Fertility Following an Unintended First Birth

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Abstract
Research on unintended fertility tends to focus on single births. This article expands previous research by examining the relationship between early unintended childbearing and subsequent fertility dynamics. Data from the 2002 National Survey of Family Growth show that 32.5% of mothers report an unintended first birth. We use event history methods to show that these women are significantly more likely than women with an intended first birth to have an unintended second birth than to either have no second birth or an intended second birth, net of socio-demographic characteristics. (Future analyses will explore more sophisticated methods for accounting for selection into unintended fertility.) An unintended first birth also increases the risk of having an unintended third birth relative to no birth or an intended birth, independent of the intendedness of the second birth. We conclude that early unintended fertility is a strong signal of high risk for subsequent unintended fertility.

Relative to levels in other western industrialized countries, unintended fertility in the U.S. is high; roughly 50% of all pregnancies and 38% of all live births are unintended (Henshaw 1998; Finer and Henshaw 2006; Barber and Emens 2006). These high levels of unintended pregnancy and childbearing in the United States are of major concern in the public health and policy arenas, largely due to the fact that unintended childbearing is negatively associated with wellbeing among women and children. Women with unintended pregnancies are less likely to obtain prenatal care, more likely to smoke during pregnancy, less likely to breastfeed, and more likely to experience depression (Barber, Axinn, and Thornton 1999; Brown and Eisenberg 1995; Hellerstedt et al.1998; Joyce, Kaestner, and Korenman 2000; Weller, Eberstein, and Bailey 1987). Children born from unintended pregnancies tend to have poorer physical and mental health and have significantly lower cognitive test scores than children born from intended pregnancies (Bustan and Coker 1994; Crissey 2005; Hummer, Hack, and Raley 2004; Marsiglio and Mott 1988; Logan, Holcome, Manlove, and Ryan 2007). As a result, the Department of Health and Human Services has declared the reduction of unintended pregnancies – and thus of unintended childbearing – a national health goal (U.S. Department of Health and Human Services 2000). Similarly, in 2007, The National Campaign to Prevent Teen Pregnancy expanded its mission to "reduce both teen pregnancy and unwanted pregnancy among young adults" and changed its name to The National Campaign to Prevent Teen and Unwanted Pregnancy (The National Campaign to Prevent Teen Pregnancy 2007).

Most research on unintended fertility is conducted at the aggregate level, describing trends in unintended fertility rates or the group-level correlates of unintended fertility (e.g. Finer and Henshaw 2006; Kissin et al. 2008). Micro-level research on the

individual-level predictors of unintended fertility tends to study births as independent events (e.g., Hayford and Guzzo 2006; Musick 2002; Speizer et al. 2004). However, recent evidence suggests a growing concentration of unintended fertility among women – in recent cohorts, women with any unintended births are having more unintended births, and a larger proportion of the unintended births in the population, than in previous cohorts (Wildsmith, Guzzo, and Hayford 2008). Building on these findings, this analysis takes a life course perspective on unintended childbearing, examining the relationship between unintended births and subsequent childbearing (both intended and unintended).

We focus on fertility trajectories after an unintended birth, using data from the 2002 National Survey of Family Growth to examine parity-specific patterns of subsequent intended and unintended childbearing. We expect that, compared to women with an intended birth, women with an unintended birth are not only more likely to go on to have a subsequent birth of any type but to have another unintended birth. This association is likely driven by both causal processes and selection into unintended fertility. Although we do not explicitly model causal relationships, we use variation by parity in the patterns of fertility after an unintended birth to assess which relationships are likely to be causal. We find that having an early unintended birth is a strong predictor of subsequent unintended fertility, even net of socio-demographic controls, and that having a first unintended birth has persistent associations with later intendedness.

