



Research Report

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Attitudes Predicting Pregnancies
Reported in an Online Weekly
Survey: Preliminary Results

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Preliminary Results**

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ABSTRACT

We have three goals in this paper. First, we assess the relationship between a very wide array of attitudinal measures and early pregnancy. We find a wide range of attitudinal measures that predict pregnancy rates among young women. Particularly strong and consistent predictors include perceptions of friends' and parents' approval of pregnancy and related behaviors; positive perceptions of others who become pregnant and engage in related behaviors; desires, willingness, and expectations to become pregnant and engage in related behaviors; general attitudes toward pregnancy and related behaviors, particularly attitudes that the respondent is not ready for sex, birth control is a hassle, and pregnancy has negative consequences; positive attitudes toward caring for children; and the respondent's perception that she may be unable to become pregnant. Second, we explore the proximate determinants that explain the relationship between attitudes and pregnancy. Overall, attitudinal measures that are related to sexual behavior are explained by actual sexual behavior, measures that are related to contraceptive use are explained by contraceptive behavior, and attitudes that are not limited to sex or contraception tend to be explained by both behaviors. Finally, we find general support for two broad types of attitude-behavior models described in the literature: rational models that posit a direct link between wanting to become pregnant (and have a baby) and actually becoming pregnant, and models that posit an irrational component to behavior. Next steps for the paper include further testing and refinement of our measures of mediating variables, and more formally testing the theoretical models.

Although the United States experienced declines in unintended childbearing in the 1970s and early 1980s, levels have recently risen, and the most recent national estimates indicate that approximately 35% of live births from 1997-2002 were unintended at the time of conception (Chandra et al. 2005). Unintended childbearing is associated with a wide range of negative health statuses for children and mothers (Brown and Eisenberg 1995). The negative consequences include delayed prenatal care, depression, poor birth outcomes, divorce, developmental delay, and even child abuse. In fact, the combination of these negative health statuses and rising levels of unintended childbearing led the U.S. Department of Health and Human Services (in its National Health Promotion and Disease Prevention Objectives) to target a substantial reduction in unintended childbearing in its objectives for both 2000 (formulated in 1990) and 2010 (formulated in 2000). According to data available from the most recent national estimates of unintended childbearing, the goal for 2000 was not met, and the goal for 2010 is not likely to be met either. Research that has addressed the social consequences of unintended childbearing suggests that they may be severe, may permeate multiple aspects of social life, and may persist for the very long term (Axinn et al. 1998; Barber et al. 1999; Baydar 1995; Brown and Eisenberg 1995).

Attitudes and related behaviors are crucial aspects of the context of unintended pregnancy. Many models of behavior share the assumption that behavior results from a rational process, where individuals consider their options, evaluate the consequences, and make decisions about how to act. For example, the most widely used social science framework to understand the relationships among attitudes, intentions, and behavior combines the reasoned action and planned behavior frameworks (Fishbein and Ajzen 1975). In this framework, general attitudes, beliefs, and preferences related to a behavior predict intentions, and intentions predict behavior. Other social psychological theories share this assumption as well, including subjective expected utility theory (Ronis 1992) and protection motivation theory (Rogers 1983). And, demographic theories of fertility decline draw on similar concepts – for example, Lesthaeghe's "Ready, Willing, and Able" (Lesthaeghe and Vanderhoeft 2001; Lesthaeghe and Wilson 1986) and Ansley Coale's "Three Conditions for Fertility Decline" (Coale 1972).

The notion that individuals are more likely to perform the behaviors that they feel positive toward and intend to perform has a great deal of intuitive appeal. Of course, individuals do not always choose, nor are they always able to act in ways that are consistent with their

intentions (Ajzen 1988; Bagozzi and Warshaw 1990; Grube and Morgan 1990; Liska 1984; Wright 1998).

Models with this rationality component work best for intentional behaviors that are premeditated and logical, such as a married couple's planned fertility behavior. However, behaviors that are not goal-oriented or rational are also common, even within the realm of childbearing. Unintended childbearing, by definition, does not fulfill individuals' or couples' goals of delaying or avoiding childbearing. Others have suggested, for example, that adolescent sexual intercourse is often spontaneous rather than planned (e.g., Brooks-Gunn and Furstenberg 1989). Models that assume behavior is rational and intentional may have limited contributions to make to our understanding of unintended childbearing, which by definition is unplanned.

The Prototype/Willingness model, on the other hand, was designed specifically to apply to unplanned behaviors, such as adolescent smoking (Gibbons et al. 1998). In this model, behavior is socially reactive not rationally planned. The model makes three key assumptions about behavior, which can be applied to childbearing: (1) it is volitional (within one's control), but not necessarily rational or intentional; (2) it is social, in that it requires the cooperation of a partner; and (3) it has clear social images associated with it. The nonintentional component is called "behavioral willingness," and the images associated with behavior are called "prototypes."

The Prototype/Willingness model has been applied to adolescent childbearing – for example, the extent to which a teen's image of the typical or "prototype" unwed teenage parent is positively related to willingness to engage in unprotected sex, independent of intentions to use contraception (Gibbons et al. 1995). Rather than behavioral intentions, this model focuses on behavioral expectations and behavioral willingness. Although individuals may not intend to engage in risky behaviors, they may find themselves in situations where the opportunity to do so arises. Applied to unintended childbearing, then, rather than ask, "Do you intend to have a birth?" this model asks, "Would you be willing to engage in sexual intercourse without contraception?" The primary distinction here is the reactive rather than deliberate nature of the decision (Gibbons et al. 1995). Similar to the reasoned action and planned behavior models, perceptions that others engage in the behavior and would approve of the behavior (subjective norms), as well as positive attitudes toward the behavior, increase intentions to engage in the behavior. In the prototype/willingness model, however, the focus is on willingness, and positive attitudes toward prototypes increase willingness.

The model can be summarized as follows: positive perceptions of norms, positive attitudes/beliefs/preferences, and positive prototypes increase behavioral expectations and behavioral willingness, which in turn increase the probability of the behavior. In addition, these attitudinal aspects of another domain, activities that compete with the behavior in question, are important as well (Barber 2001a). Because of its focus on unplanned risky behaviors, this model has great potential to contribute to our understanding of unintended childbearing.

One of the major obstacles to scientific research on unintended pregnancy is the *measurement* of unintended pregnancy and related behaviors. Most study designs, such as that used in the National Survey of Family Growth (NSFG), feature a single cross-sectional interview with lifetime retrospective reporting of pregnancy, intentions, and related behaviors. Methodological research on surveys suggests that recall errors will be substantial and significant (Groves et al. 2001; Schwarz and Sudman 1994; Sudman et al. 1996). This retrospective reporting severely limits the extent to which these studies can measure temporal dynamics in relationship characteristics or contraceptive use.

Longitudinal studies, which interview the same young women multiple times, address some potential shortcomings of the cross-sectional measures. The National Longitudinal Study of Adolescent Health (Add Health), the National Longitudinal Survey of Youth (NLSY), and the National Survey of Families and Households (NSFH) are all important alternatives to the cross-sectional measures of unintended pregnancy and related behaviors. Multiple interviews with the same young women at multiple times allow measurement of intentions, contraception, happiness about pregnancy, and relationship characteristics at one time point, followed by subsequent measurement of pregnancy. This design greatly reduces the risk of retrospective reporting error. Unfortunately, even in these designs, lengthy gaps between interviews greatly increase the chance of changes in the immediate context of pregnancy and retrospective reporting errors about that context. Without very frequent re-interviews, it is impossible to fully capture the temporal dynamics in intentions, contraception, attitudes toward pregnancy, and relationship characteristics.

