The Association between Intendedness of First Birth and Completed Family Size: Trends and Patterns in the United States, 1973-2019

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Short abstract: The conditions under which people have first births set the trajectory for future childbearing and family formation. In particular, women who have an unintended first birth may have systematically different patterns of childbearing and family formation than women with an intended first birth, resulting in different levels of completed fertility. In this project, we examine differences in completed childbearing based on intendedness of first births in the United States. We draw on data from the National Surveys of Family Growth, nationally-representative repeated cross-sectional surveys, to examine trends over time in these associations between 1973 and 2019. Preliminary descriptive results suggest that women with an unintended first birth have higher completed fertility than women with an intended first birth. The completed paper will examine the contribution of mechanisms related to conditions of unintended births (such as an earlier age at first birth and lower proportions of births in stable unions) to these associations. We will also consider the potential role of selection factors contributing to unintended fertility—such as fecundability, access to contraception, or childbearing orientations—in explaining this association.

Extended abstract: The conditions under which people have first births set the trajectory for future childbearing and family formation. For instance, having an unintended first birth is associated with an increased likelihood of reporting future births as unintended (Guzzo and Hayford 2011; Rajan et al. 2017). In addition, unintended births are associated with higher use of the most effective contraceptive methods after the birth (Guzzo, Eickmeyer, and Hayford 2018), an increased risk of relationship instability (Guzzo and Hayford 2012; Stykes and Guzzo 2020), and higher levels of maternal depression (Abajobir et al. 2016).

Given these associations, it might be expected that the completed family size of those who begin childbearing with an unintended first birth differs from people whose first birth is intended. The mechanisms listed above may contribute to differences in completed fertility. It is also possible that characteristics associated with selection in to having an unintended first birth, such as higher fecundability or a more positive orientation toward childbearing, influence subsequent childbearing. However, the relationship between the intendedness of first birth and completed fertility has not been documented.

In this analysis, we describe the association between the intendedness of first births and completed fertility in the United States. Because the distribution of unintended births has shifted over time in the U.S. in ways that might affect this association (Hayford and Guzzo 2016), we further describe change over time in these patterns. We draw on data from multiple cycles of the National Survey of Family Growth, a repeated cross-sectional survey that provides full childbearing histories for a nationally representative sample of women of reproductive age, to trace these patterns over nearly fifty years, from 1973 to 2019. In this extended abstract, we outline our conceptual framework and provide preliminary bivariate

tabulations, focusing on the difference between women with intended and unintended first births. The completed paper will explore mechanisms and extend the analysis to consider women whose first births were later than desired separately from those whose first births were on time.

Early unintended births and subsequent fertility

Our examination of the relationship between the intendedness of first births and later childbearing is inspired by holistic approaches to studying childbearing as part of "reproductive careers" (Johnson et al. 2018) or "childbearing biographies" (Thomeer et al. 2022). These approaches take a life course perspective on fertility, recognizing that the timing, sequencing, and context of births (as well as other reproductive events such as miscarriages, abortions, and spells of infertility) are interdependent. Understanding the causes and consequences of particular fertility behaviors requires a consideration of the longer reproductive career, not only individual births. In this analysis, we seek to understand whether reproductive careers that begin with an unintended birth have other distinctive elements.

We do not attempt to isolate a causal effect of an unintended first birth. Unintended births, by definition, occur to people who did not want or plan to have a child at all or at a particular context during their lives. Thus, unintended births are systematically different from intended births – they take place at younger ages on average, are more likely to happen outside of marriage or stable cohabitation, and are more likely to occur among women with incomes below the poverty line (Mosher, Jones, and Abma 2012). These differences are part of the mechanisms explaining subsequent trajectories, rather than confounders to be controlled away. Our analysis will present both adjusted and unadjusted comparisons in order to assess the salience of these mechanisms.