Measuring unintended childbearing

Unintended childbearing is usually divided into three categories: unintended births, unwanted births, and mistimed births. Unwanted births are those for which women reported that right before they became pregnant, they did not want to have *any*

births at *any* point in the future (a number failure), while mistimed births are those identified as occurring any time earlier than desired (a timing failure).[1] Unintended births are the sum of all births identified as unwanted or mistimed. A distinction is usually made between unwanted and mistimed births because they generally reflect different concerns over the life course and by parity, and unwanted births tend to be more strongly correlated with negative outcomes than mistimed births (Santelli et al. 2003; Barber, Axinn, and Thornton 1999). Recent research has further distinguished between births that are mistimed by more or less than two years, as research has shown that the births mistimed by two or more years ("seriously mistimed") tend to have negative outcomes similar to those associated with unwanted births (Abma, Mosher, and Jones 2008; Lindberg, Finer, and Stokes-Prindle 2008). Building off this recent research, we define unintended births as those characterized as unwanted or seriously mistimed and intended births are those that are wanted or slightly mistimed.

There has been considerable debate about the validity of retrospective reports on pregnancy intendedness, as there is evidence that unintended pregnancies tend to be underreported. Many unintended pregnancies end in abortion, and abortion is known to be underreported (Jones and Kost 2006); in fact, the under-reporting of abortions is a primary reason most research on unintendedness focuses on births rather than pregnancies. In addition, there is a tendency in retrospective accounts to rationalize births and a reluctance to identify a child as unwanted (Trussell, Vaughan, and Stanford 1999; Williams, Abma, and Piccinino 1999; Musick 2002). Still, the academic community has

[1] These definitions imply that low-parity births to teenagers and young women should be unlikely to be labeled as unwanted, since most young women in the United States want to have children, usually at least two. One of the persistent puzzles of research on fertility intentions is the consistently high reported unwanted fertility among young women – on the order of one in five births to women age 15-19 in the period 1997-2001 (Chandra et al. 2005).

generally accepted the face validity of these measures (Bachrach and Newcomer 1999; Joyce, Kaestner, and Korenman 2002).

Unintended fertility and subsequent fertility

Earlier research has identified individual risk factors for unintended fertility (discussed below), but there are potentially unobserved factors associated with an unintended early birth that may also contribute to later unintended fertility. Low self-esteem, low self-efficacy, and low planfulness have all been suggested as psychological traits that may act as risk factors for unintended fertility (Brown and Eisenberg 1995). That is, having an unintended birth may be the result of a general inability or reluctance to plan for the future and to carry out plans. Some women may have little motivation to contracept if they perceive few opportunity costs to becoming pregnant; in fact, some women seem to view an unintended pregnancy as a chance to prove oneself (Edin and Kefalas 2005). According to these arguments, unintended fertility can be understood not as the outcome of a single instance of contraceptive carelessness, but rather an example of a general lack of control over one's life. To the extent that this lack of control is persistent, having an unintended birth may act as a "signal" for characteristics that are difficult to measure in large surveys.

Early unintended births may also have a causal effect on later fertility. This causal effect may take several directions, and there is likely to be variation across individuals in effects. An unintended birth may derail women's educational or employment trajectories. Reducing women's attachment to school and work may reduce the perceived costs of additional childbearing and thus increase subsequent fertility, both intended and unintended. Alternatively, the disruption caused by an unintended birth may increase

women's motivation to avoid subsequent unintended births – some women may go to great pains to avoid another "mistake." In either case, the causal effect of an unintended birth is likely to be short-term, with direct effects limited to the next birth. Long-term causal effects of unintended fertility are likely to be mediated by measurable factors such as marital and relationship status, subsequent educational attainment, and the timing of intermediate births.