To address the critical limitations in existing measures of unintended pregnancy, we are conducting a study that intensively and frequently measures these key processes. Specifically, we are collecting weekly, journal-based attitudinal and behavioral measures of pregnancy, relationships, and contraceptive use. These measures reduce the retrospective reporting period to

one week, and capture the dynamics in attitudinal and behavioral aspects of relationships and contraceptive use during the early adult years, when both the instability and the risk of unintended pregnancy are at their peak. We use these fully dynamic measures in the current paper to allow us to examine the intervening mechanisms that may explain the overall relationship between attitudes and pregnancy.

We draw on the proximate determinants of fertility framework to investigate two mechanisms to explain the influence of attitudes on pregnancy rates – contraception and sexual intercourse. Bongaarts identifies four proximate determinants, through which all less proximate factors must affect fertility: exposure to sexual intercourse, contraceptive use and effectiveness, abortion, and postpartum infecundability (Bongaarts 1982). We focus here on sex and contraceptive use. Postpartum infecundability is not a factor because we are examining first pregnancy, and abortion is not a factor because we are examining pregnancies rather than births. Research on unintended childbearing in the United States has found that early sex and low rates of contraceptive use are key determinants of unintended pregnancy. We expect exposure to sex and variance in contraceptive use to be important proximate determinants of unintended pregnancy in this setting and age group.

We have three goals in this paper. First, to assess the relationship between a very wide array of attitudinal measures and early pregnancy. This will allow us to explore which types of attitudinal measures are predictive of early pregnancy. Second, we explore the proximate determinants that explain the relationship between attitudes and pregnancy. We ask whether young women with different attitudes also differ in terms of sexual and contraceptive behavior, and whether those differences explain the differences in pregnancy rates. Finally, in the current version of the paper we speculate about the two types of theoretical models described above. In subsequent versions of the paper, we will more formally test these models.

DATA AND METHODS

Study Design

Our sample consists of young women, ages 18-19, residing in a Michigan county. Their names and contact information were obtained from public records. The study focused on this narrow age group because women age 18 through 21 have the highest risk of unintended pregnancy. An initial 60-minute face-to-face baseline survey interview was conducted to assess

important aspects of their family background; demographic information; key attitudes, values, and beliefs; current and past friendship and romantic relationships; education; and career trajectories. Once the baseline interview was completed, all respondents were invited to participate in the weekly journal-based study. The journal is a weekly mixed mode (internet and phone) survey. Each week respondents choose to complete the journal by logging into the study's secure website or by calling a toll-free number and completing the journal with a live interviewer. The journal period for each respondent is approximately 2.5 years, during which each respondent completes approximately 130 journals. Respondents are paid \$1 per weekly journal with \$5 bonuses for on-time completion of five weekly journals in a row. Automated email and text messages are sent to respondents weekly to remind them to complete the journals. If a respondent becomes late on her next journal, study staff first attempt to contact her by phone, and later by email and letter in attempt to regain her participation. Respondents who become 60 or more days late are offered an increased incentive for completing the next journal. Small gifts (e.g., pen, chapstick, compact, pencil) are also given to respondents to award continued participation.

We have completed all 1,003 baseline interviews and have thus far collected 36,042 weekly journals (between one and one hundred three per woman, depending on the baseline interview date). Our incentive scheme, coupled with the cooperative nature of this age group and their interest in the subject matter, has resulted in extremely high cooperation rates – an 83% response rate and a 94% cooperation rate for the baseline interviews. Over 99% of respondents who completed a baseline interview enrolled in the weekly journal portion of the study (N=992), and weekly journal participation rates have thus far been high. To date, almost 60% of respondents have completed a journal in the past 30 days.

MEASURES

Pregnancy

We operationalize a pregnancy as the report of a positive pregnancy test in the weekly journal. Respondents are first asked whether it is possible that she might be pregnant. If she answers yes, she is asked if a pregnancy test has indicated that she is pregnant.

Baseline Controls

Sociodemographic characteristics. Sociodemographic characteristics measured at the baseline interview are included as controls in the current analysis. Age is coded in years and ranges from 18 to 20 years; the reference category is 18 years old. Race is included as a dichotomous indicator for African American versus non-African American. School enrollment is created using information about the type of school in which the respondent is enrolled and the highest grade completed, resulting in the following categories: 1) not enrolled and did not graduate high school, 2) not enrolled and did graduate high school, 3) enrolled in high school, 4) enrolled in a two year college/vocational/technical/other, and 5) enrolled in a four year college. Four year college is the reference category. A respondent is coded as receiving public assistance if she identified ever receiving at least one of the following: 1) WIC, 2) FIP, 3) cash welfare, or 4) food stamps. Importance of religion is included as a continuous measure ranging from not important (1) to more important than anything else (4). A dichotomous measure indicating whether the respondent is currently living with a romantic partner is also included. Mother's age at first birth is included as a dichotomous measure indicating that the respondent's mother had her first child when she was younger than 20. Family structure is based on information about who the respondent lived with while growing up and includes the following three categories: 1) both biological parents or biological parent and step-parent, 2) single biological parent only, and 3) other situations. Two-parent family (biological or biological and step) is the reference category. Mother's education is coded as a dichotomous indicator for less than high school or otherwise. Low parental income is operationalized as \$14,999 or less; a dummy for don't know or refused is also included.

Prior sexual, contraceptive, and pregnancy experiences. Sexual, contraceptive, and pregnancy experiences as of the baseline interview are also included as controls. Indicators for early sexual debut (less than or equal to 14) and average sexual debut (15 or 16 years old) are included as dummy variables in the regression models. Lifetime number of sexual partners is continuous. Respondents who have ever had sex without using birth control are coded 1 and 0 otherwise. Prior pregnancy experience is included as a three category variable: 1) no prior pregnancies, 2) one prior pregnancy, and 3) two or more prior pregnancies. No prior pregnancies is the reference.

Perceived Norms

Prevalence. Respondents were asked a series of questions designed to measure perceptions of the prevalence of sex, contraceptive use, and pregnancy among friends. A question about the prevalence of single motherhood in the respondent's community was also asked. These questions are coded from 1 to 5 (none, a few, some, many, or almost all of them).

How many of your friends...

1. ...have had sexual intercourse?
2. ...are using birth control?
3. ...have had sexual intercourse without using birth control?
4. ...have gotten pregnant?
5. ...are parents?
6. How many women in your community are single parents?

We also created an averaged index capturing perceptions of prevalence for the six measures above. Prior to creating the index, the second prevalence measure was recoded so for all six measures a high score represents higher prevalence of sex, nonuse of birth control, pregnancy, and parenthood.

Approval. Questions designed to measure individuals' perceptions of how parents and friends would react to various behaviors related to sex, contraceptive use, and pregnancy were also asked. These questions are coded from 0 to 5 where 1 is not at all positively and 5 is extremely positively.

How would your friends react if you...

1. ... had sexual intercourse?
2. ...were using birth control?
3. ...had sexual intercourse without using birth control?
4. ...got pregnant?
5. ...had a baby?

How would your parents react if...

1. ...they found out that you had sexual intercourse?
2. ...you were using birth control?
3. ...you had sexual intercourse without using birth control?
4. ...you got pregnant?
5. ...you had a baby?

An averaged index was created for both friends' and parents' approval. Each index is composed of the five corresponding measures. Prior to creating the indices, the second approval measure in

each was recoded so for all five measures a high score represents higher approval of sex, nonuse of birth control, pregnancy, and parenthood.

