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IMPACTS OF EARLY REPRODUCTIVE ATTITUDES AND KNOWLEDGE ON ADULT UNINTENDED AND NONMARITAL FERTILITY ACROSS GENDER

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Abstract

Theory and evidence suggest strong short-term effects of attitudes toward, and knowledge about, reproduction on women's fertility. Adolescent attitudes and knowledge may also have longer-term implications for the contexts people perceive as appropriate for childbearing and their capacity to manage fertility. These processes should also apply to men, but gender differences in the meaning of sex, contraception, and reproduction may shape associations. We analyze the relationship between adolescent reproductive attitudes and knowledge and adult unintended and nonmarital fertility, using the National Longitudinal Study of Adolescent to Adult Health (N = 9,452). Adolescent reproductive attitudes, especially life course consequences of early childbearing, predict adult unintended and nonmarital fertility. Reproductive knowledge is generally unrelated to adult fertility. The direction of associations generally does not differ by gender, but associations seem to be stronger for women than men. Results suggest that fertility schemas developed during adolescence predict behavior well into adulthood.

There is a long theoretical tradition linking psychosocial characteristics to fertility behaviors. Theories widely used by demographers, such as the theory of planned behavior (TPB; see Fishbein and Ajzen, 2010; Philipov, Thévenon, Klobas, Bernardi, & Liefbroer, 2009), the traits-desires-intentions-behaviors model (TDIB; see Miller 1994, 1995; Miller, Severy, & Pasta, 2004), and the cognitive-social model (Bachrach & Morgan, 2013), argue that attitudes (general evaluations of possible positive or negative aspects of childbearing) are associated with fertility outcomes, either because they contribute to the formation of more specific plans or because they influence outcomes independently of plans. Demographers and family planning experts also recognize the importance of reproductive and contraceptive knowledge for sexual, contraceptive, and childbearing behaviors (Bongaarts, 2006; Clark, Baldwin, & Tanner, 2007; Dehlendorf et al, 2010; Rocca & Harper, 2012). In fact, one of the core models of 20th century demography, Coale's preconditions for fertility decline, articulated the joint importance of attitudes (ready, willing) and the capacity to implement these attitudes (able) (Coale, 1973).

Most previous research linking these psychosocial characteristics to reproductive behaviors focuses on a relatively short time frame, often using cross-sectional data or survey waves a few years apart. However, emerging evidence suggests that attitudes and knowledge may have persistent associations with reproductive behaviors over the long term (Garfield et al., 2016; Guzzo & Hayford, 2018; Guzzo, Hayford, & Lang, 2019; Shattuck, 2017, 2019). In particular, attitudes and knowledge developed during adolescence, a formative life course stage that establishes foundational values and skills for adulthood, may persist into adulthood and shape later reproductive behavior, including contraceptive use, birth rates, and the timing and relationship context of births. To date, previous research has not studied the impact of both

adolescent attitudes and knowledge on reproductive behavior after the transition to adulthood. Moreover, most existing research focuses on first births and excludes men.

Drawing on longitudinal data from the National Study of Adolescent to Adult Health (Add Health), we use multidimensional measures of adolescent reproductive attitudes and knowledge to predict adults' experiences of unintended and nonmarital fertility, looking at both first births and repeat births. We further consider whether the long-term associations of adolescent reproductive attitudes and knowledge with fertility vary by gender. Adolescent boys and girls receive different messages about sex, contraception, and pregnancy (Fennell, 2011; Hust, Brown, & Ladin, 2008), and there are gender differences in how people are socialized into parenting roles (Walzer, 1998). This research adds to the small but growing body of work on the long-term impacts of adolescent context as well as research studying the influences on men's childbearing behaviors.

Adolescent Attitudes, Knowledge, and Fertility

Adolescent attitudes and knowledge about reproduction predict short-term fertility behaviors (Deptula, Henry, Schoeny, & Slavik, 2006; Driscoll, Sugland, Manlove, & Papillo, 2005; Jaccard, Dodge, & Dittus, 2003; Mollborn, 2010; Schneyderman & Schwartz, 2013). This association is usually interpreted as evidence that attitudes and knowledge reflect teens' contemporaneous assessment of how having a child would fit into their lives and their access to and level of comfort with various contraceptive methods (Brückner, Martin, & Bearman, 2004; Frost, Lindberg, & Finer, 2012; Hayford, Guzzo, Kusunoki, & Barber, 2016; Ryan, Franzetta, & Manlove, 2007). A smaller body of research on adolescent attitudes and knowledge and adult behaviors suggests that these associations between attitudes, knowledge, and reproductive behavior persist over a longer time period and for a wide range of outcomes (Guzzo & Hayford,

2018; Guzzo, Hayford, & Lang, 2019; Guzzo, Hayford, Lang, Wu, Barber, & Kusunoki, 2019; Shattuck, 2019). Most of this emerging body of research has focused on relatively straightforward behavioral outcomes such as birth timing or contraceptive use. A few studies, however, have conceptualized the long-term consequences of early-life characteristics more broadly to consider how attitudes and knowledge are related to the context of childbearing. For example, Shattuck (2017) found that teen girls who said they would not consider a nonmarital birth were more likely, as adults, to have postponed their first birth and, if they had a birth, to have had a marital birth rather than a nonmarital birth. Garfield and colleagues (2016) found that teen boys' attitudes about sex and pregnancy predicted early fatherhood and whether fathers lived with their children. Further, attitudes toward life course domains that compete with childbearing, such as positive attitudes toward career and educational aspirations, are also linked to childbearing (Barber, 2001; Driscoll, Sugland, Manlove, & Papillo, 2005).

Building on these studies, we situate adolescent attitudes as part of the larger development of fertility schemas. Specifically, we suggest that adolescent attitudes tap into a broader set of ideas about childbearing (Garfield et al., 2019; Guzzo, Hayford, & Lang, 2019; Shattuck, 2017, 2019). For instance, consider the extensive research exploring how the meaning of childbearing is situated in family, neighborhood, and life course contexts (e.g., Bute & Jensen, 2010; Edin & Kefalas, 2005; Edin & Nelson, 2013; Harding, 2007; James-Hawkins & Sennott, 2015; Jensen & Bute, 2010; Mollborn, 2010, 2017). This research shows that attitudes toward childbearing are not only a concrete assessment of practical costs and benefits of childbearing at a particular point in time or under particular circumstances but represent elements of a larger system of meaning connecting childbearing with ideas about family, work, and parenting—in other words, a childbearing "schema" (Johnson-Hanks, Bachrach, Morgan, & Kohler, 2011).

These meanings are likely learned and adopted in adolescence as teenagers begin forming romantic relationships while they also begin planning for the future more concretely—for instance, deciding whether to take college prep courses or adopting more adult roles, such as getting a job. Although attitudes and values evolve as people grow up, the ideas to which children and adolescents are exposed are a formative influence on later-life beliefs (e.g., Johnson-Hanks et al. 2011; Pearce & Davis 2016; Yabiku, Axinn, & Thornton 1999). Thus, although adolescent reproductive attitudes may seem specific to teen fertility, we argue they reflect broader schema. Teens who perceive that early childbearing would be embarrassing to one's family, for example, may also feel that nonmarital childbearing is unacceptable. Teens who view birth control more favorably may be those who also view fertility as something to be planned. As such, we expect that teens' attitudes about pregnancy and birth control are predictive of adult unintended and nonmarital fertility, that is, of the meaning they assign to childbearing and the contexts in which they have children.

In this article, we also incorporate knowledge about contraception and reproduction as a set of characteristics developed in adolescence with potentially long-term consequences. Accurate knowledge about reproduction and contraception is necessary for all individuals of childbearing age to manage their reproductive behavior. Women have more than thirty years of potential fecundity, with men able to reproduce throughout most of their adult lives, yet both men and women in modern Western societies generally think families of two to three children are ideal and prefer to have children relatively closely spaced together (Organisation for Economic Co-Operation and Development, 2016; Saad, 2018). To achieve this reproductive goal, individuals need to understand the basic biology of human reproduction (such as when during the menstrual cycle women are mostly to become pregnant) and how to avoid pregnancy

(i.e., contraception). This information is usually taught during adolescence, when individuals go through puberty and become able to have children. In the U.S., however, sex ed programs vary substantially in whether they are offered, the content being offered, and the accuracy of that content; this was especially true of the 1990s, when our analytical sample was first surveyed, but remains true today (Hall, Sales, Komro, & Santelli, 2016; Lindberg, Maddow-Zimet, & Boonstra, 2016). And unfortunately, adults have few opportunities to learn more, and more accurate, information (Kottke, 2014) even as the likelihood that both their desires and risks for fertility increase as they age, form romantic relationships, and enter into normative family-building life course stages. Thus, it seems that what men and women know as adults about sex, reproduction, and contraception may differ little from what they learned as teens, and so misinformation is common (Wynn, Foster, & Trussell, 2009). This may explain why teens' adolescent reproductive knowledge predicts subsequent adult contraceptive method choice and consistency (Guzzo & Hayford, 2018; Guzzo, Hayford, Lang, Wu, Barber, & Kusunoki, 2019).

Most adolescents want to avoid childbearing in the short term, although the strength of these desires and of underlying attitudes vary substantially. In early adulthood, there is more variation in roles and statuses, as some people marry or cohabit, establish independent households, or enter full-time work while others continue schooling, live with parents or roommates, or delay coresidential relationships. Reflecting this variation, as well as variation in the contexts that people perceive as appropriate for childbearing, individuals are increasingly likely to intend to have children in the near future as they exit adolescence and enter into the adult years (Allred & Guzzo, 2018). In order to understand the evolving impacts of adolescent attitudes and knowledge, it is important to analyze not just whether births take place, but the context and intention status of these births. This leads us to our first research question:

Research Question 1: Are adolescent reproductive attitudes and knowledge associated with variation in the timing, relationship context, and intention status of births in adulthood?

In general, we expect that teens with attitudes more favorable to birth control and less favorable to early childbearing are also less likely to have both nonmarital and unintended births. Similarly, we expect those with more accurate knowledge and greater confidence about contraception to be less likely to have both nonmarital and unintended births.