Predictors of unintended fertility

The high levels of unintended fertility in the United States mean that unintended births take place to women across the spectrum of age, relationship status, and socio-economic characteristics (Barber and Emens 2006). Still, certain factors are associated with higher risks of unintended fertility. On average, births to young women are more likely to be unintended than births to older women (Logan, Holcombe, Manlove and Ryan 2007). Unmarried women report more of their births as unintended than married women, with cohabiting women falling in between (Finer and Henshaw 2006). These differences are likely due in part to differences in the acceptability of childbearing in different contexts: young women and unmarried women are less likely to want a child than older women and married women, so births in these situations are less likely to be wanted. Behavioral differences may also contribute; for example, older women and women in more stable relationships are more likely to use highly effective coitus-independent methods of contraception such as hormonal methods and IUDs (Mosher et al. 2004).

Socioeconomic and demographic characteristic have also been linked to unintended childbearing. Finer and Henshaw (2006) demonstrated that African

American women have the highest rates of unintended fertility, followed by Hispanic women and non-Hispanic white women, and that women with family incomes below the poverty level and women without a high school degree are also more likely to have an unintended birth than women with higher incomes and more education. Proposed explanations for variation in unintended fertility across socioeconomic and demographic characteristics include differential access to contraception and abortion and differential motivation to contracept associated with perceived costs and benefits of childbearing (Brown and Eisenberg 1995; Finer and Henshaw 2006).

Some characteristics associated with fertility intendedness, such as race and ethnicity, are stable; these risk factors are likely to be predictive of unintended fertility throughout the life course.. Other characteristics, such as age and marital status, change over time, but the impact of such characteristics at prior births will have persistent effects on future births – for example, women with a first birth at an early age are likely to be younger than average at a second birth as well, because of the association between first and second birth timing. Some correlation between intention status of early and later births is to be expected simply because of common factors driving early and later unintended fertility.

Hypotheses

We predict a correlation between early unintended fertility and later fertility patterns. If women with an unintended birth are poor contraceptors and lack motivation to prevent future births, they may have more births overall than women who more carefully plan their fertility. Moreover, we expect that women with an unintended first birth will be more likely than other women to report subsequent births as unintended, and

that the association between early and later intention status will hold at higher parities as well. Some of this association will be explained by socio-demographic controls, but we hypothesize that the association will persist net of individual, observable characteristics. Our analysis does not attempt to distinguish between causal and selection effects statistically. Instead, we use variation by parity in the associations between early and later unintended fertility to make substantive claims about causality.

Data and methods

We use the 2002 cycle of the National Survey of Family Growth (NSFG), a nationally representative survey of women of age 15-44 designed to measure levels and trends in fertility. The NSFG includes detailed birth and relationship histories, as well as measures of socio-demographic characteristics and family background. The 2002 cycle interviewed 7,639 women. Of these women, 4,409 were mothers, of whom 4,282 had valid, non-missing information on the intendedness and timing questions and the covariates listed below.

The NSFG is the primary national source of information on birth intendedness, having included questions regarding the wantedness of births since its inception in 1973 (London, Peterson, and Piccinino 1995; Ventura et al. 2008). The NSFG does not directly inquire whether a birth was intended or wanted. Instead, wantedness and intendedness are constructs based on responses to a series of questions asked of every birth. Wantedness is derived from the question "Right before you became pregnant, did you yourself want to have a(nother) baby at any time in the future?" A negative answer would be characterized as an unwanted birth. If a woman responds affirmatively, she is asked about the timing of the pregnancy: "So would you say you became pregnant too

soon, at about the right time, or later than you wanted?" Births that are identified as too late or at about the right time are considered wanted and intended. Births that are identified as occurring too soon are asked a follow-up question regarding the extent to which the births were too soon: "How much sooner than you wanted did you become pregnant?" Births occurring two or more years too soon are considered seriously mistimed and thus unintended (according to the definition we use here), while those occurring less than two years too soon are considered slightly mistimed and thus intended.