Behavioral Control

Behavioral control questions were designed to measure the extent to which the respondent perceives that she is in control of sexual situations and the use of birth control in those situations. There are four questions and they are coded from 0 to 100, where 0 means there is absolutely no chance, and 100 means it is absolutely sure to happen. An averaged index was created from the measures as well.

1. Imagine that you were with a partner who wanted to have sexual intercourse but you did not. What are the chances that you could stop your partner from having sex with you?
2. If you decided to have sex, what are the chances that you could get your partner to withdraw or “pull out” before ejaculating or coming?
3. If you decided to have sex, what are the chances that you could get your partner to use a condom?
4. Imagine being with a partner and you both want to have sexual intercourse, but you have no birth control available. What are the chances that you could stop yourself once you were highly aroused or turned on?

Prototypes

Respondents were asked questions designed to measure perceptions about the typical type (or prototype) of person who engages in behaviors related to contraceptive use and pregnancy. These questions ask respondents to rate the typical person who engages in a specific behavior as “not at all” through “extremely” in terms of three adjectives (careless, cool, intelligent). These questions are coded from 1 to 5.

What do you think about young women your age who keep a condom in their purse, just in case?

1. Would you say they are not at all, somewhat, fairly, very, or extremely intelligent?
2. How about careless?
3. How about cool?

Ok, now what do you think about young women your age who have sexual intercourse with no birth control?

1. Would you say they are not at all, somewhat, fairly, very, or extremely intelligent?
2. How about careless?
3. How about cool?

Ok, now what do you think about young women your age who get pregnant?

1. Would you say they are not at all, somewhat, fairly, very, or extremely intelligent?
2. How about careless?
3. What about cool?

An averaged index was created for each behavior. Each index is composed of the three corresponding measures. Prior to creating the indices, the second adjective measured in each was recoded so for all three measures a high score represents more positive attitudes toward the prototype.

Desires

Desires within the next year to have sex and use birth control were measured. Also, desires within the next month to become pregnant and to avoid pregnancy were measured. These questions are coded from 0 to 5 where 1 is “not at all” and 5 is “extremely”.

1. How much do you want to have sexual intercourse in the next year?
2. If you do have sexual intercourse in the next year, how much would you want to use some type of birth control?
3. You know, getting pregnant and having a baby is a big event, one that has a lot of consequences. Most people your age have some positive and some negative feelings about getting pregnant and having a child. For this reason we are going to ask you first how much you want to get pregnant, using a scale from 0 to 5. Then we are going to ask you how much you want to avoid getting pregnant, using a scale from 0 to 5. First, how much do you want to get pregnant during the next month? Please give me a number between 0 and 5, where 0 means you don't at all want to get pregnant and 5 means you really want to get pregnant.
4. And next, how much do you want to avoid getting pregnant during the next month? Please give me a number between 0 and 5, where 0 means you don't at all want to avoid getting pregnant and 5 means you really want to avoid getting pregnant.

An averaged index was created for desires. Prior to creating the index, the second and fourth measures were recoded so for all four measures a high score represents a stronger desire for behaviors compatible with pregnancy and for pregnancy itself.

Willingness to Take Risks

Respondents were asked to assess whether they would be willing to engage in various risky behaviors that lead to pregnancy. A scenario was described and the respondent was asked to give a number between 0 and 5, where 0 means not at all willing and 5 means extremely willing.

After recoding the first measure, an average index was also created. A high score on the index represents more willingness to have sex regardless of the circumstances.

1. Imagine being with a partner who wants to have sex, but you do not. How willing would you be to refuse to have sex with your partner, even if it made him angry?
2. Imagine being with a partner who wants to have sexual intercourse, and you want to have sex, but you have no birth control available. How willing would you be to have sex without birth control?

Expectations

Expectations for the next year about behaviors related to sex, contraceptive use, and pregnancy were measured. These questions asked respondents to give a number from 0 to 100, where 0 means absolutely no chance of the behavior and 100 means the behavior is absolutely sure to happen.

What are the chances that you will...

1. ...have sexual intercourse in the next year?
2. ...have sexual intercourse without birth control during the next year?
3. ...get pregnant during the next year?

An averaged index capturing expectations was created. The index is composed of the three measures above.

General Attitudes

Respondents were given statements about sex, contraception, pregnancy, children, and marriage and were asked if they strongly agree, agree, disagree, or strongly disagree with the statements. Although the category was not offered by the interviewer, respondents could also provide a response of neither agree or disagree at the baseline interview. (This option was not provided when the questions were measured again in the journal.) These measures are coded 1 if the respondent agreed or strongly agreed with the statement. All other response are coded 0.

Sex.

1. Young people should not have sex before marriage.
2. It is alright for young people to have premarital sex even if they are just friends.
3. If a girl has been seeing a guy for a while, she should have sex with him.
4. You are not ready to have a sexual relationship with anyone.
5. If you had sexual intercourse now, you would feel guilty.

Contraception.

1. If a woman asks her partner to use a condom, he will think that she doesn't trust him.
2. Using birth control is morally wrong.
3. In general, birth control is too much of a hassle to use.
4. Using birth control is likely to make a woman feel sick.
5. Using birth control interferes with sexual enjoyment.
6. If a girl uses birth control, she is looking for sex.
7. In general, birth control is too expensive to buy.
8. It takes too much planning ahead of time to have birth control on hand when you're going to have sex.
9. It is easy for you to get birth control.
10. You can't afford to pay for birth control.

Pregnancy.

1. It is better to get pregnant young because young women's bodies recover faster.
2. It is easier for young women to lose weight after a pregnancy.
3. If a woman waits for the perfect time to have a baby, she will probably have trouble getting pregnant.
4. It is alright for a woman to have a child without being married.
5. Getting pregnant at this time in your life is one of the worst things that could happen to you.
6. If you had a baby now, you would feel less lonely.
7. If you got pregnant now, you could handle the responsibilities of parenting.
8. If you got pregnant now, you would be forced to grow up too fast.
9. If you got pregnant now, you would have to quit school.
10. If you got pregnant now, your partner would be happy.
11. If you got pregnant now, you could not afford to raise the child.
12. If you got pregnant now, your family would help you raise the child.
13. It wouldn't be all that bad if you got pregnant at this time in your life.

Children.

1. It is better to have kids young because the grandparents can be more involved.
2. Being a mother and raising children is the most fulfilling experience a woman can have.
3. It is hard for kids to have the oldest parents at their school.
4. Babies born to older mothers have more health problems.
5. Children cause worry and emotional strain for their parents.
6. Relationships between men and women improve after they have a baby together.

We created an averaged index for each set of measures above to capture attitudes toward sex, birth control, pregnancy, and children. When appropriate, measures were recoded prior to creating the indices so for all a high score represents more positive attitudes toward sex, birth control, etc.

Respondents were also asked about time spent with children and how much it would bother them if they never had children. These questions are coded from 0 to 5 where 1 is “not at all” and 5 is “extremely”. These measures were also averaged to create an index.

7. How much do you enjoy taking care of little children?
8. How experienced are you at caring for children?
9. Suppose your life turned out so that you never had children, how much would that bother you?

Perceived Infertility

Questions designed to measure individuals’ perceptions of their own fertility were asked at the baseline interview. These questions are coded 1 for a “yes” response and 0 for a “no” response and were averaged to create an index as well.

1. Has a doctor ever told you that you may not be able to get pregnant?
2. Do you think that you might not be able to get pregnant [again]?