Gender and Fertility Behaviors

The vast majority of fertility research has focused on women's fertility (Greene & Biddlecom, 2000); research on attitudes, knowledge, and fertility is no exception. As a result, understanding the psychosocial factors that influence men's behaviors—and whether they are similar to those that influence women's behaviors—remains a major gap in the literature. Some analyses have linked adolescent knowledge to adolescent contraceptive behaviors for both genders (e.g., Rock, Ireland, Resnick & McNeely, 2005; Ryan, Franzetta, & Manlove, 2007), but generally there is little research on adolescent boys' attitudes about childbearing. To the best of our knowledge, only Garfield et al. (2016) examined if adolescent boys' attitudes predict adult fertility, but without including women, it remains unclear whether the adolescent attitudinal and knowledge antecedents of adult fertility behaviors are similar across gender. It is certainly possible that adolescent boys and girls view pregnancy differently and have different levels of knowledge about contraception and reproduction. The greater burden of childrearing on women suggests a gendered component to opportunity costs and thus attitudes toward childbearing. Similarly, girls are more often targeted for safe sex and pregnancy prevention messages (Hust, Brown, & Ladin, 2008) and bear the primary responsibility for ensuring that contraception is used (Fennell, 2011).

As such, adolescent girls may have different reproductive attitudes and knowledge than adolescent boys.

It is equally possible that even if attitudes and knowledge are similar, they could be differentially associated with adult fertility if women weigh childbearing decisions differently than men. For instance, women are socialized about the motherhood role in ways that are unlikely to be paralleled for men and fathers due to the different societal expectations of mothers and fathers (Adamson, 2010; Allen & Hawkins, 1999; Stryker, 1987; Walzer, 1998). Men also tend to view fatherhood and partnership as part of a "package deal," probably in ways that women do not given the physiological nature of childbearing (Edin & Nelson, 2013; Schoppe-Sullivan et al., 2008; Townsend, 2002). Thus, it is unclear whether adolescent attitudes and knowledge would be associated with adult fertility behaviors like unintended and nonmarital fertility in the same way across gender.

An additional wrinkle to making comparisons of fertility behaviors across gender, however, is that the quality and accuracy of men's fertility information in survey data is questionable (Joyner et al., 2012). Young men report fewer births than would be expected, even given different age schedules of the entry into parenthood, with nonmarital births particularly under-reported. But it is possible that, conditional on reporting a birth, the associations between adolescent attitudes, knowledge, and adult fertility would nonetheless represent valid associations. It also seems likely that part of the under-reporting of young men's fertility is related to sampling issues, such that men in their teens and early 20s are more likely to be tenuously attached to homes (Kendall et al., 2005), incarcerated or institutionalized, or in the military—all statuses that limit the chances they appear in household-based surveys. As teens and young adults enter their late 20s, though, risk-taking and instability decline (Rocque, Posick,

& White, 2015), such that men may be more likely to be surveyed—and report children (Aughinbaugh & Gardecki, 2007). As such, we have our second research question:

Research Question 2: If adolescent reproductive attitudes and knowledge are associated with the timing, relationship context, and intention status of births in adulthood, does this association vary by gender?

Overall, we expect that the association between adolescent attitudes and knowledge and adult fertility will be stronger for women than for men.

Current Study

We test whether adolescent reproductive attitudes and knowledge predict fertility over the long term by focusing on two aspects of fertility. First, we examine the entrance into parenthood; the circumstances in which people have their first births may "set the stage" for a number of family-related behaviors and affect the attainment of subsequent human capital (Rajan et al., 2017; Rindfuss & St. John, 1983). In this first set of analyses, we predict first births, using discrete time event history methods in which we separately model unintended fertility and nonmarital fertility. Second, we consider the experiences of having multiple unintended or nonmarital births to test whether there are longer-term effects of adolescent reproductive attitudes and knowledge beyond the first birth. Such experiences often indicate greater disadvantage (Shreffler, Greil, Mitchell, & McQuillan, 2015), and multiple unintended or nonmarital births may also reflect a particularly high level of difficulty in managing reproductive behaviors. In the second set of analyses, we thus focus on those with at least two births and predict fertility experiences by Wave IV, combining the number of births and the context of births to identify those with multiple unintended or nonmarital births. Because men and women with two or more children by the late 20s and early 30s are a select group, we also examine whether our reproductive attitudes and

knowledge measures predict the number of children in supplementary analyses. All models are run separately by gender, and we test for differences across gender in the association between our measures of reproductive attitudes and knowledge and fertility behaviors.

We account for key socioeconomic and demographic variables associated with fertility intendedness and marital status, including age, race-ethnicity, nativity, family structure and family socioeconomic status during adolescence, and educational attainment (Finer & Zolna, 2016; Kim & Raley, 2015; Rajan et al., 2017). The rich data in Add Health also permit us to account for psychosocial characteristics linked to fertility behaviors, including religiosity, college aspirations, academic aptitude, and locus of control (Guzzo, Hayford, & Lang, 2019; Hayford & Morgan, 2008; Rajan et al., 2017), as well as exposure to sex ed (Kirby & Lepore, 2007).

Data and Methods

The analyses used the National Longitudinal Study of Adolescent to Adult Health (Add Health), a nationally representative school-based sample of adolescents surveyed in 1995 (Wave I), 1996 (Wave II), 2001-02 (Wave III), and 2007-08 (Wave IV). At Wave I, 20,743 adolescents in grades 7-12 were interviewed, including oversamples. At Wave IV, from which we drew fertility outcomes, 15,701 respondents were re-interviewed when they were ages 24-32. We restricted the sample to those with valid longitudinal weights (excluding 901 respondents, from the oversamples). The questions used to indicate reproductive attitudes and knowledge (discussed below) were only asked of adolescents aged 15 and older at Wave I, excluding 4,357 respondents. We excluded 893 respondents with pregnancies prior to Wave 1 to establish temporal ordering and dropped an additional 98 respondents with missing or inconsistent information on the dependent variables (discussed below). The sample size was comprised of

9,452 respondents (5,012 women and 4,440 men) who were 15 and older at the Wave I survey, did not have a birth prior to Wave I, and who participated in the Wave IV survey and had valid longitudinal weights.

To indicate reproductive attitudes and knowledge, we adopted the factor structures outlined in Guzzo et al. (2019). The factor structure for reproductive attitudes was comprised of 12 items and identified three underlying constructs (Table 1). The first construct, termed *feelings toward pregnancy,* assesses how respondents feel about a hypothetical pregnancy and is comprised of two items. The second construct, termed *life course consequences of early childbearing,* measures how a hypothetical pregnancy, and specifically a pregnancy during adolescence, would impact particular aspects of the respondent's life and is comprised of four items. The third construct, termed *birth control attitudes,* represents the respondent's overall orientation towards contraception and is comprised of six items; we interpret this factor as how "costly" (on a social, relational, and financial basis) it is to take steps to avoid pregnancy. Note that items were recoded so that higher scores reflect a stronger orientation toward preventing pregnancy (less favorable attitudes toward pregnancy/childbearing or more favorable attitudes toward birth control); the original coding for all reproductive attitudinal items was a five-point Likert scale of 1 = strongly agree to 5 = strongly disagree.

For reproductive knowledge, the factor structure was comprised of nine items and also identified three underlying constructs (Table 1). The first construct, termed *female reproductive biology knowledge,* represents respondents' knowledge of the physiological aspects of female reproduction and is comprised of two items. The second construct, termed *condom knowledge,* describes the respondent's overall knowledge of condoms and how to use them effectively and is comprised of four items. The final construct, termed *birth control confidence,* identifies how

confident individuals feel about their general knowledge of some specific contraceptive methods and is comprised of three items. Reproductive knowledge items were recoded so that higher scores reflect more accurate knowledge and greater confidence. The questions comprising female reproductive knowledge and condom knowledge were originally measured on a true/false basis. The questions comprising birth control confidence used the same five-point Likert scale as above to indicate agreement with the statement "You are quite knowledgeable about…" for each method, and we dichotomized these items as strongly agree/agree versus all other responses for consistency across the knowledge measures. To ensure that the factor structures could be used to explore and explain gender differences, we tested for metric invariance across gender as well as conducted the factor analyses separately by gender (not shown), and both confirmed that the factor structure held across gender (i.e., the identified constructs and their interrelationships are equally valid for men and women).

- Table 1 here -

From these two factor structures, we used the items that were identified as contributing to each factor and averaged the recoded values on the items in each factor to create variables representing the underlying constructs. In supplementary models (not shown), we used factor scores (i.e., averages of the items that are weighted based on factor loadings) rather than simple averages, and the results were substantively similar, though factor loadings produced somewhat weaker associations for measures with fewer items. We chose to use simple averages rather than factor scores because the former are more intuitive and straightforward to interpret, especially for comparisons across groups.

To investigate the context of fertility, our dependent variables were taken from Wave IV, when the analytical sample was in their late 20s and early 30s (92% were between the ages of 28

and 32). Add Health has detailed birth information for each birth, including information on intendedness and union status at birth. For each birth, intendedness was measured with the question, "Please think back to the time just before you became pregnant. Did you want to have a child then?" Responses were categorized as 'no', 'yes', and 'don't know'. We dichotomized the responses, with those answering 'yes' categorized as an intended birth, and those answering 'no' or 'don't know' as unintended.[1] For each individual, we created two measures of unintended fertility. One, for first births, we created a three-category time-varying variable: no birth, intended birth, unintended birth. Two, we created a measure indicating fertility up to Wave IV for analyzing unintended fertility among those with two or more births: only intended births, both intended and unintended births, and only unintended births. Nonmarital births were identified in a similar fashion, with two measures for each individual. Again, we created a time-varying measure of first births: no birth, marital birth, nonmarital first birth. Then, we created a measure indicating the marital status of births for those with two or more births: only marital births, both marital and nonmarital births, and only nonmarital births. In preliminary analyses, we explored disaggregating nonmarital by cohabitation status at birth as well as grouping cohabiting births with marital births (not shown). These results indicated that, in terms of the key independent variables, cohabiting births more closely resembled non-union births than marital births, and so we grouped cohabiting births with non-union births into the broader category of nonmarital.