Our arguments will also consider how selection processes play into subsequent childbearing trajectories. The proximate determinants of unintended births are contraceptive failure, non-use of contraception or use of less effective methods, and non-use of abortion. The more distal determinants include a wide range of factors such as barriers to contraceptive access, lack of reproductive health knowledge, relationship dynamics and contraceptive coercion, efficacy, stigma related to contraception and abortion, ambivalence about childbearing goals, and others (Guzzo and Hayford 2020). Many of these factors are likely to persist over the reproductive life course, shaping both first births and subsequent childbearing.

We expect that the link between an early unintended birth and completed fertility has changed over time. The U.S. has persistently high levels of unintended fertility relative to its peer nations, but both levels and distributions of unintended births have evolved over the course of the 20th and 21st centuries (Hayford and Guzzo 2016; Maddow-Zimet and Kost 2021). Over this time period, there have also been changes in the U.S. family and reproductive context, such as changes in union formation (rising age at marriage and rising rates of non-marriage) (Smock and Schwartz 2020), changes in sterilization rates (Hayford, Kissling, and Guzzo 2020), and changes in ideal family size (Brenan 2023). Thus, both selection processes into first births and family and reproductive behaviors following unintended births are likely to have changed.

Data and methods

Data and analytic sample. We use data from the National Survey of Family Growth, a repeated cross-sectional survey that is nationally representative of women age 15-44 in the United States. Surveys were conducted in 1973, 1976, 1982, 1988, 1995, and 2002. Starting in 2006, the NSFG moved to continuous data collection, with data released every two to four

years. We use the 2006-2010, 2011-2015, and 2015-2019 releases. (Data from 2015-2019 will be added in the completed paper and is not included in this extended abstract.) The NSFG added a sample of men in 2002 and extended the age range of the sample to 45-49 in 2015; for comparability with the earlier surveys, we limit our analysis to women up to age 44. In 1973 and 1976, the sample frame was ever-married women and never-married women with own children in their household. Women with early unintended births may have been less likely to ever marry and less likely to live with their children at the time of the survey (if older children have moved out of the household) and may thus be underrepresented in these early surveys; we interpret estimates from these surveys with caution.

Because our main outcome is completed fertility, our analytic sample consists of women age 40-44. Although birth rates among women in these age groups are increasing, they remain very low (Beaujouan 2020), and women at these ages can on average be assumed to have completed childbearing. Sample sizes range from 604 to 1601 depending on survey year; Table 1 shows the number of women included in each survey and the analytic sample size of women age 40-44.

Measures. Our primary predictor variable is the intendedness of the first birth. All NSFGs collect a full fertility history. For each reported pregnancy, women are asked whether, at the time they became pregnant, they ever wanted to have another child. If the answer is yes, they are then asked whether the pregnancy occurred at about the right time, sooner than wanted, or later than wanted. Births that took place when women wanted no more children or that took place sooner than wanted are described as "unintended." (It is not clear why the NSFG uses the term "unintended" when the question asks about desires, not intentions. We use the NSFG's term despite this inconsistency.) Births that took place at the right time or later than wanted are described as "intended." In the United States, very few first births are reported as taking place when women wanted no more children ("unwanted"). We therefore do not separate these births from earlier than wanted ("mistimed") births. In the completed paper, we will explore the possibility of separating on-time and later than wanted births.

Our primary outcome variable is completed fertility, or the total number of live births reported by the date of the survey for women age 40-44.

The NSFG asks about all pregnancies regardless of outcome. However, abortion and miscarriage are substantially underreported in the NSFG, as in all survey data. We therefore limit analysis to pregnancies that end in live birth.

In the completed paper, we will account for mechanisms that might contribute to the relationship between intendedness of first birth and completed fertility, such as age at first birth, relationship status at first birth, and stability of coresidential relationships following the first birth. We will also incorporate individual sociodemographic characteristics potentially associated with selection in to first birth, subsequent fertility, and desired family size. Relevant characteristics include education, race and ethnicity, and measures of childhood family socioeconomic status (e.g., maternal education).