Analytic plan

We first describe the distribution of unintended fertility among women overall and then use discrete-time event history models to examine how the intendedness of births affects subsequent fertility. We run separate models by parity, looking at the association between first and second births, and between first, second, and third births. We also predict having a first birth by intendedness as a baseline model of sorts to examine which individuals are selected into unintended fertility. By establishing a baseline, it is possible to determine whether the same characteristics that select women into starting their fertility careers with an unintended birth continue to affect the risk of subsequent unintended fertility. The dependent variable for the analysis of first births has three categories: no birth, a wanted/slightly mistimed birth, or an unwanted/seriously mistimed birth. In the analyses predicting higher-parity births, we run two sets of models: one predicting any birth, which serves to relate intendedness to overall fertility, and one using the three-category dependent variable accounting for intendedness. We

use logistic regression in predicting any birth and multinomial logistic regression for the intendedness of the birth.

All analyses use person-months as the unit of analysis. In the model predicting the first birth, women enter the analysis when they turn twelve and exit the month of their first birth or at the time of survey if they have not had a birth. For models predicting higher-parity births, women enter the month of the preceding birth (i.e., women enter the month of their first birth for models predicting a second birth and the month of their second birth for models predicting a third birth) and leave when they have a birth or at the time of the survey if they have not had a birth.

Our key independent variables are indicators of whether prior births were unintended. For models predicting the second birth, we control for whether the first birth was unintended or intended. For third birth models, we use a set of four dummy variables distinguishing women with no unintended births, women with two unintended births, women with an unintended first birth and an intended second birth, and women with an intended first birth and an unintended second birth. We hypothesize that the association between fertility and the intendedness of the most recent birth is the best indicator of causal forces, while the associations between fertility and intendedness of earlier births capture unobserved heterogeneity.

We include a range of socioeconomic and demographic control variables. In the model predicting first birth and intendedness, we include age as a time-varying continuous variable. In the models predicting higher-parity births, we include a control for the age at last birth (less than 18, 18-19, 20-24, 25-29, and 30 or older) and a time-varying indicator of months since last birth (less than 24 months, 24-48 months, and more

than 48 months); these measures are coded as dummy variables in order to account for non-linearities in the timing of fertility. We also include race/ethnicity, family structure at age 14 (intact, stepfamily, or other), and respondent's mother's education as measures of family background. Because the 2002 cycle of the NSFG did not include a detailed education or employment history as in other cycles, we have limited time-varying measures of socioeconomic status. We use data on the month a high school degree was received to construct a time-varying measure of education (high school degree or GED/no degree). Because women in relationships are more likely to have a child, all models include a time-varying indicator of whether the woman was cohabiting or married during the month.

Results

Descriptive statistics

Table 1 displays some basic information on the distribution of unintended fertility across the life course for all women in the 2002 NSFG.[2] The average number of children a mother had in 2002 was 2.19, with an average of 0.63 unintended births. A third of all mothers reported that their first birth was unintended, while just over 40% of women with children reported having any unintended births, suggesting that the majority of women who experienced unintended fertility experienced it with their first child (and possibly others).

– Table 1 here –

Of women who have 2 (or more) births, just over half (54%) report that both their first and second births were intended. 37% (19.7% + 17%) reported an unintended first

[2] This descriptive table includes women of all ages, many of whom have not completed childbearing. We calculated similar statistics limiting the comparison to women age 40-44; conclusions were not substantively different. Our multivariate analyses control for differences in age and fertility timing.

birth, with just under half (17%) of those women reporting that their second birth was also unintended. Relatively few mothers reported that their second birth was unintended after an intended first birth. Looking at how an unintended first birth relates to subsequent fertility overall, only 13.4% of mothers who reported having an intended first birth reported any subsequent unintended births. Among women with an intended first birth, only 5.6 % of subsequent births were unintended, compared to almost three fourths of subsequent births to women with an unintended first birth. Women who begin their fertility careers with an unintended birth have significantly more children on average than women whose first child was intended, though the magnitude of the difference is modest. The average number of unintended births women have when their fertility careers begin with an unintended birth is about 1.6, suggesting that women with an initial unintended birth tend to have subsequent unintended births, while a higher-parity unintended birth after an intended first birth is fairly rare. Taken together, these differences suggest that the first birth serves as a significant factor in predicting subsequent unintended fertility. However, it is not clear to what extent the intendedness of a first birth predicts later unintended fertility net of risk factors for the first unintended birth. We consider this question in the following multivariate analyses.