[1] In surveys primarily designed to measure fertility, a distinction is usually made between "unwanted" births (births that took place when the respondent did not want any (more) children) and "mistimed" births (births that took place sooner than the respondent wanted). The term "unintended" is typically used as an umbrella term that includes both unwanted and mistimed births. The question wording in Add Health suggests that the concept being measured is closer to "unintended" than "unwanted," and so we use that term throughout the paper.

We also included a wide range of demographic, socioeconomic, and psychosocial measures that may be correlated with both fertility attitudes and fertility outcomes. Time-invariant demographic and socioeconomic characteristics, measured at Wave I, included race-ethnicity, nativity status, family structure at the time of the interview, and family socioeconomic status (using Bearman and Moody's (2004) operationalization, which combines information on occupation and education for both mothers and fathers to create an index for each parent ranging from 1-10 and then uses the higher of the two scores). Psychosocial variables, also time-invariant and taken from Wave I, included a dichotomous indicator of whether the respondent had sex by Wave I, whether the respondent reported ever discussing pregnancy or AIDS in school (a proxy for sex ed), religiosity (a scaled variable of four items about religious service attendance, participation in youth activities, prayer, and importance of religion, $\alpha = 0.85$), the Peabody Picture Vocabulary Test (an aptitude test), a scaled measure of the respondent's locus of control (with eight items such as "when you have a problem to solve, one of the first things you do is get as many facts about the problem as possible" and "when you get what you want, it's usually because you worked hard for it," $\alpha=0.63$), and a dichotomous indicator of whether the respondent both highly wanted and highly expected to go to college.

In the analysis predicting first births, we included a time-varying categorical indicator of age (15-19, 20-24, 25-29, and 30+), along with a measure of months since Wave I to account for exposure to childbearing; in the model predicting overall fertility at Wave IV, we used Wave IV age as simple linear variable since there was little variation in age. For education, we used a four-category measure (less than high school, high school degree or GED, Associate's degree, or Bachelor's degree or higher). Individuals who attended college but did not complete a degree are included in the high school category. In the model predicting fertility by Wave IV, we simply

used education at the time of interview, but in the event history model predicting first births, education was a time-varying measure. To construct this variable, we used data from Waves III and IV. [2]

Analyses

We begin by presenting descriptive information on experiences of unintended and nonmarital births by gender. We then show the results from multivariable discrete-time event history multinomial logistic models predicting first births by intendedness and next the results from multinomial logistic models predicting multiple experiences of unintended fertility among those with two or more births by Wave IV. Finally, we repeat this process for the analyses predicting marital status of births. All models are run separately by gender, and we compare the coefficients across gender for our key independent measures of reproductive attitudes and knowledge using Wald Chi-square tests.

The analysis of multiple unintended or nonmarital births is based on those with two or more births, which is a select group considering the age range of the sample (late 20s and early 30s). To examine whether selection occurred via our key measures of reproductive attitudes and knowledge, we conducted supplementary analyses with zero-inflated Poisson models to predict Wave IV parity. The results are shown in Appendix A. In this analysis, we see that reproductive attitudes are, in fact, related to Wave IV parity, at least for women – more negative attitudes

[2] In Wave III, respondents were asked the month and year of high school graduation. However, this information was not collected again for respondents who participated in Wave IV but who had not participated in Wave III; instead, there was only information on whether they had finished high school. For these respondents, we assigned a June graduation month for the year they would have graduated high school based on their grade at Wave I and assuming no repeated grades. An examination of the Wave III data showed that following this assumption for those that did participate in Wave III corresponded with the actual month and year of graduation in 85% of cases, with most of the remaining 15% largely due to graduation dates in May or July. Grade retention (i.e., repeating a grade) is rare in higher grades; for instance, less than 3% of ninth-graders repeated a grade in the years 1995-2010 (Warren, Hoffman, & Andrew, 2014). The Wave IV data also contained information on the year respondents obtained Associate's and Bachelor's degrees, but the month was not included. Following other work using these data (e.g., Augustine, 2016), we assigned a May graduation date to respondents with a post-secondary degree.

toward pregnancy and more favorable attitudes toward birth control at Wave I are associated with lower parity by Wave IV. Neither attitudes nor knowledge predict the number of children by Wave IV for men, though attitudes toward pregnancy just misses statistical significance at p=0.056. The coefficients for the reproductive attitudes and knowledge measures do not differ statistically across gender.

To account for the sampling design of Add Health, all analyses are weighted with Wave IV longitudinal weights using Stata 15's *svy* commands. Although we did not impute the dependent variables or the key independent variables, we used multiple imputation for missing data on the control variables using Stata's *mi* commands. Missing data was most common for the Wave I aptitude test scores, at just over 400 cases; 20 or fewer cases were imputed for other measures (Wave I: locus of control, wanting/expecting to go to college, learning about pregnancy or AIDs in school; Wave IV: education).

Results

Descriptive Results

Table 2 shows fertility information separately by gender, looking at both first births and all births by Wave IV. Given the later age profile of childbearing for men than women, it is not surprising that fewer men report having any children (and report fewer children among those with any children, not shown). More than half of men (57%) have no children whereas only 42% of women are childless.[3] Among the full sample, then, a considerably higher proportion of women than men report having an unintended first birth (25% vs. 17%) or any unintended births by

[3] These figures are similar to the National Survey of Family Growth, largely regarded as the best survey source of fertility data in the U.S. For comparison, in NSFG 2006-10 (weighted to 2008, which is when the bulk of Wave IV was interviewed), of men and women 26-32, 58% of men and 42% of women were childless (authors' calculations). This provides reassurance that Wave IV of Add Health does seem to capture and identify both mothers and fathers, at least as well as other fertility datasets.

Wave IV (29% vs. 21%). A similar pattern exists for nonmarital births, with 30% of women reporting a nonmarital first birth and 31% reporting any nonmarital births by Wave IV compared to 21% and 28%, respectively, of men. However, when considering just parents, men and women are more similar. Conditional on reporting any births, roughly 40% of men and women had an unintended first birth, and by Wave IV, about half have had at least one unintended birth. For nonmarital fertility, of those with any births, half of men and women had a nonmarital first birth or any nonmarital births by Wave IV. Among those with two or more births, only about four in ten reported having only intended births (38% and 42% for women and men, respectively), with similar proportions reporting only marital births (41% and 42% for women and men, respectively). Gender differences among all parents and among parents with two or more children are not statistically significant.

– Table 2 here –

Table 3 shows, separately by gender, the weighted descriptive statistics of the covariates in the multivariable models. We first discuss adolescent reproductive attitudes, which have a range of 1-5; recall that these are coded so that higher scores mean more negative views toward teen pregnancy and more favorable attitudes toward birth control. Both men and women had negative attitudes toward having a child during adolescence, at 4.36. Perceptions of the life course consequences of early pregnancy were also fairly negative, though women reported a statistically significant higher average (3.51) than men (3.40). Women (4.09) also had more positive adolescent attitudes toward birth control compared to men (3.86), though both were generally favorable. Turning to reproductive knowledge, adolescent female reproductive biology knowledge is measured as the number of correct answers to two true/false questions, and both men and women averaged one correct answer. For adolescent condom knowledge, which ranged

from 0-4 based on the number of correct answers to four questions, women (2.88) reported a higher average than men (2.79). Birth control confidence is measured as strongly agreeing/ agreeing that one is knowledgeable about three types of methods (thus ranging from 0-3); men (2.15) report significantly higher confidence about their knowledge than women (1.98).

– Table 3 here –

There were few other differences by gender in the analytical sample. A higher proportion of teen girls (91.4%) reported discussing pregnancy or AIDS in school than teen boys (88.2%), and more girls highly wanted and expected to attend college than boys (56.3% and 44.0%, respectively). Teen boys had statistically higher scores on the aptitude test at Wave I than girls, though the magnitude of the difference was small. By Wave IV, women had significantly greater educational attainment than men.

Multivariable Results

Next, we turn to multivariable analyses. We present parallel results for unintended and nonmarital fertility, beginning with an event history model that predicts first births and then moving to a model that predicts, among those with two or more births, whether individuals had multiple unintended or nonmarital births by Wave IV. We show the results separately by gender and control for a full set of socioeconomic and demographic covariates, though we do not show or discuss the covariates in the main text (these are available in Appendices B-E). Statistically significant differences across gender for the association between reproductive attitudes and knowledge and fertility (from Wald chi-square tests) are indicated by shading in the tables.

Table 4 shows the relative risk ratios (RRRs) from models predicting first births. For women, perceiving more life course consequences for an early pregnancy as an adolescent is associated with a greater likelihood of being childless relative to having an unintended first birth

(RRR = 1.26) and a lower likelihood of an unintended than an intended first birth (RRR = 0.83). Women who had more negative overall attitudes toward pregnancy as an adolescent are more likely to be childless than to have had an intended birth (RRR = 1.22). Birth control confidence is also significant but in an unexpected direction – women who reported greater birth control confidence in adolescence are less likely to be childless than to have had an unintended first birth (RRR = 0.91). For men, perceiving greater life course consequences of an early pregnancy during adolescence increases the likelihood of being childless relative to having an intended first birth (RRR = 1.13). For men, but not women, adolescent birth control attitudes are a significant predictor of first births and birth intendedness, with more favorable attitudes reducing the likelihood of no birth or an unintended birth relative to an intended birth (RRR = 0.88 and RRR = 0.79), respectively. Comparing across gender, perceptions of the life course consequences of an early pregnancy have a significantly different, and more negative, impact for women than men on the risk of an unintended first birth relative to an intended first birth. For men, though, more favorable birth control attitudes are more strongly, and negatively, linked to an unintended than intended birth than is the case for women.

– Table 4 here –

Fertility intendedness at Wave IV among those with two or more children is shown in Table 5, where the dependent variable has three categories: only intended births, both intended and unintended births, and only intended births. Conditional on having two or more births (see Appendix A), neither reproductive attitudes nor knowledge are generally predictive of the intendedness status of those births. Mothers with two or more children who perceived, in adolescence, greater life course consequences to early childbearing were less likely to have had both intended and unintended births relative to only intended births (RRR = 0.84); the effect is

similar for the contrast between only unintended births relative to only intended births but does not reach statistical significance (RRR = 0.81, p=.101). None of the key independent attitudinal or knowledge variables are predictive of the intendedness of men's births among fathers with two or more children. Given the relative unimportance of adolescent reproductive attitudes and knowledge for predicting multiple unintended births among adults with two or more children, it is unsurprising that there is no evidence of gender differences.

