	1.016		(0.016)	1.017		(0.016)	1.006		(0.017)	1.008		(0.018)
Problem behavior at school	1.010		(0.022)	1.010		(0.021)	1.000		(0.022)	1.004		(0.022)
Age at menarche	0.978		(0.014)	0.979		(0.014)	0.981		(0.014)	0.980		(0.014)
Married	2.152	***	(0.175)	2.147	***	(0.175)	2.148	***	(0.175)	2.115	***	(0.169)
Constant	0.001	***	(0.000)	0.001	***	(0.000)	0.001	***	(0.000)	0.001	***	(0.000)

† p<.1; * p<.05; ** p< .01; *** p<.001
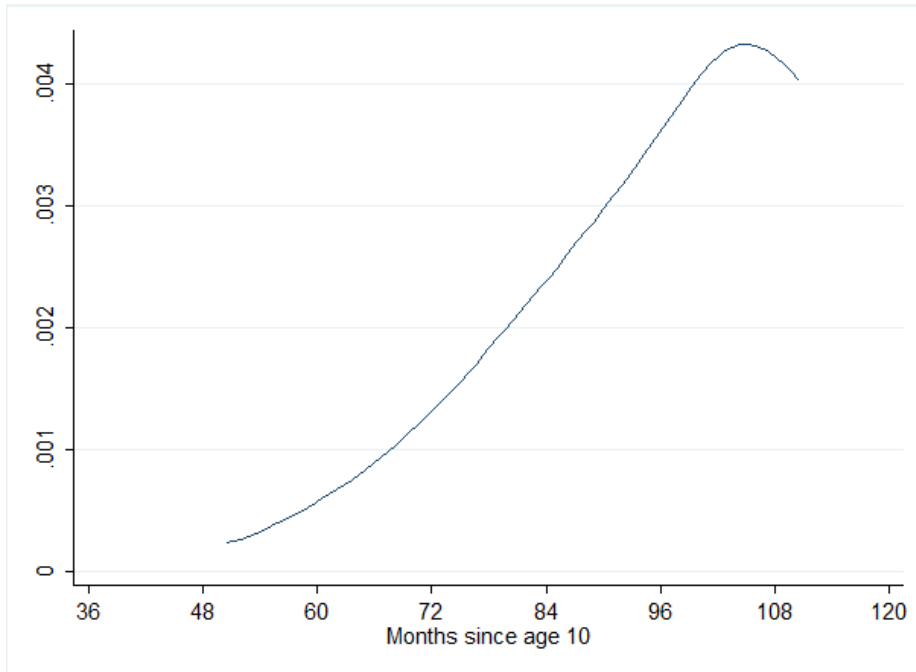
Figure 1. Hazard of first birth through age 19, young women
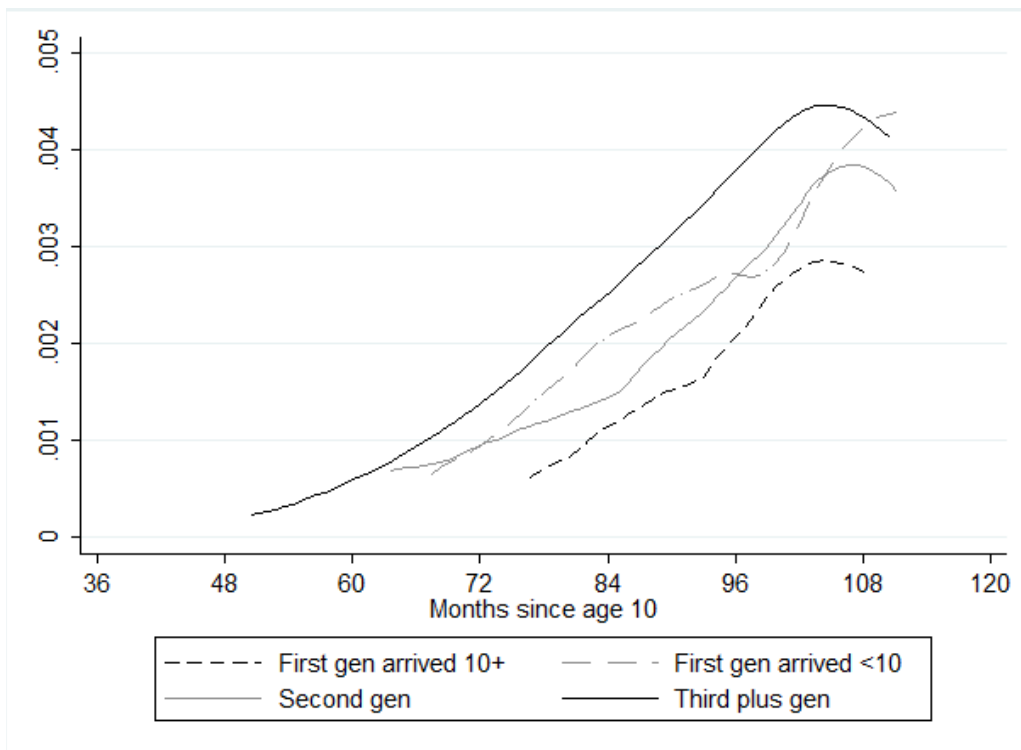

Figure 2. Hazard of first birth through age 19, young women, by migration background