Multivariate results

Table 2 shows relative risk ratios from multinomial logistic regression predicting the risk of having a first birth by planning status. Recall that these models are discrete-time event history models predicting the odds of having a birth in a given month; age, education, and relationship status are time-varying characteristics in these models. Because of the focus here on unintended fertility, this discussion will focus mostly on the

last column, which compares the risk of having an unintended first birth relative to an intended first birth. Consistent with previous research on the correlates of unintended fertility, the risk of having an unintended first birth relative to an intended first birth declines with age. There are significant race and ethnic differences as well, with black women 1.6 times as likely to have an unintended first birth than an intended first birth compared to white women (as the first two columns indicate, black women are also more likely to have a birth overall than white women). Foreign-born Hispanic women are about half as likely as white women to have an unintended first birth relative to an intended birth. In contrast, the odds of having an unintended first birth for U.S. born Hispanic women are not significantly different from those of non-Hispanic white women. There is not a statistically significant relationship between family background or educational attainment (at least as measured by high school graduation) and the intendedness of a first birth. Both cohabiting and married women are more likely to have a birth overall compared to their non-cohabiting, non-married counterparts, referred to as "single." Cohabiting women are no more likely than single women but about 3 times as likely as married women (not shown) to have an unintended first birth than an intended first birth, while married women carry a much lower risk of an unintended first birth than unmarried women (RRR=0.307).

– Table 2 here –

These models can be considered as baseline models for understanding the process of selection into an unintended first birth. They demonstrate strong associations between the intendedness of a first birth and age, race, and marital status, even controlling for other factors. Turning now to predicting higher-parity births based on the intendedness

of the first birth, Table 3 shows two sets of models. Model 1 is a standard event history model predicting any birth, and Model 2 is a multinomial model predicting the intendedness of a birth. As in Table 2, these analyses are discrete-time event history models treating high school completion and relationship status as time-varying characteristics. Here, age is modeled as two components, age at first birth (fixed) and interval since first birth.

– Table 3 here –

Model 1 shows that the intendedness of the first birth does not have a statistically significant relationship with second birth hazards. Contrary to our hypothesis, women with an unintended first birth are no more likely to have a subsequent birth than women with an intended first birth. Several other socioeconomic and relationship covariates are statistically significant and in the expected direction (age at last birth, relationship status). Including these covariates may obscure the full effects of early unintended fertility on subsequent fertility. For example, women with an unintended birth almost by definition begin childbearing earlier than desired; thus, age at first birth may more properly be considered as an outcome of early unintended fertility. If having an unintended birth limits women's relationship options, relationship status may be a mediating factor linking an unintended first birth with subsequent fertility. Unconditional models (not displayed) show that women whose first birth is unintended are significantly less likely to have a second birth (OR=.89) than women with an intended first birth. Relationship status plays an important role in mediating this effect.

Model 2, which compares having no birth, having an intended birth, and having an unintended birth, shows that an unintended birth has opposite effects on the risk of

intended and unintended second births; these opposing relationships balance each other out, as evidenced by Model 1 which shows no overall relationship between the intendedness of first births and the likelihood of having a second birth. Compared to a woman whose first birth was intended, a woman with an unintended first birth is less likely to have an intended second birth (RRR=.686) and more likely to have an unintended second birth (RRR=2.029) relative to no birth. Thus, women with an unintended first birth are nearly three times as likely to have an unintended second birth than an intended second birth relative to their counterparts who began childbearing with an intended pregnancy. Note that having an unintended first birth is a stronger predictor of having an unintended second birth – both relative to intended births and relative to no birth – than any other variable in the model, including race, age at first birth, relationship status, and education, all powerful determinants of fertility trajectories. This association is consistent with the hypothesis that there are causal effects of an early unintended birth. This analysis controls for relationship status, one of the primary possible pathways linking an early unintended birth to later fertility. However, we have only limited measures of educational attainment, and no time-varying measures of employment or earnings. It is also consistent with the notion that women whose first birth is unintended have some unobserved characteristic that also makes them more likely to have another unintended birth. Thus, there are likely unmeasured causal pathways acting through these experiences as well as unmeasured characteristics that unintended births signify.