– Table 5 here –

In Table 6, the results predicting first births by marital status, using event history models, are shown. Women who had more negative overall feelings toward pregnancy as adolescents are more likely to be childless than to have had either a nonmarital or marital first birth by Wave IV (RRR = 1.15 and RRR = 1.20). Perceiving greater life course consequences of early pregnancy increase the likelihood of being childless relative to having a nonmarital first birth (RRR = 1.28) and reduce the likelihood of a nonmarital first birth than a marital first birth (RRR = 0.78). Of the reproductive knowledge measures, only birth control confidence is predictive of first births, with greater confidence reducing the likelihood of being childless relative to a nonmarital birth among women (RRR = 0.90). As with women, adolescent perceptions of greater life course consequences of early pregnancy increase men's likelihood of having no birth relative to a nonmarital birth (RRR = 1.19); the RRR for the contrast between a marital and nonmarital first is in the same direction but does not reach statistical significance. As with first birth intendedness, men's birth control attitudes during adolescence are significant predictors of having a first birth and the marital status of that birth—more favorable attitudes toward birth control reduce the likelihood of being childless and of a nonmarital birth relative to a marital birth (RRR = 0.86 and

RRR = 0.79, respectively). For first births, the effects of reproductive attitudes and knowledge do not differ in any meaningful way across gender.

– Table 6 here –

Finally, the results predicting the marital status of births among those with two or more children as of Wave IV are shown in Table 7. Unlike the earlier analysis, where there was little evidence that reproductive attitudes and knowledge predicted the intendedness of births beyond selection into having two or more births, there is evidence that both sets of adolescent measures exert an additional influence on the marital context of births beyond having multiple births. For mothers with two or more children, perceiving greater life course consequences to early childbearing during adolescence is associated with a lower risk that they had any nonmarital births, reducing the odds of having both marital and nonmarital births (RRR = 0.77) as well as only nonmarital births (RRR = 0.63) relative to only marital births. Birth control attitudes are also important, with more favorable attitudes reducing the risk that mothers with two or more births had only nonmarital births relative to either only marital births (RRR = 0.73) or both marital and nonmarital births (RRR = 0.74). For fathers with two or more births, more favorable birth control attitudes during adolescence reduce the likelihood that all their births were nonmarital relative to both marital and nonmarital (RRR = 0.62). Adolescent reproductive knowledge is unrelated to the marital status of births among women with two or more children but is relevant for fathers with two or more children. Interestingly, fathers' adolescent female reproductive biology knowledge increases the likelihood that all of their births occurred outside of marriage relative to having both marital and nonmarital births (RRR = 1.48). Greater adolescent condom knowledge during adolescence decreases the risk that fathers had only nonmarital births relative to only marital births (RRR = 0.68). Comparing across gender, the

impact of adolescent reproductive female reproductive knowledge and condom knowledge on adult nonmarital fertility experiences among those with two or more children is significantly different for mothers and fathers, affecting only fathers' nonmarital fertility risks.

– Table 7 here –

Discussion

In demography, there is a rich literature studying the link between attitudes, knowledge, and fertility. Research on attitudes tends to focus on either a limited set of direct attitudes about prospective childbearing and subsequent childbearing among adults (usually within a fairly short timespan) or on adolescent attitudes predicting adolescent fertility (again, within a fairly short timespan). As such, there is a gap in our understanding of the long-term linkages between adolescent attitudes and adult fertility. Similar, there is considerably less work on the reproductive knowledge precursors of adult fertility behaviors (at least in industrialized countries), though the links between teens' reproductive knowledge and teen fertility are fairly well-established. Much of the research linking attitudes and knowledge to fertility has examined whether individuals have children, the timing of childbearing, and, sometimes, the number of children. The context of childbearing—whether births are intended and occur within marriage—has received less attention in psychosocial research, though the socioeconomic and demographic precursors of unintended and nonmarital fertility have been studied extensively. Moreover, across both attitudinal and knowledge research and across research on both teens' and adults' fertility behaviors, nearly all studies have ignored men.

In this paper, we sought to address these oversights by utilizing recent theoretical developments in demography about fertility schemas (Johnson-Hanks, Bachrach, Morgan, & Kohler, 2011), along with our argument that adolescent reproductive knowledge independently

influences adult fertility behaviors. We asked two research questions: Do adolescent reproductive attitudes and reproductive knowledge predict the timing, context, and intention status of adult fertility, and, if so, do they do so in the same manner for men and women? Our measures of adolescent reproductive attitudes and knowledge were drawn from prior work demonstrating linkages with adult contraceptive behavior (Guzzo, Hayford, Lang, Wu, Barber, & Kusunoki, 2019), and we analyzed two key indicators of the context of fertility: the characteristics of first births and the risk of having multiple unintended/nonmarital births. We ran models separately by gender and tested for significant differences in the effects of our reproductive attitudes and knowledge measures. The many models and contrasts make it difficult to pull back and evaluate the larger story, though, so we provide a summary table (Table 8) to facilitate interpretation.

– Table 8 here –

First, do adolescent reproductive attitudes and knowledge predict adult fertility? The answer is a qualified yes. In general, over the long term, reproductive attitudes are more strongly related to fertility than reproductive knowledge, indicated by the greater number of "x" marks for attitudinal measures compared to knowledge measures in Table 8. The indicator of perceived life course consequences of early childbearing is particularly predictive of adult fertility. This measure likely taps into the notion of schemas as identifying the contexts of childbearing more so than either birth control attitudes or overall feelings toward pregnancy, as it includes indicators of the 'costs' of childbearing under less-than-desirable circumstances (i.e., my family would be embarrassed, I would have to drop out of school, etc.). In general, reproductive knowledge and confidence are only weakly predictive (at most) of fertility.

We had expected that more favorable attitudes toward birth control and less favorable attitudes toward early childbearing would decrease the likelihood of both unintended and nonmarital childbearing as adults. Putting together both the first birth analyses and the analyses of multiple births among those with two or more births, it appears that much of the influence on long-term unintended fertility from adolescent reproductive attitudes occurs in the selection into having a first birth and into having multiple births—into being a parent by Wave IV, especially a parent with two or more children—and less strongly for the intendedness of the births that do occur. Still, there is some evidence that perceiving greater life course consequences reduces the risk of unintended fertility, at least for women. For nonmarital fertility, there is more evidence of a long-term effect of adolescent reproductive attitudes, as they predict both lower risks of a nonmarital first birth relative to a marital birth as well as lower risks of multiple nonmarital births relative to only marital births. Thus, it seems that reproductive attitudes are more predictive of nonmarital fertility than unintended fertility, perhaps because schemas represent not whether there should be a particular context (which would then correspond to whether births should be intended) but which specific contexts are appropriate (such as whether births should occur within committed and stable unions like marriage).

Second, do the effects of adolescent attitudes and knowledge on adult fertility work similarly across gender? We had expected that adolescent attitudes and knowledge might be more influential for women's than men's adult fertility, but the answer is a qualified no. Overall, there are few significant differences across men and women in the direction in which the key measures are associated with adult fertility, as indicated by the shading in Table 8. The few differences occur primarily when a measure is significant for one gender but non-significant and in the opposite direction for the other gender. The few gender differences are not consistent

across dependent variables. For instance, adolescents' perceived life course consequences of an early pregnancy more often predicts adult fertility for women than men, but the coefficients are only statistically different across gender for unintended first births relative to intended first births. Nonetheless, this is consistent with the notion that worries over the consequences of births weigh more heavily among women than men, as women are both socialized more about the risk of becoming pregnant and bear more of the costs of childbearing/rearing. Birth control attitudes are more often relevant for first birth transitions (both intendedness and marital status) among men than women, but the gender difference is only significant for the contrast between an unintended vs. intended first birth. Condom knowledge and reproductive biology knowledge also predict the marital status of births among fathers with two or more children in a statistically different manner than for their female counterparts. Together, this provides weak evidence that adolescent boys who better understood reproductive biology and had more accurate knowledge of, and favorable attitudes to, contraception made different fertility decisions as adults than either their female counterparts or their less knowledgeable and approving male counterparts. Still, even though there are few differences across gender in the direction of effects, adolescent reproductive attitudes seemed to be more strongly predictive of adult fertility among women than men, as evidenced by the greater number of "x" marks for women than men.

Limitations

The quality of male fertility data (Joyner et al., 2012) in surveys is always a concern. However, we are somewhat reassured to find that although men reported fewer births than women, conditional on reporting a birth, men and women had similar proportions experiencing unintended and nonmarital fertility. The levels of childlessness at Wave IV in Add Health are comparable to the levels in the NSFG, which is also reassuring. Another general concern is that,

like other studies on fertility, we are unable to analyze pregnancies that do not end in live birth due to under-reporting of abortion (Tierney, 2019), and our indicators of knowledge and attitudes do not include individuals' knowledge about or acceptability towards abortion. Similarly, there is sometimes concern about the reliability and accuracy of retrospective reports of birth intendedness (Guzzo & Hayford, 2014), along with more general concerns as to whether standard items and measurement truly capture individuals' often complex feelings about births (Kost & Zolna, 2019; Potter et al., 2014).

Our key measures at Wave I, especially the reproductive knowledge measures, were rather limited; for instance, there were no questions measuring knowledge about birth control methods besides condoms. Finally, our analysis only extends to the late 20s and early 30s. In this age group, many who will be parents eventually have not yet had any children, and this is likely to be especially true for the most advantaged group. Thus, analyses of fertility among this sample may be biased towards less advantaged individuals, and whether adolescent attitudes and knowledge are related to completed fertility remains unclear.