Mediators

The mechanisms we expect will explain much of the relationship between our independent variables of interest and pregnancy include sex and the use of perfect birth control. We created cumulative measures for each which are the proportion of journals in which sex was reported with a partner and the proportion of journals in which perfect birth control use was reported. The cumulative sex measure is based on two weekly journal questions. The first asks, “In the past ___ days, did you have sexual intercourse with [Partner Name]? By sexual intercourse, we mean when a man puts his penis into a woman’s vagina.” The second asks, “In the past ___ days, did you have sexual intercourse with anyone other than [Partner Name]?” A “yes” response to one or both of these questions is coded 1; others are coded 0. The proportion of the “yes” responses at and prior to the journal is calculated to create a time-varying indicator of the proportion of previous weeks (in the journal) that the respondent had sex. This is computed at the time of each journal – in other words, it is time-varying. The cumulative perfect birth control measure is based on a weekly journal question that asks, “In the past ___ days¹, did you or your partner(s) use some method of birth control every time you had intercourse (even if you are

¹ The number of days that fills in both the sex and birth control questions is the number of days since the last journal, unless 14 or more days had past in which case the question only asks about the past 7 days.

not trying to prevent pregnancy)? This could be a method you mentioned earlier, or a method you haven't mentioned such as condoms, pills, or another method." A "yes" response is coded 1; others are coded 0. We consider weeks in which the respondent abstained as perfect contraception. The proportion of the "yes" responses at and prior to the journal is calculated to create the cumulative perfect birth control use measure at each journal. These mediating measures of sex and perfect birth control are -timed to two weeks prior to the dependent variable in order to measure the accumulation of these characteristics *up to* the sexual intercourse that resulted in the pregnancy.

ANALYTIC STRATEGY

We use event history methods to model the risk of pregnancy. Because the data are precise to the week, we use discrete-time methods to estimate these models. Person-weeks of exposure are the unit of analysis. We consider women to be at risk of pregnancy during all weeks they report that they are not currently pregnant. Although using person-weeks of exposure to risk as the unit of analysis substantially increases the sample size, Petersen (1986, 1991) and Allison (1982, 1984) have shown that using discrete-time methods does not deflate the standard errors and thus provides appropriate tests of statistical significance. Furthermore, because the probability of becoming pregnant is so small within each week, the estimates obtained using discrete-time methods are similar to those that would be obtained using continuous methods. In addition, because the probability of becoming pregnant is so small within each week, the hazard of pregnancy is similar to the pregnancy *rate*. Thus, in the text that follows we sometimes refer to the effects of the covariates on the pregnancy rate.

Almost all of the attitude measures we investigate in this paper are time-varying – the measures were collected at baseline and in the journal. The only exceptions are a few of the measures of general attitudes and the infertility measures (noted in the results and tables). Our time-varying measures of respondents' attitudes are measured three weeks prior to the current week of pregnancy status, in order to measure these characteristics *prior to* the sexual intercourse that resulted in the pregnancy. In other words, all time-varying attitude measures are lagged by three weeks. We adopt this strategy to guard against reciprocal causation. For instance, a young woman's recent discovery that she is pregnant may change her beliefs about the risks associated with having unprotected sex. Of course, a couple's sexual and contraceptive behavior may be

important predictors of young women's attitudes, and thus the reciprocal causation problem is not completely solved by the use of the time lag.

Descriptive statistics of the variables used in the analyses are provided in Table 1. In tables 2-5, we estimate models of each attitude measure in a separate model to provide an overall picture of which attitudes are related to pregnancy. That is, each cell in tables 2-5 represents an individual logistic regression model. Only the coefficient and standard error of the attitude is presented; however, all models include time-fixed control variables (measured at baseline) for sociodemographic characteristics, family background, prior sexual, contraceptive, and pregnancy experience, and journal number. First, we estimate models with each individual attitude measure. Second, we add our measure of sexual activity (proportion of observed weeks in which the respondent had sexual intercourse). Third, we remove the sexual activity measure and add the proportion of journals in which the respondent used perfect birth control. Finally, we estimate the models with both of these mediating measures. Base models were also estimated with only the mediating and control measures (presented in appendix).

RESULTS

Table 2 shows the relationships between measures of perceived norms and the hazard of pregnancy. Overall, Table 2 suggests that perceived norms are strongly related to the risk of pregnancy. This table presents two types of perceived norms – perceptions about *prevalence* and perceptions about *approval*. Respondents' perceptions about whether pregnancy and related behaviors are prevalent among their friends do not predict whether they become pregnant in the near future. However, their perceptions of their friends' approval, as well as their parents' approval, strongly predict their risk of pregnancy. Those who perceive that a positive reaction to pregnancy is likely from their friends and parents have higher pregnancy rates than those who perceive a likely negative reaction. Columns 2 through 4 suggest that the effect of friends' approval is explained in large part by sexual and contraceptive behavior. Those whose friends approve of pregnancy and childbearing have higher sexual frequency and less effective contraceptive use, which results in a higher pregnancy rate. Parental approval of sex without contraception, pregnancy, and childbearing, however, is not explained by sexual or contraceptive behavior. Some other mechanism must explain this relationship.

Table 3 focuses on behavioral control, prototypes, desires, willingness to take risks, and expectations. These measures of behavioral control – the extent to which the young woman believes she can control the factors leading to pregnancy, such as getting a partner to use the withdrawal method in the absence of other contraception – are not related to pregnancy. Prototypes, however, are significantly related to the risk of pregnancy. The extent to which young women positively perceive those who have sex without birth control and/or who get pregnant is associated with a higher pregnancy rate. About 35% of the magnitude of the sex without birth control prototype index is explained by contraceptive behavior – in other words, those who positively perceive other young women who have sex without birth control have higher pregnancy rates in part because they use less effective contraception themselves. (None of this effect is explained by sexual behavior.) Approximately 10% of the pregnancy prototype index is explained by sexual behavior, and approximately 31% is explained by contraceptive behavior. In other words, those who positively perceive their peers who become pregnant are more likely to become pregnant themselves in part because they have higher sexual frequency and in large part because they are less effective contraceptors.

Young women's desires to have sex and get pregnant are associated with higher pregnancy rates, and their desires to use birth control and avoid pregnancy are associated with lower pregnancy rates. The relationship between desire for sex and pregnancy is largely explained (71% reduction in magnitude) by sexual behavior (contraceptive behavior explains an additional small percentage). Not surprisingly, the relationship between the desire to use birth control and pregnancy is largely explained (36% reduction) by contraceptive behavior. Desires for pregnancy and for avoiding pregnancy are explained by both sexual behavior and contraceptive use, with slightly larger reductions in magnitude when including contraceptive behavior in the models.

Willingness to have sex without birth control is associated with a higher pregnancy rate, which is explained by both sexual behavior and contraceptive use. In other words, young women who report that they are willing to have sex without any birth control have higher pregnancy risk, both because they are more likely to have sex and because they are less likely to be effective contraceptors.

Finally, young women's perceptions that they are likely to have sex, have sex without birth control, and become pregnant are associated with higher pregnancy rates. Similar to desires,

expectations about sex are largely explained by sexual behavior, expectations about contraception are explained by contraceptive behavior, and expectations about pregnancy are explained by both.

Table 3 paints a picture of these largely unintended teen pregnancies as emerging from a set of attitudes, desires, and expectations that facilitate sexual intercourse and inhibit contraceptive use. Although willingness to have sex without birth control is a significant predictor of pregnancy, it is not particularly large, and our measure of willingness to *refuse* sex is not related to pregnancy.