Many factors associated with the intendedness of a second birth are similar to those associated with the intendedness of a first birth. There are some differences, however. While there is no statistically significant difference in the intendedness of *first*

births to single and cohabiting women, *second* births to cohabiting women more closely resemble those of married women. Cohabiting women are less likely than single women to have an unintended birth relative to an intended birth, and the difference between cohabiting and married women is not statistically different from zero (not shown).

Table 4 shows results for third births. Again, results from both dichotomous (any birth vs. no birth) and multinomial (no birth vs. intended birth vs. unintended birth) models are included. In the presence of socioeconomic and relationship controls, the intention status of the first two births is not predictive of the likelihood of the third birth (Model 1). Controlling for socio-demographic characteristics conceals a bivariate relationship; in models with no other variables, women who have an unintended first and second birth are, overall, more likely to have a third birth (not shown). This positive association is largely driven by the earlier age of childbearing among women whose births were not intended.

– Table 4 here –

In multinomial models, intendedness of prior births works in different and countervailing directions for the likelihood of and intendedness of a third birth (Model 2). As for second births, women with early unintended births are *more* likely to have unintended third births and *less* likely to have intended third births; similarly, the intention status of early births are the strongest predictors in the model of the intention status of the current birth. Compared to women with no unintended births, women with an unintended first birth *or* an unintended second birth have a higher risk of an unintended third birth relative to an intended third birth. The strongest association with subsequent fertility occurs among women whose first two births were both unintended –

compared to women with no unintended births, these women are more than 4 times more likely to have an unintended vs. intended third birth.

The continued relationship between the intention status of the first birth and higher-parity fertility suggests an important role of unobserved heterogeneity in explaining these relationships. If having an unintended first birth had a purely causal effect on subsequent birth timing or intendedness, this causal effect would be mediated in third birth models controlling for the age and intention status of second birth. Instead, the intention status of first birth appears to capture some characteristic of women's reproductive behavior or attitudes that has continuing effects on later births. However, the relative magnitude of the coefficients for first and second births in the third birth models also points to some causal relationship. If having an unintended birth were only an indicator of some other characteristic, women with an intended first birth and an unintended second birth should resemble women with an unintended first birth and an intended second birth. The stronger relationship between the more recent birth and third birth intendedness (RRR=2.770 compared to RRR=1.789) implies some distinct relationship between recent fertility and third births.

Coefficients describing the relationship between socio-demographic characteristics and the intention status of third births are generally the same sign as coefficients predicting second births. However, the magnitudes of some coefficients are smaller, and some associations that are statistically significant in the second birth models are not statistically different from zero in the third birth model. This attenuation may be due to the smaller sample size in the third birth model. It is also possible that the

selection of women who have had a first and a second birth into the model reduces variation in the third birth models relative to the second birth models.

Conclusions and next steps

We find that the intention status of first and second births is not related to the overall risk of a subsequent birth, but having an unintended birth is associated with higher risk of an unintended birth relative to having no additional births or to having a subsequent intended birth. Having an unintended first birth is associated with unintended fertility for both second and third births, even net of mediating factors such as relationship status and subsequent fertility. This persistent relationship suggests that early unintended births may signal unmeasured characteristics predicting later fertility. However, an unintended second birth is more strongly associated than an unintended first birth with third birth intendedness, consistent with the presence of causal relationships as well.