Conclusion

Consistent with recent developments in demographic theory, our research provides evidence that fertility schemas exist and are predictive of not just having children but the context in which children are born. Further, these schemas can be identified fairly early in the life course. A large body of work studies how adolescent attitudes toward school and work predict future life outcomes (e.g., Mortimer, Staff, & Lee, 2005; Schneider & Stevenson, 1999; Schoon, 2001). Our findings suggest that reproductive attitudes have a similarly long reach. Future research could examine the relationship between and among attitudes and outcomes in different domains (such as union formation or health behaviors) to further elucidate how adolescents' understand their

future goals and how these goals evolve into outcomes. At the same time, it is worth acknowledging that schemas may not be stable so much as self-reinforcing; that is, the conditions that lead to certain schema may be persistent over time, and individuals may act in ways that are consistent with their earlier schemas and therefore further solidify certain schemas and behavioral pathways (cf. Johnson-Hanks et al., 2011). More work is needed to analyze how schemas are developed and maintained as well as what circumstances may challenge previously held schema. Additionally, we encourage more investigation into the factors that influence men's fertility and family behaviors. The results here suggest that men's adolescent attitudes are less predictive of their adult behaviors, at least for childbearing, compared to women, and so more work is needed to understand how men make decisions about childbearing.

REFERENCES

Adamsons, K. (2010). Using identity theory to develop a midrange model of parental gatekeeping and parenting behavior. *Journal of Family Theory & Review*, *2*(2), 137-148.

Allen, S. M., & Hawkins, A. J. (1999). Maternal gatekeeping: Mothers' beliefs and behaviors that inhibit greater father involvement in family work. *Journal of Marriage and the Family*, *61*(1),199-212.

Allred, C., & Guzzo, K B. (2018) Men's birth expectations. Family Profile FP-18-12. National Center for Family and Marriage Research: Bowling Green State University.

Aughinbaugh, A., & Gardecki, R. M. (2008). Attrition in the National Longitudinal Survey of Youth 1997 (Working paper). National Center for Education Statistics. https://nces.ed.gov/FCSM/pdf/2007FCSM_Aughinbaugh-V-C.pdf Accessed 12/28/19.

Augustine, J. M. (2016). Exploring new life course patterns of mother's continuing secondary and college education. *Population Research and Policy Review*, 35, 727-755.

Bachrach, C. A., & Morgan, S. P. (2013). A cognitive–social model of fertility intentions. *Population and Development Review*, *39*(3), 459-485.

Barber, J. S. (2001). Ideational influences on the transition to parenthood: Attitudes toward childbearing and competing alternatives. *Social Psychology Quarterly*, 101-127.

Bearman, P. S. & Moody, J. (2004) Suicide and friendships among American adolescents. *American Journal of Public Health*, *94*(1), 89-95.

Bongaarts, J. (2006). The causes of stalling fertility transitions. *Studies in Family Planning*, *37*(1), 1-16.

Brückner, H., Martin, A., & Bearman, P. S. (2004). Ambivalence and pregnancy: adolescents' attitudes, contraceptive use and pregnancy. *Perspectives on Sexual and Reproductive Health*, *36*(6), 248-257.

Bute, J. J., & Jensen, R. E. (2010). Low-income women describe fertility-related expectations: Descriptive norms, injunctive norms, and behavior. *Health Communication*, *25*(8), 681-691

Clark, C. A., Baldwin, K. L., & Tanner, A. E. (2007). An exploratory study of selected sexual knowledge and attitudes of Indiana adults. *American Journal of Sexuality Education, 2*(3), 39-58.

Coale, A. (1973). The demographic transition. International Union for Scientific Study of Population, *International Population Conference, Liege* 1: 53-72.

Dehlendorf, C., Rodriguez, M. I., Levy, K., Borrero, S., & Steinauer, J. (2010). Disparities in Family Planning. *American Journal of Obstetrics and Gynecology, 202*(3), 214-220.

Deptula, D. P., Henry, D. B., Shoeny, M. E., & Slavick, J. T. (2006). Adolescent sexual behavior and attitudes: A costs and benefits approach. *Journal of Adolescent Health*, *38*(1), 35-43.

Driscoll, A. K., Sugland, B. W., Manlove, J., & Papillo, A. R. (2005). Community opportunity, perceptions of opportunity, and the odds of an adolescent birth. *Youth & Society*, *37*(1), 33-61.

Edin, K., & Kefalas, M. (2005). *Promises I can keep*. Berkeley: University of California Press.

Edin, K., & Nelson, T. J. (2013). *Doing the best I can: Fatherhood in the inner city*. University of California Press.

Fennell, J. L. (2011). Men bring condoms, women take pills: Men's and women's roles in contraceptive decision making. *Gender & Society*, *25*(4), 496-521.

Finer, L. B., & Zolna, M. R. (2016). Declines in unintended pregnancy in the United States, 2008–2011. *New England Journal of Medicine*, *374*(9), 843-852.

Fishbein, M., and Ajzen, I. (2010). *Predicting and changing behavior: The reasoned action approach*. New York: Psychology Press.

Frost, J. J., Lindberg, L. D., & Finer, L. B. (2012). Young adults' contraceptive knowledge, norms and attitudes: associations with risk of unintended pregnancy. *Perspectives on Sexual and Reproductive Health*, *44*(2), 107-116.

Garfield, C. F., Duncan, G., Peters, S., Rutsohn, J., McDade, T. W., Adam, E. K., ... & Chase-Lansdale, P. L. (2016). Adolescent reproductive knowledge, attitudes, and beliefs and future fatherhood. *Journal of Adolescent Health*, *58*(5), 497-503.

Greene, M. E., & Biddlecom, A. E. (2000). Absent and problematic men: Demographic accounts of male reproductive roles. *Population and Development Review*, *26*(1), 81-115.

Guzzo, K. B., & Hayford, S. R. (2014). Revisiting retrospective reporting of first-birth intendedness. *Maternal and Child Health*, *18*(9), 2141-2147.

Guzzo, K. B. & Hayford, S. R. (2018). Adolescent reproductive and contraceptive knowledge and attitudes and adult contraceptive behavior. *Maternal and Child Health, 22*(1), 32-40.

Guzzo, K. B., Hayford, S. R., & Lang, V. W. (2019). Adolescent fertility attitudes and childbearing in early adulthood. *Population Research and Policy Review*, *38*(1), 125-152.

Guzzo, K. B., Hayford, S. R., Lang, V. W., Wu, H. S., Barber, J., & Kusunoki, Y. (2019). Dimensions of reproductive attitudes and knowledge related to unintended childbearing among US adolescents and young adults. *Demography*, *56*(1), 201-228.

Hall, K. S., Sales, J. M., Komro, K. A., & Santelli, J. (2016). The state of sex education in the United States. *Journal of Adolescent Health*, *58*(6), 595-597.

Harding, D. J. (2007). Cultural context, sexual behavior, and romantic relationships in disadvantaged neighborhoods. *American Sociological Review*, *72*(3), 341-364.

Hayford, S. R., Guzzo, K. B., Kusunoki, Y., & Barber, J. S. (2016). Perceived costs and benefits of early childbearing: New dimensions and predictive power. *Perspectives on Sexual and Reproductive Health, 48*(2), 83-91.

Hayford, S. R., & Morgan, S. P. (2008). Religiosity and fertility in the United States: The role of fertility intentions. *Social Forces*, *86*(3), 1163-1188.

Hust, S. J., Brown, J. D., & Ladin, L. E. 2008. Boys will be boys and girls better be prepared: An analysis of the rare sexual health messages in young adolescents' media. *Mass Communication & Society, 11*(1), 3-23.

Jaccard, J., Dodge, T., & Dittus, P. (2003). Do adolescents want to avoid pregnancy? Attitudes toward pregnancy as predictors of pregnancy. *Journal of Adolescent Health*, *33*(2), 79-83.

James-Hawkins, L., & Sennott, C. (2015). Low-income women's navigation of childbearing norms throughout the reproductive life course. *Qualitative Health Research, 25*(1), 62-75

Jensen, R. E., & Bute, J. J. (2010). Fertility-related perceptions and behaviors among low-income women: Injunctive norms, sanctions, and the assumption of choice. *Qualitative Health Research*, *20*(11), 1573-1584

Johnson-Hanks, J. A., Bachrach, C. A., Morgan, S.P., & Koher, H.-P. (2011) *Understanding family change and variation: Toward a theory of conjunctural action*. New York: Springer.

Joyner, K., Peters, H. E., Hynes, K., Sikora, A., Taber, J. R., & Rendall, M. S. (2012). The quality of male fertility data in major US surveys. *Demography*, *49*(1), 101-124.

Kendall, C., Afable-Munsuz, A., Speizer, I., Avery, A., Schmidt, N., & Santelli, J. (2005). Understanding pregnancy in a population of inner-city women in New Orleans—results of qualitative research. *Social Science & Medicine*, *60*(2), 297-311.

Kim, Y., & Raley, R. K. (2015). Race-ethnic differences in the non-marital fertility rates in 2006–2010. *Population research and policy review*, *34*(1), 141-159.

Kirby, D., & Lepore, G. (2007). *Sexual risk and protective factors: Factors affecting teen sexual behavior, pregnancy, childbearing and sexually transmitted disease*. Washington, DC: ETR Associates and The National Campaign to Prevent Teen and Unplanned Pregnancy.

Kost, K., & Zolna, M. (2019). Challenging unintended pregnancy as an indicator of reproductive autonomy: a response. *Contraception*, *100*(1), 5-9.

Kottke, M. (2014). Sexuality education. Ch. 12 (pp. 179-191) in Whitaker, A., and Gilliam, M. (Eds.) *Contraception for Adolescent and Adult Women.* New York: Springer.

Lindberg, L. D., Maddow-Zimet, I., & Boonstra, H. (2016). Changes in adolescents' receipt of sex education, 2006–2013. *Journal of Adolescent Health*, *58*(6), 621-627.

Miller, W. B. (1994). Childbearing motivations, desires, and intentions: A theoretical framework. *Genetic, Social, and General Psychology Monographs*, 120, 223–258.

Miller, W. B. (1995). Childbearing motivation and its measurement. *Journal of Biosocial Science, 27*(4), 473–487.

Miller, W. B., Severy, L., & Pasta, D. (2004). A framework for modelling fertility motivation in couples. *Population Studies*, *58*(2), 193-205.

Mollborn, S. (2010). Predictors and consequences of adolescents' norms against teenage pregnancy. *The Sociological Quarterly*, *51*(2), 303-328.

Mollborn, S. (2017). *Mixed messages: Norms and social control around teen sex and pregnancy*. New York: Oxford University Press.