Table 4 presents models of a host of general attitudes toward sex, contraception, pregnancy, and children, and their relationship to pregnancy rates. The specific measures of attitudes toward sex that are predictive of pregnancy are focused on readiness for sex – whether the young woman feels ready for sex, and whether she would feel guilty after having sex. The relationship between these measures and risk of pregnancy is largely explained by sexual behavior. Young women who feel that they are not ready for sex, or would feel guilty after having sex, have lower risk of pregnancy because they have less sex than their otherwise similar peers. Our measures of attitudes related to the morality of having sex before marriage or the obligation to have sex with a long-term boyfriend do not predict pregnancy.

The specific measures of attitudes toward birth control that predict pregnancy are specific to whether young women perceive that having birth control available represents a hassle. Young women who perceive birth control is a hassle or requires too much planning have higher risk of pregnancy. To the extent that this is explained by the available measures of mediating factors, contraceptive behavior plays a role, but sexual behavior does not. In other words, young women who think birth control is a hassle are less effective contraceptors. Interestingly, they also appear to be slightly less sexually active, which in turn *reduces* their risk of pregnancy. This is illustrated in column 2, where the magnitude of the effect of the attitude measures increase slightly in the models that include measures of sexual behavior.

We observe higher rates of pregnancy among young women who feel that it is better for weight loss to get pregnant young, who feel that getting pregnant now would *not* be “the worst thing”, that they could handle parenting, would *not* have to quit school, could afford the child, and that their partner would be happy if they became pregnant. The effects of each of these general attitudes toward pregnancy are explained by both sexual and contraceptive behavior. One

exception is that young women who feel that they would have to quit school if pregnant have lower pregnancy rates, but they are actually slightly less likely to use effective contraception. And, young women who feel that they could not afford to have a baby are actually slightly more sexually active.

Positive attitudes toward children are also associated with higher rates of pregnancy. Specifically, the belief that the relationship between the parents tends to improve after a birth is associated with a higher pregnancy rate. Further, the index combining that measure with other specific measures (that are not statistically significant predictors of pregnancy) is strongly related to pregnancy rates. This measure, however, is largely unexplained by sexual and contraceptive behavior. Finally, young women who enjoy and have experience taking care of children have higher pregnancy rates. This is explained somewhat by sexual and contraceptive behavior, such that young women who enjoy taking care of children are more sexually active while those who have experience taking care of children use contraception less effectively and thus both experience higher pregnancy rates.

Young women who think they may be infertile have higher pregnancy rates. This is explained, in part, by contraceptive use – not surprisingly, young women who think they may be unable to get pregnant are less effective contraceptors. However, they are also less sexually active. This is an interesting finding that deserves further study. Other measures of perceived infertility are not related to the pregnancy rate.

Summary and Discussion

In sum, we find a wide range of attitudinal measures that predict pregnancy rates among young women. Particularly strong and consistent predictors include perceptions of friends' and parents' approval of pregnancy and related behaviors; positive perceptions of others who become pregnant and engage in related behaviors; desires, willingness, and expectations to become pregnant and engage in related behaviors; general attitudes toward pregnancy and related behaviors, particularly attitudes that the respondent is not ready for sex, birth control is a hassle, and pregnancy has negative consequences; positive attitudes toward caring for children; and the respondent's perception that she may be unable to become pregnant.

Overall, attitudinal measures that are related to sexual behavior are explained by actual sexual behavior, measures that are related to contraceptive use are explained by contraceptive

behavior, and attitudes that are not limited to sex or contraception tend to be explained by both behaviors.

Finally, we find general support for two broad types of attitude-behavior models described in the literature. First, rational models that posit a direct link between wanting to become pregnant (and have a baby) and actually becoming pregnant are indirectly supported by our exploratory models. Second, models that posit an irrational component to behavior – whereby young women do not plan to engage in sexual intercourse without contraception, but do so anyway, are also indirectly supported by our models. Respondents' reports that they would be willing to have sex, even if they did not want to become pregnant but no birth control were available, is a strong predictor of pregnancy.

NEXT STEPS

Our next step with this manuscript is to more fully test the two types of theoretical models described above. We plan to implement structural equation models to further elucidate the pathways among which attitudinal factors are related to one another and to pregnancy. In addition, we will further test and refine our measures of the mediating factors, sexual behavior and pregnancy.

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Table 1. Descriptive Statistics of Measures Used in the Analyses

	N	Mean	Std. Dev.	Minimum	Maximum
Journal Measures					
Pregnancy	29936	.00		0	1
Baseline Control Measures					
Sociodemographic Characteristics					
Age					
18 years old	844	.42		0	1
19 years old	844	.49		0	1
20 years old	844	.08		0	1
African American	844	.33		0	1
School enrollment and type					
Not enrolled and did not graduate	844	.08		0	1
Not enrolled and did graduate	844	.21		0	1
High school	844	.14		0	1
2 year college/vocational/technical/other	844	.29		0	1
4 year college	844	.29		0	1
Receiving public assistance	844	.23		0	1
Religious importance	844	2.69	.92	1	4
Living with romantic partner	844	.14		0	1
Biological mother less than 20 years old at first birth	844	.35		0	1
Family Structure					
Biological parents/biological and step parent	844	.54		0	1
One biological parent only	844	.38		0	1
Other	844	.08		0	1
Mother's education less than high school graduate	844	.08		0	1
Parent's income					
\$14,999 or less	844	.14		0	1
\$15,000 or greater	844	.68		0	1
Don't know/Refused	844	.19		0	1
Sexual, Contraceptive, and Pregnancy Experiences					
Age at first sex					
14 years or less	844	.16		0	1
15-16 years	844	.35		0	1
17 years or greater/never had sex	844	.50		0	1
Lifetime number of sexual partners	844	3.25	4.90	0	57
Ever had sex without birth control	844	.45		0	1
Prior pregnancies					
0 prior pregnancies	844	.79		0	1
1 prior pregnancy	844	.14		0	1
2 or more prior pregnancies	844	.07		0	1
Journal Control Measures					
Proportion sex	29936	.33		0	1
Proportion perfect birth control use	29936	.63		0	1
Journal number	29936	30.20	20.48	4	103
Journal number squared	29936	1331.29	1657.78	16	10609
Baseline Attitude Measures					
General Attitudes					
Sex					
Not ready for sex	844	.46		0	1
Feel guilty after sex	844	.33		0	1
Birth Control					