These findings have implications for policy makers interested in preventing unintended births. Because having an unintended birth is a strong predictor of later unintended fertility, targeting resources towards women who report an earlier unintended pregnancy may be an effective prevention technique. Our results are also useful in understanding the dynamics of fertility and family formation in the United States. Early research on unintended fertility focused on unwanted births late in the childbearing career. As delayed marriage and childbearing have become more common, an increasing proportion of unintended births occur at low parities, part of which may stem from the misidentification of very early births as unwanted rather than mistimed. The need to reassess the measurement and definition of unintended fertility in light of this shift has

long been recognized (see, e.g., Klerman 2000; Santelli et al. 2003). The strong correlation between the intention status of early and later births suggests that we may need to further reorient thinking toward a conceptualization of unintended births not simply as events that occur at the extreme ends of the childbearing career, or as isolated events, but rather as markers that characterize the entirety of the childbearing career.

Subsequent analyses will attempt to distinguish more explicitly between causal and selection effects. We plan to explore a propensity score matching approach in which we will use first birth models to estimate the "propensity" to have an unintended birth and match women on this propensity. Doing so will better distinguish between those characteristics (such as age or relationship status) that are related to the risk of an unintended birth overall – and thus affect the risk of having a subsequent unintended birth independent of whether a prior birth was intended – and the causal role that a lower-parity unintended birth has on subsequent fertility and intendedness.

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Table 1. Weighted Fertility Descriptive Statistics for Mothers Aged 15-44 in the 2002 National Survey of Family Growth (sample sizes are unweighted)

Average number of children	2.19		
Average number of unintended births	0.63		
Percent with unintended first birth	32.5		
Percent with any unintended births	41.5		
Percent of all births that were unintended	28.0		
First and second birth intendedness (percent distribution)			
Neither birth intended	17.0		
First birth unintended, second birth intended	19.7		
First birth intended, second birth unintended	9.3		
Both births intended	54.0		
	Intendedness of 1st birth		
	Intended	*Unintended*	
Percent with any unintended births	13.4	-	
Average number of births	2.12	2.32	***
Average number of unintended births	0.17	1.58	***
Percent of all births that were unintended	5.6	74.7	***
Number of births	2750	1532	
Number of mothers	4282		

*p<.05 ** p<.01 *** p<0.001 Significant differences by intendedness.

Table 2. Relative Risk Ratios from Multinomial Logistic Regression Predicting Having a First Birth by Intendedness

	Intended v. no birth		Unintended v. no birth		Unintended v. intended birth	
Age (omitted=20-24 yrs old)						
Less than 18	0.290	***	0.768	**	2.649	***
18-19	0.907		2.223	***	2.452	***
25-29	1.000		0.259	***	0.258	***
30 or older	0.828	***	0.098	***		***
Race (omitted=white)						
Black	1.841	***	2.871	***	1.560	***
Foreign-born Hispanic	2.192	***	0.990		0.452	***
Native-born Hispanic	1.718	***	1.964	***	1.143	
Other	1.288	**	1.048		0.814	
Mother's education (omitted=HS/GED)						
Missing/Less than HS	1.146	**	1.247	***	1.089	
Some college	0.876	*	0.844	*	0.963	
College or more	0.840	**	0.712	***	0.847	
Family structure at 14 (omitted=intact)						
Stepfamily	1.103		1.335	***	1.211	
Other	1.158	**	1.341	***	1.158	
Had HS/GED degree	0.842	***	0.781	***	0.928	
Cohabiting during the month	6.657	***	6.138	***	0.922	
Married during the month	21.588	***	6.369	***	0.307	***
Women			7511			
Person-months			1112504			
-2 log likelihood			53109.038			

*p>.05 ** p>.01 *** p>0.001

Table 3. Relative Risk Ratios from Multinomial Logistic Regression Predicting Second Birth by Intendedness