Mortimer, J. T., Staff, J., & Lee, J. C. (2005). Agency and structure in educational attainment and the transition to adulthood. *Advances in Life Course Research*, *10*(0), 131-153.

Organisation for Economic Co-Operation and Development. (2016). OECD Family Database, SF.2.2. Ideal and actual number of children. https://www.oecd.org/els/family/SF_2_2-Ideal-actual-number-children.pdf Accessed 3/21/19.

Pearce, L. D., & Davis, S. N. (2016). How early life religious exposure relates to the timing of first birth. *Journal of Marriage and Family, 78*(5), 1422-1438.

Philipov, D., Thévenon, O., Klobas, J., Bernardi, L., & Liefbroer, A. C. (2009). Reproductive decision-making in a macro-micro perspective (REPRO): State-of-the-art review. European Demographic Research Paper 1, Vienna Institute of Demography. https://www.oeaw.ac.at/fileadmin/subsites/Institute/VID/PDF/Publications/EDRP/edrp_2009_01.pdf Accessed 2/14/18.

Potter, J. E., Stevenson, A. J., Coleman-Minahan, K., Hopkins, K., White, K., Baum, S. E., & Grossman, D. (2019). Challenging unintended pregnancy as an indicator of reproductive autonomy. *Contraception*.

Rajan, S., Morgan, S. P., Harris, K. M., Guilkey, D., Hayford, S. R., & Guzzo, K. B. (2017). Trajectories of unintended fertility. *Population research and policy review*, *36*(6), 903-928.

Rindfuss, R. R., & St. John, C. (1983). Social determinants of age at first birth. *Journal of Marriage and the Family*, 553-565.

Rocca, C. H., & Harper, C. C. (2012). Do racial and ethnic differences in contraceptive attitudes and knowledge explain disparities in method use? *Perspective on Sexual and Reproductive Health, 44*(3), 150-158.

Rock, E. M., Ireland, M., Resnick, M. D., & McNeely, C. A. (2005). A rose by any other name? Objective knowledge, perceived knowledge, and adolescent male condom use. *Pediatrics*, *115*(3), 667-672.

Rocque, M., Posick, C., & White, H. R. (2015). Growing up is hard to do: An empirical evaluation of maturation and desistance. *Journal of Developmental and Life-Course Criminology*, *1*(4), 350-384.

Manlove, J., Ryan, S., & Franzetta, K. (2007). Contraceptive use patterns across teens' sexual relationships: The role of relationships, partners, and sexual histories. *Demography*, *44*(3), 603-621.

Ryan, S., Franzetta, K., Manlove, J., & Holcombe, E. (2007). Adolescents' discussions about contraception or STDs with partners before first sex. *Perspectives on Sexual and Reproductive Health*, *39*(3), 149-157.

Saad, L. (2018). Americans, in theory, think larger families are ideal. Washington, DC: Gallup. https://news.gallup.com/poll/236696/americans-theory-think-larger-families-ideal.aspx Accessed 12/17/18.

Schneider, B. L., & Stevenson, D. (1999). *The ambitious generation: America's teenagers, motivated but directionless*. Yale University Press.

Schoon, I. (2001). Teenage job aspirations and career attainment in adulthood: A 17-year follow-up study of teenagers who aspired to become scientists, health professionals, or engineers. *International Journal of Behavioral Development*, *25*(2), 124-132.

Shattuck, R. M. (2019). Preferences against nonmarital fertility predict steps to prevent nonmarital pregnancy. *Population Research and Policy Review, 38*(4): 565-591.

Shattuck, R. M. (2017). Does it matter what she wants? The role of individual preferences against unmarried motherhood in young women's likelihood of a nonmarital first birth. *Demography*, *54*(4), 1451-1475.

Schoppe-Sullivan, S. J., Brown, G. L., Cannon, E. A., Mangelsdorf, S. C., & Sokolowski, M. S. (2008). Maternal gatekeeping, coparenting quality, and fathering behavior in families with infants. *Journal of Family Psychology, 22(3)*, 389.

Shneyderman, Y., & Schwartz, S. J. (2013). Contextual and intrapersonal predictors of adolescent risky sexual behavior and outcomes. *Health Education & Behavior*, *40*(4), 400-414.

Shreffler, K. M., Greil, A. L., Mitchell, K. S., & McQuillan, J. (2015). Variation in pregnancy intendedness across US women's pregnancies. *Maternal and Child Health Journal*, *19*(5), 932-938.

Stryker, S. (1987) Identity theory: Developments and extensions. In K. Yardley & T. Honess (Eds*.), Self and identity: Psychosocial perspectives* (pp. 89 – 103). New York: John Wiley & Sons.

Tierney, K. I. (2019). Abortion underreporting in Add Health: Findings and implications. *Population Research and Policy Review*, *38*(3), 417-428.

Townsend, N. (2002). *The* p*ackage deal: Marriage, work and fatherhood in men's lives*. Temple University Press.

Walzer, S. (1998). *Thinking about the baby: Gender and transitions into parenthood*. Temple University Press.

Warren, J. R., Hoffman, E., & Andrew, M (2014). Patterns and trends in grade retention rates in the United States, 1995-2010. *Educational Researcher, 43*(9), 433-443.

Wynn, L. L., Foster, A. M., & Trussell, J. (2009). 'Can I get pregnant from oral sex?' Sexual health misperceptions in e-mails to a reproductive health website. *Contraception 79*, 91-97.

Yabiku, S. T., Axinn, W. G., & Thornton, A. (1999). Family integration and children's self-esteem. *American Journal of Sociology, 104*(5), 1494-1524.

Table 1. Adolescent Reproductive Attitudes and Knowledge Measures in Add Health

Reproductive Attitudes [A]

Feelings toward Pregnancy

Getting pregnant at this time in your life is one of the worst things that could happen to you.

It wouldn't be all that bad if you got pregnant now.

Birth Control Attitudes

It {IS/WOULD BE} too hard to get a {GIRL/BOY} to use birth control with you.

Using birth control is morally wrong.

In general, birth control is too much of a hassle to use.

It takes too much planning ahead of time to have birth control on hand when you're going to have sex.

For you, using birth control interferes/would interfere with sexual enjoyment

In general, birth control is too expensive to buy.

Life Course Consequences

If you got (If R is male, add: someone) pregnant, it would be embarrassing for your family.

If you got pregnant (If R is male, add: someone), it would be embarrassing for you.

If you got pregnant, you would be forced to grow up too fast.

If you got pregnant, you would have to quit school.

Reproductive Knowledge

Female Reproductive Biology Knowledge (true/false) [B]

The most likely time for a woman to get pregnant is right before her period starts. (false)

In general, a woman is most likely to get pregnant if she has sex during her period, as compared with other times of the month. (false)

Condom Knowledge (true/false) [B]

Even if the man pulls out before he ejaculates, even if ejaculation occurs outside of the woman's body, it is still possible for the woman to become pregnant. (true)

When putting on a condom, it is important to have it fit tightly, leaving no space at the tip. (false)

Vaseline can be used with condoms, and they work just as well. (false)

As long as the condom fits over the tip of the penis, it doesn't matter how far down it is unrolled. (false)

Birth Control Confidence [C]

You are quite knowledgeable about the rhythm method of birth control and when it is a "safe" time during the month for a woman to have sex and not get pregnant.

You are quite knowledgeable about how to use a condom correctly.

You are quite knowledgeable about the withdrawal method of birth control.

[A] All items measured on a scale of 1=strongly agree to 5=strongly disagree, with 3=neither agree not disagree. Analytically, items were reverse coded as necessary such that higher responses mean less favorable attitudes toward childbearing and more favorable attitudes toward contraception.

[B] Analytically, items were recoded so that 1 equals the correct answer, and 0 equals the incorrect answer.

[C] Originally measured on a scale of 1=strongly agree to 5=strongly disagree. Recoded as a dichotomous variable: 1=strongly agree/agree and 0=all other responses.

Table 2. Weighted Unintended and Nonmarital Fertility in Add Health, by Gender

	Full sample			Parents		Parents w/ 2 or more children	
	Women	Men		Women	Men	Women	Men
1st birth intendedness							
No birth	42.1%	57.0%	***	--	--	--	--
Intended birth	33.4%	25.9%		57.6%	60.3%	52.7%	58.1%
Unintended birth	24.6%	17.1%		42.4%	39.7%	47.3%	41.9%
1st birth marital status							
No birth	42.1%	57.0%	***	--	--	--	--
Marital birth	28.5%	21.8%		49.1%	50.6%	45.2%	46.1%
Nonmarital birth	29.5%	21.3%		50.9%	49.4%	54.8%	53.9%
Fertility by intendedness by Wave IV							
No birth	42.1%	57.0%	***	--	--	--	--
Only intended birth(s)	28.5%	22.5%		49.2%	52.1%	37.9%	42.2%
Both intended & unintended births	15.3%	9.3%		26.4%	21.7%	44.7%	42.3%
Only unintended births	14.1%	11.3%		24.4%	26.2%	17.4%	15.6%
Fertility by marital status by Wave IV							
No birth	42.1%	57.0%	***	--	--	--	--
Only marital birth(s)	27.2%	20.8%		46.9%	48.4%	41.4%	41.8%
Both marital & nonmarital births	9.5%	6.7%		16.5%	15.5%	27.9%	30.1%
Only nonmarital birth(s)	21.3%	21.3%		36.7%	36.2%	30.7%	28.1%
N	5,012	4,440		2,860	1,887	1,682	940

*p < 0.05, **p < 0.01, ***p < 0.001 Significant differences between men and women in the distribution from Pearson chi-square tests.