Analytic approach. To show the unadjusted relationship between intendedness of first birth and completed fertility, we will calculate the mean number of live births to women with intended and unintended first births, with t-tests to assess statistical significance of the association. We will then estimate regression models to show differences adjusted for mechanisms listed above. (We will estimate either OLS models or Poisson models depending on model fit; based on previous experience analyzing these data, we expect that OLS models for completed fertility will show adequate fit and will be preferred for ease of interpretation.) All analyses will be weighted and will adjust for complex survey design.

The bivariate relationship between intendedness of first birth and completed fertility will be presented separately for each survey year to assess potential change over time in the association. Regression models will include both a control for survey year and interaction terms between survey year and intendedness of first births. We will conduct formal tests of mediation to estimate the contribution of demographic mechanisms (age at first birth, marriage and relationship stability) to the overall association between intendedness of first birth and completed family size. We will also explore the possibility of using regression-based decomposition to understand changes over time in this association.

Preliminary results

Table 2 shows preliminary descriptive results for mean completed family size (number of live births) among women with an unintended first birth and women with an intended first birth. For context, the table also shows the mean completed family size among all women in the cohort (i.e., including childless women) and the proportion of births that were intended. The analytic sample for this table is women age 40-44 at the time of the survey.

In all survey years, completed family size is higher among women with an unintended first birth than among women with an intended first birth. The magnitude of the difference varies, but is around 0.4 or 0.5 births in most surveys, with no clear time trend in the magnitude. Overall, completed family size declined substantially between the 1970s (the cohorts of women whose childbearing years took place largely during the Baby Boom) and the most recent surveys. The proportion of first births that was unintended fell during the early part of the period of study, then increased toward the later years.

Discussion and next steps

The larger completed family size among women with an unintended first birth may be because these women generally begin childbearing at an earlier age, because of persistent challenges in access to contraception that resulted in additional unintended births, because of differences in demographic characteristics of these women that are associated with higher desired family size, or some combination of these and other factors. The completed paper will explore these explanations, as well as possible countervailing mechanisms that may reduce completed fertility among women with an unintended first birth, such as greater relationship instability among women with an unintended first birth or higher levels of surgical sterilization.

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Table 1. Survey sample frames and sample sizes, women, National Surveys of Family Growth

Survey year(s)	Sample frame	N (full sample)	N (age 40-44)
1973	Ever-married women and single women with children in household, age 15-44; black women oversampled	9797	1325
1976	Ever-married women and single women with children in household, age 15-44; black women oversampled	8611	1141
1982	Women, age 15-44; black and teenage women oversampled	7969	644
1988	Women, age 15-44; black women oversampled	8450	984
1995	Women, age 15-44; black and Hispanic women oversampled	10847	1601
2002	Women, age 15-44; black, Hispanic, and teenage women oversampled	7643	990
2006-2010	Women, age 15-44; black, Hispanic, and teenage women oversampled	12279	1395
2011-2015	Women, age 15-44; black, Hispanic, and teenage women oversampled	11300	1232
2015-2019	Women, age 15-44; black, Hispanic, and teenage women oversampled	11695	1358

Table 2. Completed family size, all women and by intendedness of first birth, 1973-2019, United States

Survey year(s)	Completed family size (mean and standard error) among: *Women with unintended first birth*	*Women with intended first birth*	*All women (including childless)*	Proportion of first births intended
1973	3.7	3.3	3.2	0.68
	0.11	0.08	0.06	
1976	4.0	3.2	3.0	0.66
	0.12	0.07	0.07	
1982	3.4	2.8	2.7	0.61
	0.13	0.10	0.09	
1988	2.7	2.3	2.1	0.61
05	0.07	0.06	0.05	
1995	2.6	2.3	1.9	0.67
	0.06	0.04	0.04	
2002	2.7	2.3	2.1	0.66
	0.13	0.07	0.07	
2006-2010	2.7	2.3	2.1	0.63
	0.09	0.07	0.06	
2011-2015	2.7	2.2	2.0	0.66
	0.09	0.05	0.05	
2015-2019	2.6	2.3	2.0	0.62
	0.09	0.07	0.06	

Data: National Surveys of Family Growth. Women age 40-44 at each survey year. Weighted.