	Any birth v. no birth		Intended v. no birth		Unintended v. no birth		Unintended v. intended birth	
Age at last birth (omitted=20-24 yrs old)								
Less than 18	1.306	***	1.259	**	1.345	**	1.068	
18-19	1.132	*	1.126		1.207		1.072	
25-29	0.985		1.041		0.655	**	0.629	**
30 or older	0.712	***	0.737	***	0.449	***	0.610	*
Race (omitted=white)								
Black	1.123	*	0.912		1.859	***	2.039	***
Foreign-born Hispanic	1.185	**	1.065		1.910	***	1.794	***
Native-born Hispanic	1.102		1.032		1.462	**	1.417	*
Other	0.952		0.793	*	1.746	**	2.203	***
Mother's education (omitted=HS/GED)								
Missing/Less than HS	1.044		1.046		1.095		1.047	
Some college	1.117	*	1.136		1.130		0.995	
College or more	1.157		1.117		1.228		1.099	
Family structure at 14 (omitted=intact)								
Stepfamily	1.060		1.062		1.303		0.971	
Other	1.055		1.018		1.120		1.100	
Had HS/GED degree	0.804	***	0.912		0.633	***	0.694	***
Cohabiting during the month	2.016	***	2.508	***	1.633	***	0.651	***
Married during the month	2.753	***	4.186	***	1.229	*	0.294	***
Months since last birth (omitted=24-48 months)								
0-23 months	0.380	***	0.301	***	0.639	***	2.958	***
More than 48 months	0.486	***	0.520	***	0.424	***	0.815	
1st birth unintended	0.955		0.686	***	2.029	***	2.958	***
Women	4287				4287			
Person-months	242919				241992			
-2 log likelihood	118483.440				31222.412			

*p>.05 ** p>.01 *** p>0.001

Table 4. Relative Risk Ratios from Multinomial Logistic Regression Predicting Third Birth, by Intendedness

	Any birth v. no birth		Intended v. no birth		Unintended v. no birth		Unintended v. intended birth	
Age at last birth (omitted=20-24)								
Less than 18	1.714	***	1.933	***	1.444	*	0.747	
18-19	1.532	***	1.600	***	1.322	*	0.827	
25-29	0.726	***	0.702	***	0.707	**	1.007	
30 or older	0.546	***	0.569	***	0.433	***	0.761	
Race (omitted=white)								
Black	1.278	**	1.080		1.651	***	1.529	**
Foreign-born Hispanic	1.118		1.146		1.176		1.026	
Native-born Hispanic	1.264	*	1.141		1.581	**	1.385	
Other	1.077		1.098		1.214		1.106	
Mother's education (omitted=HS/GED)								
Missing/Less than HS	1.266	***	1.324	**	1.193		0.901	
Some college	1.219	*	1.391	**	0.959		0.689	
College or more	1.233	*	1.425	**	0.870		0.611	*
Family structure at 14 (omitted=intact)								
Stepfamily	1.050		0.926		1.263		1.364	
Other	0.899		0.819	*	1.013		1.236	
Had HS/GED degree	0.890		0.981		0.780	*	0.795	
Cohabiting during the month	1.988	***	2.464	***	1.616	***	0.656	*
Married during the month	1.605	***	2.031	***	1.199		0.590	**
Months since last birth (omitted=24-48 mos)								
0-23 months	0.486	***	0.350	***	0.799	*	2.291	***
More than 48 months	0.399	***	0.412	***	0.355	***	0.860	
Prior birth intendedness (omitted=1st & 2nd birth intended)								
1st birth unintended, 2nd birth unintended	0.994		0.550	***	2.398	***	4.358	***
1st birth unintended, 2nd birth intended	0.920		0.819	*	1.465	**	1.789	***
1st birth intended, 2nd birth unintended	0.907		0.647	**	1.793	***	2.770	***
Women	2854				2854			
Person-months	189052				189052			
-2 log likelihood	14275.448				15215.585			

*p>.05 ** p>.01 *** p>0.001