Table 3. Weighted Distributions or Means (Standard Deviations) by Gender

	Women		Men		
Adolescent attitudes & knowledge					
Reproductive attitudes (range 1-5)					
Feelings toward pregnancy	4.36	(0.84)	4.36	(0.77)	
Life course consequences	3.51	(0.91)	3.40	(0.86)	***
Birth control attitudes	4.09	(0.79)	3.86	(0.77)	***
Reproductive knowledge					
Female reproductive biology knowledge (range 0-2)[A]	1.00	(0.78)	0.96	(0.73)	
Condom knowledge (range 0-4)[A]	2.88	(1.12)	2.79	(1.04)	*
Birth control confidence (range 0-3)[B]	1.98	(1.12)	2.15	(0.91)	***
Wave I characteristics					
Race-ethnicity					
Non-Hispanic White	68.5%		68.9%		
Non-Hispanic Black	15.7%		14.2%		
Hispanic	11.3%		11.3%		
Asian/other	4.4%		5.6%		
Foreign-born	6.3%		6.4%		
Family structure					
Both bio parents	56.3%		56.1%		
Stepfamily	15.5%		16.3%		
Single parent	22.6%		21.8%		
Other	5.5%		5.8%		
Family SES (range 1-10)	5.51	(2.78)	5.60	(2.53)	
Ever had sex	45.8%		43.5%		
Discussed pregnancy or AIDS at school	91.4%		88.2%		***
Religiosity (1-4 scale)	3.56	(1.61)	3.53	(1.62)	
Highly wanted & expected to attend college	56.3%		44.0%		***
Aptitude test	100.51	(15.07)	101.94	(13.16)	**
Locus of control (1-5 scale)	3.66	(0.49)	3.70	(0.47)	
Wave IV characteristics					
Age	29.7	(1.22)	29.9	(.1.20)	***
Education					***
Less than high school	5.2%		7.4%		
High school/GED	47.8%		56.3%		
Associate's degree	9.8%		6.9%		
Bachelor's degree or higher	37.3%		29.4%		
N	5,012		4,440		

*p < 0.05, **p < 0.01, ***p < 0.001 Significant differences across gender in distribution or mean

[A] Number of correct responses

[B] Number strongly agree/agree is knowledgeable

Table 4. Relative Risk Ratios from Multinomial Logistic Discrete Time Event History Models Predicting First Birth Intendedness, by Gender

	Women			Men		
	No birth v. unintended	No birth v. intended	Unintended v. intended	No birth vs. unintended	No birth v. intended	Unintended v. intended
Reproductive attitudes						
Feelings toward pregnancy	1.11	1.22 ***	1.10	0.94	1.09	1.16
Life course consequences	1.26 ***	1.05	0.83 **	1.11	1.13 *	1.02
Birth control attitudes	1.00	0.99	1.00	1.11	0.88 *	0.79 **
Reproductive knowledge						
Female reproductive biology knowledge	1.04	0.96	0.93	1.02	0.98	0.96
Condom knowledge	1.04	1.02	0.98	1.02	1.02	1.01
Birth control confidence	0.91 *	0.95	1.04	0.93	0.97	1.04
Person-months		552,632			570,917	

Note: Models control for race-ethnicity, nativity, WI family structure, WI family socioeconomic status, WI ever sex, WI sex ed, WI religiosity, WI college aspirations & expectations, WI aptitude, WI locus of control, time-varying age, time varying education, and months of duration

*p < 0.05, **p < 0.01, ***p < 0.001

Shading indicates significant differences in coefficients at *p <0.05 across gender from Wald chi-square tests.

Table 5. Relative Risk Ratios from Multinomial Logistic Regression Predicting Unintended Fertility at Wave IV among Parents with Two or More Children, by Gender

	Women			Men		
	Both intended & unintended v. only intended	Only unintended v. only intended	Only unintended v. both intended & unintended	Both intended & unintended v. only intended	Only unintended v. only intended	Only unintended v. both intended & unintended
Reproductive attitudes						
Feelings toward pregnancy	0.98	1.21	1.23	0.95	0.95	1.00
Life course consequences	0.84 *	0.81	0.97	1.00	1.24	1.25
Birth control attitudes	0.91	0.88	0.97	0.96	0.82	0.86
Reproductive knowledge						
Female reproductive biology knowledge	0.96	0.80	0.83	0.97	1.24	1.28
Condom knowledge	1.13	1.07	0.95	0.93	0.90	0.97
Birth control confidence	1.05	0.89	0.85	1.06	1.19	1.12
N	1,682			940		

Note: Models control for race-ethnicity, nativity, WI family structure, WI family socioeconomic status, WI ever sex, WI sex ed, WI religiosity, WI college aspirations & expectations, WI aptitude, WI locus of control, WIV age, and WIV education

*p < 0.05, **p < 0.01, ***p < 0.001

Shading indicates significant differences in coefficients at *p < 0.05 across gender from Wald tests.

Table 6. Relative Risk Ratios from Multinomial Logistic Discrete Time Event History Models Predicting First Birth Marital Status, by Gender

	Women			Men		
	No birth v. nonmarital	No birth v. marital	Nonmarital v. marital	No birth v. nonmarital	No birth v. marital	Nonmarital v. marital
Reproductive attitudes						
Feelings toward pregnancy	1.15 **	1.20 ***	1.05	1.01	1.05	1.04
Life course consequences	1.28 ***	0.99	0.78 ***	1.19 **	1.06	0.89
Birth control attitudes	1.03	0.95	0.92	1.09	0.86 *	0.79 **
Reproductive knowledge						
Female reproductive biology knowledge	0.97	1.02	1.04	1.01	0.99	0.98
Condom knowledge	0.99	1.07	1.08	1.07	0.96	0.90
Birth control confidence	0.90 *	0.96	1.07	0.93	0.97	1.04
Person-months		552,632			570,917	

Note: Models control for race-ethnicity, nativity, WI family structure, WI family socioeconomic status, WI ever sex, WI sex ed, WI religiosity, WI college aspirations & expectations, WI aptitude, WI locus of control, time-varying age, time varying education, and months of duration

*p < 0.05, **p < 0.01, ***p < 0.001

Shading indicates significant differences in coefficients at *p < 0.05 across gender from Wald chi-square tests.

Table 7. Relative Risk Ratios from Multinomial Logistic Regression Predicting Nonmarital Fertility at Wave IV among Parents with Two or More Children, by Gender

	Women			Men		
	Both marital & nonmarital v. only marital	Only nonmarital v. only marital	Only nonmarital v. both marital & nonmarital	Both marital & nonmarital v. only marital	Only nonmarital v. only marital	Only nonmarital v. both marital & nonmarital
Reproductive attitudes						
Feelings toward pregnancy	0.97	0.89	0.92	0.80	0.80	1.01
Life course consequences	0.77 *	0.63 ***	0.82	0.85	0.82	0.96
Birth control attitudes	0.98	0.73 **	0.74 **	1.20	0.74	0.62 **
Reproductive knowledge						
Female reproductive biology knowledge	1.05	0.97	0.92	0.88	1.30	1.48 *
Condom knowledge	1.18	1.00	0.85	0.86	0.68 **	0.80
Birth control confidence	1.08	1.09	1.01	1.00	1.05	1.05
N	1,682			940		

Note: Models control for race-ethnicity, nativity, WI family structure, WI family socioeconomic status, WI ever sex, WI sex ed, WI religiosity, WI college aspirations & expectations, WI aptitude, WI locus of control, WIV age, and WIV education

*p < 0.05, **p < 0.01, ***p < 0.001

Shading indicates significant differences in coefficients at *p <0.05 across gender from Wald tests.

Table 8. Summary Table of Results of Models using Wave I Reproductive Attitudes and Knowledge to Predict Wave IV Fertility, by Gender

	Number of births		Intendedness				Marital Status			
	Women	Men	Women: 1st births	Men: 1st births	Women:≥ 2 births	Men: ≥ 2 births	Women: 1st births	Men: 1st births	Women:≥ 2 births	Men: ≥ 2 births
Reproductive attitudes										
Feelings toward pregnancy	x		x				xx			
Life course consequences	x		xx	x	x		xx	x	xx	
Birth control attitudes				xx				xx	xx	x
Reproductive knowledge										
Female reproductive biology knowledge										x
Condom knowledge										x
Birth control confidence			x				x			

Key: An "x" indicates that the particular measure significantly predicts at least one of the contrasts for each outcome (all have three contrasts because the dependent variable has three categories), and shading indicates significant differences between men and women for at least one contrast. The number of "x" marks indicates the number of contrasts for which that measure is significant.

Appendix A. Relative Risk Ratios from Zero-Inflated Poisson Models Predicting WIV Parity, by Gender

	Women			Men		
Reproductive attitudes	Coefficient	Std. Err.		Coefficient	Std. Err.	
Feelings toward pregnancy	-0.07	0.02	**	-0.06	0.03	
Life course consequences	-0.08	0.02	**	-0.02	0.03	
Birth control attitudes	-0.02	0.02		-0.00	0.03	
Reproductive knowledge						
Female reproductive biology knowledge	0.00	0.03		-0.05	0.03	
Condom knowledge	-0.02	0.02		0.00	0.03	
Birth control confidence	0.02	0.02		0.04	0.03	
Race-ethnicity						
Non-Hispanic White	--	--		--	--	
Non-Hispanic Black	-0.00	0.05		0.15	0.07	
Hispanic	-0.07	0.07		0.04	0.08	
Asian/other	-0.05	0.09		-0.39	0.20	
Foreign-born	0.04	0.08		0.12	0.15	
WI family structure						
Both biological parents	--	--		--	--	
Stepfamily	0.09	0.04	*	0.00	0.06	
Single mom/dad	0.04	0.05		-0.15	0.06	*
Other	0.09	0.08		-0.03	0.09	
WI family socioeconomic status	-0.03	0.01	**	0.00	0.01	**
W1 sex	0.18	0.05	**	-0.15	0.05	***
WI discussed pregnancy or AIDS at school	0.14	0.07	*	-0.03	0.07	
WI religiosity	-0.00	0.01		-0.04	0.01	
WI highly wanted & expected to attend college	0.03	0.04		0.21	0.06	
WI PPVT	-0.00	0.00		-0.02	0.00	
WI locus of control	-0.01	0.04		-0.01	0.05	
Education						
Less than high school	0.20	0.08	*	0.14	0.08	
High school	--	--		--	--	
Associate's degree	-0.21	0.05	***	-0.29	0.09	**
Bachelor's degree or higher	-0.65	0.07	***	-0.63	0.10	***
Constant	1.11	0.24	***	0.55	0.32	
Inflation						
W4 age	-0.31	0.32		-0.14	0.08	
Constant	6.66	9.20		3.35	2.37	
Persons	5,012			4,440		