Birth control easy to get	844	.88		0	1
Cannot afford birth control	844	.13		0	1
<i>Pregnancy</i>					
Pregnant now...					
...worst thing	844	.80		0	1
...less lonely	844	.12		0	1
...handle parenting	844	.43		0	1
...grow up too fast	844	.58		0	1
...quit school	844	.21		0	1
...partner happy	844	.26		0	1
...could not afford child	844	.65		0	1
...family would help	844	.87		0	1
...not that bad	844	.18		0	1
<i>Children</i>					
Enjoy taking care of children	844	3.85	1.34	0	5
Experienced at caring for children	844	4.01	1.19	0	5
Bother if never had children	843	3.65	1.66	0	5
Enjoy children index	844	3.84	1.06	0	5
Infertility					
Doctor told you that you may be infertile	820	.15		0	1
You think you may be infertile	843	.11		0	1
Infertility index	844	.13		0	1
<i>Journal Attitude Measures</i>					
Perceived Norms					
<i>Prevalence</i>					
How many of your friends...					
...have had sex	29932	3.98	1.18	1	5
...are using birth control	29875	3.15	1.13	1	5
...have had sex without birth control	29789	2.75	1.06	1	5
...have gotten pregnant	29936	2.21	1.02	1	5
...are parents	29936	2.13	.99	1	5
How many women in community single parents	29817	3.30	.93	1	5
Prevalence index	29936	2.87	.61	1	5
<i>Approval</i>					
How would your friends react if you...					
...had sex	29924	2.83	1.35	0	5
...were using birth control	29933	3.90	1.32	0	5
...had sex without birth control	29933	1.36	1.34	0	5
...got pregnant	29921	1.99	1.51	0	5
...had a baby	29924	2.42	1.58	0	5
Approval of friends index	29936	1.94	.86	0	5
How would your parents react if you...					
...had sex	29932	1.73	1.35	0	5
...were using birth control	29915	3.51	1.61	0	5
...had sex without birth control	29915	.73	1.24	0	5
...got pregnant	29932	1.26	1.45	0	5
...had a baby	29913	1.82	1.65	0	5
Approval of parents index	29936	1.41	.89	0	5
Behavioral Control					
What are the chances...					
...stop partner from having sex w/you	29931	83.58	25.89	0	100
...get partner to withdraw	29655	73.81	28.76	0	100
...get partner to use a condom	29836	90.23	21.21	0	100
...stop yourself once aroused	29817	74.06	28.85	0	100

Behavioral control index	29936	80.42	18.09	0	100
Prototypes					
Women your age who keep a condom are...					
...intelligent	29936	3.74	1.12	1	5
...careless	29930	1.71	1.04	1	5
...cool	29893	2.05	1.21	1	5
Condom prototype index	29936	3.36	.83	1	5
Women your age who have sex without birth control...					
...intelligent	29936	1.34	.71	1	5
...careless	29936	4.10	1.20	1	5
...cool	29930	1.21	.60	1	5
Sex without birth control prototype index	29936	1.48	.67	1	5
Women your age who get pregnant are...					
...intelligent	29863	1.80	.83	1	5
...careless	29896	3.36	1.21	1	5
...cool	29874	1.30	.63	1	5
Pregnancy prototype index	29936	1.92	.68	1	4.67
Desires					
Want sex next year	29862	2.56	1.82	0	5
Want to use birth control next year	29880	4.44	1.26	0	5
Want to get pregnant	29935	.22	.86	0	5
Want to avoid getting pregnant	29935	4.78	.84	0	5
Desires index	29936	1.13	.73	.25	5
Willingness to Take Risks					
Willingness to refuse sex, even if it made partner angry	29928	3.87	1.63	0	5
Willingness to have sex without any birth control	29924	1.40	1.54	0	5
Willingness index	29936	1.27	1.16	0	5
Expectations					
Likelihood of sex next year	29927	62.05	39.96	0	100
Likelihood of sex without birth control next year	29936	21.11	32.04	0	100
Likelihood get pregnant next year	29935	12.48	20.75	0	100
Likelihood index	29936	31.88	24.19	0	100
Ideal age to get married	29899	25.05	3.58	0	99
Ideal age to have a baby	29850	26.35	4.09	0	99
Ideal age index	29936	25.70	3.28	0	67
General Attitudes					
<i>Sex</i>					
Should not have sex before marriage	29936	.46		0	1
Premarital sex ok if attraction	29936	.22		0	1
Should have sex if seeing guy for a while	29936	.03		0	1
Attitudes toward sex index	29936	.38		0	1
<i>Birth Control</i>					
Condom a sign of mistrust	29936	.11		0	1
Birth control is morally wrong	29936	.04		0	1
Birth control is a hassle	29936	.07		0	1
Birth control makes you sick	29936	.25		0	1
Birth control interferes with sexual enjoyment	29936	.07		0	1
Girls who use birth control want sex	29936	.06		0	1
Birth control is expensive	29936	.13		0	1
Too much planning to have birth control	29936	.04		0	1
Attitudes toward birth control index	29936	.10	.14	0	.90
<i>Pregnancy</i>					
Better get pregnant young body recovers	29936	.27		0	1
Better get pregnant young lose weight	29936	.49		0	1

If wait for perfect time, hard to get pregnant	29936	.21	0	1
Ok to be single mom	29936	.59	0	1
Attitudes toward pregnancy index	29936	.42	0	1
<i>Children</i>				
Better have kids young for grandparents	29936	.29	0	1
Motherhood most fulfilling experience can have	29936	.68	0	1
Hard for kids to have oldest parents at school	29936	.24	0	1
Have baby young less health problems	29936	.42	0	1
Children cause worry	29936	.66	0	1
Relationship of parents improve after baby	29936	.26	0	1
Attitudes toward children index	29936	.37	0	1

Table 2. Logistic Regression Estimates of Effects of Perceived Norms on Hazard of Pregnancy

	Overall Effect	Effect Net of Sex	Effect Net of Perfect BC	Effect Net of Sex & Perfect BC
Perceived Norms				
<i>Prevalence</i>				
How many of your friends...				
...have had sex	.17+ (.12)	.05 (.13)	.09 (.12)	-.02 (.12)
...are using birth control	-.11 (.09)	-.11 (.09)	-.06 (.09)	-.03 (.09)
...have had sex without birth control	.12 (.09)	.08 (.10)	.07 (.09)	.02 (.10)
...have gotten pregnant	-.05 (.09)	-.10 (.09)	-.11 (.10)	-.14 (.09)
...are parents	.06 (.09)	-.00 (.09)	.02 (.09)	-.04 (.09)
How many women in community single parents	-.09 (.11)	-.09 (.12)	-.07 (.11)	-.06 (.11)
Prevalence index ^a	.16 (.17)	.04 (.17)	.03 (.17)	-.10 (.17)
<i>Approval</i>				
How would your friends react if you...				
...had sex	-.06 (.07)	-.12 (.08)	-.08 (.08)	-.13 (.08)
...were using birth control	-.08 (.07)	-.11+ (.07)	-.09 (.07)	-.10+ (.07)
...had sex without birth control	.07 (.07)	.07 (.07)	.04 (.07)	.03 (.07)
...got pregnant	.11* (.07)	.08 (.07)	.08 (.07)	.04 (.07)
...had a baby	.18** (.07)	.14* (.07)	.16* (.07)	.11+ (.07)
Approval of friends index ^a	.24* (.12)	.19+ (.12)	.18+ (.12)	.11 (.12)
How would your parents react if you...				
...had sex	.20** (.08)	.18* (.08)	.19** (.08)	.19** (.08)
...were using birth control	.06 (.08)	.01 (.08)	.05 (.08)	.01 (.08)
...had sex without birth control	.17** (.07)	.18** (.07)	.16** (.07)	.16** (.07)
...got pregnant	.16** (.06)	.15* (.06)	.14* (.06)	.12* (.06)
...had a baby	.19*** (.06)	.18** (.06)	.19*** (.06)	.16** (.06)
Approval of parents index ^a	.34*** (.10)	.34*** (.10)	.32*** (.10)	.31** (.10)

Notes: Each cell represents a logistic regression model. Coefficients are effects on log-odds. Standard errors in parentheses. All model X2 values are statistically significant at the .001 level. Slight differences in sample size exist for the models due to item-specific missing data (see Table 1).

All models include controls for sociodemographic characteristics, family background, prior sexual, contraceptive, and pregnancy experiences, and journal number.

All measures of perceived norms are time-varying and measured three weeks prior to the current week of pregnancy status.

All mediating measures are time-varying and measured two weeks prior to the current week of pregnancy status.

^a High score represents higher prevalence or approval of sex, unprotected sex, pregnancy, etc.

† p < .10; * p < .05; ** p < .01; *** p < .001 (one-tailed tests)

Table 3. Logistic Regression Estimates of Effects of Behavioral Control, Prototypes, Desires, Willingness to take Risks, and Expectations on Hazard of Pregnancy

	Overall Effect	Effect Net of Sex	Effect Net of Perfect BC	Effect Net of Sex & Perfect BC
Behavioral Control				
What are the chances...				
...stop partner from having sex w/you	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
...get partner to withdraw	.01 (.00)	.01 (.00)	.01 (.00)	.01 (.00)
...get partner to use a condom	.01 (.00)	.01 (.00)	.01 (.00)	.01 (.00)
...stop yourself once aroused	-.00 (.00)	-.00 (.00)	.00 (.00)	.00 (.00)
Behavioral control index	.01 (.01)	.01 (.01)	.01 (.01)	.01 (.01)
Prototypes				
Women your age who keep a condom are...				
...intelligent	.30 (.11)	.26 (.11)	.29 (.11)	.24 (.11)
...careless	-.02 (.11)	.02 (.11)	-.02 (.11)	.02 (.11)
...cool	.17 (.07)	.18 (.07)	.17 (.07)	.16 (.07)
Condom prototype index ^a	.36 (.14)	.33 (.14)	.35 (.14)	.31 (.14)
Women your age who have sex without birth control...				
...intelligent	.20+ (.12)	.21* (.13)	.11 (.13)	.09 (.13)
...careless	-.15* (.08)	-.17* (.08)	-.12+ (.08)	-.11+ (.08)
...cool	.16 (.13)	.17 (.14)	.07 (.14)	.07 (.14)
Sex without birth control prototype index ^a	.31* (.14)	.33** (.14)	.20+ (.14)	.19 (.15)
Women your age who get pregnant are...				
...intelligent	.19+ (.12)	.17+ (.12)	.16+ (.12)	.11 (.12)
...careless	-.13+ (.09)	-.13+ (.09)	-.08 (.09)	-.08 (.09)
...cool	.18+ (.14)	.15 (.14)	.13 (.14)	.10 (.14)
Pregnancy prototype index ^a	.32* (.15)	.29* (.16)	.22+ (.16)	.18 (.16)
Desires				
Want sex next year	.17** (.07)	.05 (.08)	.12* (.07)	.01 (.07)
Want to use birth control next year	-.14* (.07)	-.19** (.07)	-.09 (.07)	-.09 (.08)
Want to get pregnant	.32*** (.06)	.29*** (.06)	.26*** (.06)	.21** (.07)
Want to avoid getting pregnant	-.35*** (.06)	-.33*** (.06)	-.29*** (.06)	-.26*** (.06)
Desires index ^b	.59*** (.10)	.51*** (.10)	.46*** (.10)	.36*** (.11)
Willingness to Take Risks				
Willingness to refuse sex, even if it made partner angry	.05 (.06)	.04 (.06)	.05 (.06)	.05 (.06)
Willingness to have sex without any birth control	.14* (.07)	.09 (.07)	.08 (.07)	.01 (.07)
Willingness index ^c	.07 (.09)	.03 (.09)	.01 (.09)	-.05 (.10)
Expectations				
Likelihood of sex next year	.01** (.00)	.00 (.00)	.01* (.00)	.00 (.00)
Likelihood of sex without birth control next year	.01** (.00)	.01* (.00)	.00+ (.00)	.00 (.00)
Likelihood get pregnant next year	.01** (.00)	.01* (.00)	.01* (.00)	.00 (.00)
Likelihood index	.02*** (.00)	.01** (.01)	.01** (.00)	.00 (.01)

Notes: Each cell represents a logistic regression model. Coefficients are effects on log-odds. Standard errors in parentheses. All model X^2 values are statistically significant at the .001 level. Slight differences in sample size exist for the models due to item-specific missing data (see Table 1).

All models include controls for sociodemographic characteristics, family background, prior sexual, contraceptive, and pregnancy experiences, and journal number.

All measures of behavioral control, prototypes, desires, willingness to take risks, and expectations are time-varying and measured three weeks prior to the current week of pregnancy status.

All mediating measures are time-varying and measured two weeks prior to the current week of pregnancy status.

^a High score represents more positive attitudes toward prototype

^b High score represents stronger desire compatible with pregnancy

^c High score represents more willingness to have sex regardless of circumstances

† p < .10; * p < .05; ** p < .01; *** p < .001 (one-tailed tests)

Table 4. Logistic Regression Estimates of Effects of General Attitudes on Hazard of Pregnancy

	Overall Effect	Effect Net of Sex	Effect Net of Perfect BC	Effect Net of Sex & Perfect BC
<i>Attitudes toward sex</i>				
Should not have sex before marriage ¹	.21 (.24)	.44 (.24)	.33 (.24)	.54 (.24)
Premarital sex ok if attraction ¹	.05 (.25)	-.02 (.25)	-.08 (.25)	-.13 (.25)
Should have sex if seeing guy for a while ¹	.36 (.47)	.27 (.48)	.29 (.48)	.26 (.48)
Not ready for sex	-.49* (.26)	-.09 (.28)	-.41+ (.26)	-.09 (.27)
Feel guilty after sex	-.61* (.33)	-.31 (.34)	-.43+ (.33)	-.15 (.34)
Attitudes toward sex index ^{1, a}	.62 (.50)	-.17 (.55)	.26 (.51)	-.47 (.55)
<i>Attitudes toward birth control</i>				
Condom a sign of mistrust ¹	.09 (.27)	.12 (.27)	-.00 (.28)	-.04 (.28)
Birth control is morally wrong ¹	-.11 (.52)	-.02 (.52)	-.24 (.52)	-.16 (.53)
Birth control is a hassle ¹	.89*** (.27)	.92*** (.28)	.75** (.27)	.74** (.28)
Birth control makes you sick ¹	.08 (.22)	.02 (.22)	.01 (.22)	-.08 (.22)
Birth control interferes with sexual enjoyment ¹	.40 (.35)	.33 (.35)	.33 (.34)	.25 (.35)
Girls who use birth control want sex ¹	.29 (.39)	.37 (.39)	.12 (.40)	.19 (.40)
Birth control is expensive ¹	.25 (.27)	.16 (.27)	.14 (.27)	.02 (.28)
Too much planning to have birth control ¹	.72* (.39)	.80* (.39)	.60+ (.39)	.68* (.39)
Birth control easy to get	.25 (.41)	.19 (.41)	.35 (.42)	.41 (.43)
Cannot afford birth control	.01 (.33)	-.05 (.33)	-.04 (.34)	-.13 (.34)
Attitudes toward birth control index ^{1, b}	1.07+ (.66)	1.05+ (.68)	.65 (.69)	.44 (.72)
<i>Attitudes toward pregnancy</i>				
Better get pregnant young body recovers ¹	.00 (.25)	.02 (.25)	.01 (.25)	-.01 (.25)
Better get pregnant young lose weight ¹	.30+ (.21)	.32+ (.21)	.28+ (.21)	.30+ (.21)
Ok to be single mom ¹	-.10 (.23)	-.15 (.23)	-.21 (.23)	-.28 (.24)
Pregnant now...				
... worst thing	-.50* (.23)	-.41* (.24)	-.31+ (.24)	-.15 (.25)
... less lonely	-.18 (.32)	-.26 (.32)	-.17 (.32)	-.21 (.33)
... handle parenting	.54* (.25)	.50* (.25)	.46* (.26)	.36+ (.26)
... grow up too fast	-.08 (.22)	-.16 (.22)	-.04 (.22)	-.04 (.22)
... quit school	-.72* (.39)	-.64+ (.39)	-.75* (.39)	-.68* (.39)
... partner happy	.74*** (.22)	.67*** (.22)	.65** (.22)	.54** (.22)
... could not afford child	-.41* (.23)	-.45* (.23)	-.33+ (.23)	-.35+ (.23)
... family would help	-.16 (.27)	-.07 (.27)	-.12 (.27)	-.06 (.27)
... not that bad	.20 (.23)	.15 (.24)	.07 (.23)	-.07 (.25)