*p < 0.05, **p < 0.01, ***p < 0.001

Appendix B. Relative Risk Ratios for Covariates from Multinomial Logistic Discrete Time Event History Models Predicting First Birth Intendedness, by Gender

	Women			Men		
	No birth v. unintended	No birth v. intended	Unintended v. intended	No birth vs. unintended	No birth v. intended	Unintended v. intended
Race-ethnicity						
Non-Hispanic White	--	--	--	--	--	--
Non-Hispanic Black	0.82	1.80 ***	2.18 ***	0.67 **	1.23	1.84 **
Hispanic	0.95	1.30	1.36	1.04	1.08	1.04
Asian/other	1.02	1.29	1.27	1.37	1.96 **	1.43
Foreign-born	0.89	1.12	1.26	1.30	1.03	0.79
Age (time-varying)						
15-19	1.12	1.83 ***	1.63 *	1.30	2.07 **	1.59
20-24	--	--	--	--	--	--
25-29	2.10 ***	0.92	0.44 **	1.65 *	1.07	0.64
30 or older	6.10 ***	0.91	0.15 ***	3.61 **	1.74	0.48
WI family structure						
Both biological parents	--	--	--	--	--	--
Stepfamily	0.64 ***	0.91	1.42 *	1.00 **	0.91	0.91
Single mom/dad	0.73 **	1.01	1.39 *	1.11 ***	1.19	1.07
Other	0.69 *	0.83	1.21	0.89	0.89	0.99
WI family socioeconomic status	1.09 ***	1.06 ***	0.97	1.07	1.03	0.97
W1 sex	0.66 ***	0.73 **	1.10	0.53	0.66 ***	1.24
WI discussed pregnancy or AIDS at school	0.76	0.89	1.17	1.03	0.98	0.95
WI religiosity	1.04	0.98	0.95 *	1.02	1.01	0.99
WI highly wanted & expected to attend college	1.18	1.00	0.85	1.24	1.23 *	0.99 *
WI PPVT	1.00	1.01 ***	1.01 ***	0.99	1.01 **	1.02
WI locus of control	0.97	0.97	0.99	0.92	0.84 *	0.91
Education (time-varying)						
Less than high school	0.94	1.09	1.16	1.15	0.95	0.83
High school	--	--	--	--	--	--
Associate's degree	1.03	1.03	1.01	1.22	0.77	0.63
Bachelor's degree or higher	1.97 ***	1.10	0.56 ***	1.57 *	0.93	0.59 *
Duration in months (time-varying)	0.99 **	0.99 ***	1.00	0.99 *	0.99 **	0.99
Constant	167.96 ***	63.55 ***	0.38	1269.92 ***	626.96 **	0.48
Persons		5,012			4,440	
Person-months		552,632			570,917	

*p < 0.05, **p < 0.01, ***p < 0.001

Appendix C. Relative Risk Ratios for Covariates from Multinomial Logistic Regression Predicting Unintended Fertility at Wave IV among Parents with Two or More Children, by Gender

	Women			Men		
	Both intended & unintended v. only intended	Only unintended v. only intended	Only unintended v. both intended & unintended	Both intended & unintended v. only intended	Only unintended v. only intended	Only unintended v. both intended & unintended
Race-ethnicity						
Non-Hispanic White	--	--	--	--	--	--
Non-Hispanic Black	2.97 ***	3.22 ***	1.08	1.43	2.58 **	1.80
Hispanic	1.83 *	0.80	0.44 *	1.72	1.81	1.05
Asian/other	1.26	0.86	0.68	3.03	3.26	1.08
Foreign-born	1.06	1.46	1.37	1.01	0.34	0.33
W4 age	0.91	0.90	0.99	1.01	0.99	0.99
WI family structure						
Both biological parents	--	--	--	--	--	--
Stepfamily	1.33	1.79 *	1.34 *	1.09	1.64	1.51
Single mom/dad	1.32	1.63 *	1.23	1.58 *	1.37	0.87
Other	1.28	1.50	1.17	2.03	2.22	1.10
WI family socioeconomic status	1.05	0.97	0.92	0.93	1.02	1.10
W1 sex	1.12	1.16	1.04	0.80	1.37	1.72
WI discussed pregnancy or AIDS at school	1.65	1.47	0.89	1.05	0.72	0.69
WI religiosity	1.03	0.93	0.90	0.94	1.00	1.06
WI highly wanted & expected to attend college	0.70	0.72	1.02	1.51	1.16	0.77
WI PPVT	1.01	1.02 *	1.01	1.04 ***	1.02 *	0.98
WI locus of control	0.96	0.86	0.90	0.83	0.61	0.73
Education						
Less than high school	1.95 *	1.56	0.80	1.13	2.07	1.84
High school	--	--	--	--	--	--
Associate's degree	1.64	1.19	0.72	0.80	0.61	0.76
Bachelor's degree or higher	0.91	0.29 **	0.32 **	0.41 *	0.22 **	0.53
Constant	4.04	4.16	1.03	0.06	0.15	2.36
Persons		1,682			940	

*p < 0.05, **p < 0.01, ***p < 0.001

Appendix D. Relative Risk Ratios for Covariates from Multinomial Logistic Discrete Time Event History Models Predicting First Birth Marital Status, by Gender

	Women			Men		
	No birth v. nonmarital	No birth v. marital	Nonmarital v. marital	No birth v. nonmarital	No birth v. marital	Nonmarital v. marital
Race-ethnicity						
Non-Hispanic White	--	--	--	--	--	--
Non-Hispanic Black	0.72 **	3.85 ***	5.33 ***	0.58 ***	2.19 ***	3.77 ***
Hispanic	0.88	1.45	1.64	0.81	1.38 *	1.70 **
Asian/other	1.12	1.29	1.15	1.53	1.90 *	1.24
Foreign-born	1.21	0.85	0.70	1.14	1.07	0.93
Age (time-varying)						
15-19	1.16	2.08 ***	1.79 ***	1.27	2.73 ***	2.15 **
20-24	--	--	--	--	--	--
25-29	2.05 ***	0.86	0.42 ***	2.13 ***	0.79	0.37 ***
30 or older	4.32 ***	0.81	0.19 ***	4.79 ***	1.21	0.25 ***
WI family structure						
Both biological parents	--	--	--	--	--	--
Stepfamily	0.58 ***	1.05	1.79 ***	0.92	0.96	1.04
Single mom/dad	0.70 **	1.11	1.58 **	1.03	1.32 *	1.28
Other	0.62 **	1.01	1.64 *	0.75	1.11	1.48
WI family socioeconomic status	1.07 ***	1.07 ***	1.00	1.05 *	1.05 *	0.99
W1 sex	0.62 ***	0.78 *	1.27 *	0.49 ***	0.74 **	1.52 **
WI discussed pregnancy or AIDS at school	0.85	0.82	0.97	1.01	0.99	0.98
WI religiosity	1.00	1.01	1.01	1.01	1.01	1.00
WI highly wanted & expected to attend college	1.19	0.97	0.81	1.27 *	1.20 *	0.95
WI PPVT	1.01	1.01	1.00	1.00	1.01	1.01
WI locus of control	0.97	0.98	1.01	0.95	0.80 *	0.84
Education (time-varying)						
Less than high school	0.87	1.42 *	1.64 **	0.86	1.43 *	1.65 *
High school	--	--	--	--	--	--
Associate's degree	1.52	0.89	0.58 *	1.14	0.81	0.71
Bachelor's degree or higher	2.92 ***	1.04	0.36 **	2.01 ***	0.93	0.46 ***
Duration in months (time-varying)	0.99 ***	0.99 ***	1.00	0.99 ***	0.99 ***	1.00
Constant	79.90 ***	141.83 ***	1.78	572.57 ***	1377.52 ***	2.41
Persons		5,012			4,440	
Person-months		552,632			570,917	

*p < 0.05, **p < 0.01, ***p < 0.001

Appendix E. Relative Risk Ratios for Covariates from Multinomial Logistic Regression Predicting Unintended Fertility at Wave IV among Parents with Two or More Children, by Gender

	Women			Men		
	Both marital & nonmarital v. only marital	Only nonmarital v. only marital	Only nonmarital v. both marital & nonmarital	Both marital & nonmarital v. only marital	Only nonmarital v. only marital	Only nonmarital v. both marital & nonmarital
Race-ethnicity						
Non-Hispanic White	--	--	--	--	--	--
Non-Hispanic Black	3.79 ***	3.10 ***	2.64 ***	4.94 ***	9.91 ***	2.01 *
Hispanic	1.45	0.51	1.09	2.04 *	1.38	0.68
Asian/other	0.89	1.04	1.16	1.88	2.16	1.15
Foreign-born	1.01	0.65	0.65	1.20	0.50	0.42
W4 age	0.72 ***	0.69 ***	0.95	0.74 **	0.66 ***	0.89
WI family structure						
Both biological parents	--	--	--	--	--	--
Stepfamily	1.62	1.72 *	1.06	0.92	1.31	1.41
Single mom/dad	1.83 **	2.77 ***	1.52 *	1.72	2.73 **	1.59
Other	1.85	2.12	1.15	2.52 *	4.45 **	1.77
WI family socioeconomic status	1.01	0.95	0.93	1.00	0.95	0.95
W1 sex	1.91 **	1.72 *	0.90	1.72 *	2.69 **	1.56
WI discussed pregnancy or AIDS at school	2.39 *	2.06 *	0.86	1.06	2.15	2.03
WI religiosity	1.10	1.05	0.96	0.94	1.01	1.07
WI highly wanted & expected to attend college	1.08	0.77	0.71	0.93	0.96	1.04
WI PPVT	0.99	1.00	1.00	1.02 *	1.02	1.00
WI locus of control	1.24	1.10	0.89	0.83	0.92	1.12
Education						
Less than high school	1.98	1.81	0.91	2.43 *	4.32 **	1.78
High school	--	--	--	--	--	--
Associates degree	0.89	0.67	0.76	1.01	0.40	0.40
Bachelor's degree or higher	0.34 ***	0.19 ***	0.55 *	0.32 ***	0.13 ***	0.40
Constant	2757.05 **	308295.46	111.82	1012.45 *	243917.10 ***	60.79
Persons		1682				

*p < 0.05, **p < 0.01, ***p < 0.001