Attitudes toward pregnancy index ^{1, a}	1.39** (.57)	1.38** (.57)	1.08* (.57)	.91+ (.58)
<i>Attitudes toward children</i>				
Better have kids young for grandparents ¹	.14 (.23)	.10 (.22)	.16 (.23)	.11 (.23)
Motherhood most fulfilling experience can have ¹	.17 (.27)	.16 (.27)	.07 (.27)	.01 (.27)
Hard for kids to have oldest parents at school ¹	.18 (.23)	.19 (.23)	.22 (.23)	.24 (.24)
Have baby young less health problems ¹	.06 (.22)	.03 (.22)	.08 (.22)	.06 (.22)
Children cause worry ¹	-.15 (.21)	-.21 (.21)	-.14 (.21)	-.18 (.21)
Relationship of parents improve after baby ¹	.47* (.23)	.49* (.23)	.49* (.24)	.47* (.24)
Attitudes toward children index ^{1, a}	.89* (.51)	.91* (.51)	.90* (.51)	.85* (.51)
Enjoy taking care of children	.21* (.11)	.20* (.11)	.22* (.11)	.21* (.11)
Experienced at caring for children	.28* (.13)	.28* (.13)	.27* (.13)	.25* (.13)
Bother if never had children	.01 (.07)	-.01 (.07)	.01 (.07)	-.02 (.07)
Enjoy children index	.24* (.14)	.20+ (.14)	.24* (.14)	.19+ (.14)

Notes: Each cell represents a logistic regression model. Coefficients are effects on log-odds. Standard errors in parentheses. All model X^2 values are statistically significant at the .001 level. Slight differences in sample size exist for the models due to item-specific missing data (see Table 1).

All models include controls for sociodemographic characteristics, family background, prior sexual, contraceptive, and pregnancy experiences, and journal number. All mediating measures are time-varying and measured two weeks prior to the current week of pregnancy status.

¹ Time-varying and measured three weeks prior to the current week of pregnancy status. All others measured at baseline only.

^a High score represents more positive attitudes toward sex, pregnancy, children

^b High score represents more negative attitudes toward birth control

† p < .10; * p < .05; ** p < .01; *** p < .001 (one-tailed tests)

Table 5. Logistic Regression Estimates of Effects of Beliefs about Infertility on Hazard of Pregnancy

	Overall Effect	Effect Net of Sex	Effect Net of Perfect BC	Effect Net of Sex & Perfect BC
Infertility				
Doctor told you that you may be infertile	-.16 (.30)	-.11 (.30)	-.24 (.30)	-.12 (.30)
You think you may be infertile	.60* (.29)	.66* (.29)	.51* (.29)	.55* (.30)
Infertility index	.23 (.35)	.32 (.37)	.11 (.36)	.24 (.36)
If wait for perfect time, hard to get pregnant	-.13 (.24)	-.24 (.24)	-.16 (.24)	-.28 (.25)

Notes: Each cell represents a logistic regression model. Coefficients are effects on log-odds. Standard errors in parentheses. All model X2 values are statistically significant at the .001 level. Slight differences in sample size exist for the models due to item-specific missing data (see Table 1).

All models include controls for sociodemographic characteristics, family background, prior sexual, contraceptive, and pregnancy experiences, and journal number.

All measures of beliefs about infertility are measured at baseline only.

All mediating measures are time-varying and measured two weeks prior to the current week of pregnancy status.

† p < .10; * p < .05; ** p < .01; *** p < .001 (one-tailed tests)

Appendix 1. Base Models with Mediating and Baseline and Journal Control Measures on Hazard of Pregnancy

	Models			
	1	2	3	4
Mediating Measures				
Sex		1.44*** (.32)		1.59*** (.35)
Perfect Birth Control			-1.61*** (.31)	-1.68*** (.33)
Baseline Control Measures				
Sociodemographic Characteristics				
Age				
19 years old	.09 (.23)	.13 (.23)	.09 (.22)	.12 (.22)
20 years old	-1.04* (.61)	-.89+ (.61)	-.97+ (.61)	-.78 (.61)
African American	.17 (.28)	.33 (.28)	.01 (.28)	.12 (.28)
School enrollment and type				
Not enrolled and did not graduate	-.15 (.47)	-.12 (.47)	-.27 (.47)	-.28 (.47)
Not enrolled and did graduate	.67* (.34)	.58* (.33)	.46+ (.34)	.30 (.35)
High school	.49 (.39)	.47 (.39)	.43 (.39)	.36 (.39)
2 year college/vocational/technical/other	-.25 (.35)	-.27 (.35)	-.36 (.35)	-.40 (.35)
Receiving public assistance	.14 (.26)	.13 (.27)	.27 (.25)	.28 (.26)
Religious importance	-.06 (.13)	-.05 (.13)	.00 (.13)	.02 (.13)
Living with romantic partner	.62** (.25)	.32 (.26)	.54* (.26)	.21 (.27)
Biological mother less than 20 years old at first birth	.49* (.22)	.51* (.22)	.47* (.22)	.49* (.22)
Family Structure				
One biological parent only	.53* (.25)	.58** (.24)	.61** (.25)	.66** (.24)
Other	.27 (.37)	.27 (.38)	.49+ (.36)	.50+ (.37)
Mother's education less than high school graduate	-.13 (.36)	.06 (.36)	-.14 (.36)	.07 (.36)
Parent's income				
\$14,999 or less	.29 (.29)	.22 (.29)	.28 (.29)	.19 (.29)
Don't know/Refused	-.02 (.28)	.09 (.28)	-.04 (.28)	.02 (.28)
Sexual, Contraceptive, and Pregnancy Experiences				
Age at first sex				
14 years or less	.84* (.37)	.64* (.36)	.71* (.37)	.54+ (.36)
15-16 years	1.05*** (.31)	.92** (.30)	.88** (.31)	.78** (.30)
Lifetime number of sexual partners	.02+ (.01)	.02+ (.01)	.02 (.02)	.02 (.02)
Ever had sex without birth control	.39+ (.28)	.29 (.27)	.19 (.28)	.08 (.27)
Prior pregnancies				
1 prior pregnancy	.79** (.29)	.81** (.28)	.82** (.28)	.77** (.28)
2 or more prior pregnancies	1.12*** (.34)	1.21*** (.35)	.95** (.34)	1.06*** (.34)
Journal Control Measures				
Journal number	-.02 (.02)	-.01 (.02)	-.04* (.02)	-.02+ (.02)
Journal number squared	.00 (.00)	.00 (.00)	.00* (.00)	.00+ (.00)
-2 Log Likelihood	1172.57	1151.27	1143.2	1121.75
Df	24	25	25	26
Individuals	844	844	844	844
Observations	29936	29936	29936	29936

Notes: Each column represents a logistic regression model. Coefficients are effects on log-odds. Standard errors in parentheses. All model X^2 values are statistically significant at the .001 level.

† p < 0.10; * p < 0.05; ** p < 0.01; *** p < 0.001 (one-tailed tests)



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