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

Jennifer S. Barber, Heather Gatny, Yasamin Kusunoki, and Jennifer Yarger

Background and Significance

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).

Theoretical Framework

Behaviors and attitudes 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 similar to the teen's own self-image 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 prototypical similarity increases willingness. Prototypical similarity refers to the extent to which the individual perceives him or herself to be like the typical person who engages in the risky behavior.

The model can be summarized as follows: positive perceptions of norms, positive attitudes/beliefs/preferences, and prototypical similarity 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.

Each of these models is complicated by the fact that attitudes are dynamic; they change over time in response to both the forces of childhood socialization and everyday social experience (Azjen 1988; Mead 1934). The experiences most likely to produce these changes include dating and sexual relationships with the opposite sex, school, work, new living arrangements, and other forms of social interaction (Axinn and Barber 1997; Mead 1934; Morgan and Waite 1987; Schoen et al. 1997; Waite et al. 1986). New experiences in these domains occur at a high rate from ages 18-21 (Rindfuss 1991). As a result, it is quite likely that attitudes change rapidly in these ages. Our theoretical model predicts that changes in attitudes will produce changes in willingness, that in turn have the potential to produce changes in behavior.

Obstacles to Study Unintended Pregnancy

One of the major obstacles to scientific research on unintended pregnancy is the measurement of unintended pregnancy. 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. As a result, all measures of unintended childbearing are based on retrospective reporting of intention, contraception, happiness, and relationship status for pregnancies that occurred sometime before the interview, often years before the interview. Each

of these important dimensions is subject to somewhat different levels of retrospective reporting error, but methodological research on surveys suggests that these errors will be substantial and significant (Groves et al. 2001; Schwarz and Sudman 1994; Sudman et al. 1996). Of greatest concern is that individuals alter their feelings to become more consistent with behavior (Festinger 1957; Williams et al. 1999), which may produce substantial underestimates of the true level of unintended childbearing. A second, closely related concern is that retrospective reporting severely limits the extent to which these studies can measure temporal dynamics in intentions/attitudes, relationship characteristics, or contraceptive use. In other words, existing measures of intentions, relationships, and contraception are limited to a single referent time point per pregnancy and do not measure how behavioral, attitudinal, and contextual aspects of relationships and contraceptive use may change directly before or after a pregnancy.

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. 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, happiness toward pregnancy, and relationship characteristics. The costs

of face-to-face interviews prohibit frequent re-interviewing – an alternative strategy is a high scientific priority.

To address the critical limitations in existing measures of unintended pregnancy, we are conducting a study which intensively measures these key processes. Specifically, we are collecting weekly, electronic 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. An electronic data collection journal also provides the flexibility to add contingent measures, based on specific events. So, for example, as a new relationship begins and changes, we can measure the different relevant dimensions of that relationship, including physical intimacy and contraceptive use, time spent together, commitment, conflict, and exclusivity.

We believe that weekly measurement is the correct periodicity for several reasons. First, very frequent measurement is important to ensure accurate recall of coitus-specific methods, such as condoms. Second, NSFG Cycle 6 (2002) data suggest that more than 12% of women aged 18 to 22 years of age use multiple contraceptive methods per month, indicating high levels of instability and change. Third, previous diary studies suggest that high response rates are, in part, because the diary becomes part of the respondent's routine and is thus less likely to be forgotten (Halpern et al. 1994; Jaccard et al. 2004; Searles et al. 1995). Overall, a weekly measurement strategy balances the need for a routine with the costs of minimizing measurement error while not being overly-burdensome to respondents.

To advance our understanding of the processes leading to unintended pregnancy during the transition to adulthood, this paper investigates which attitudinal aspects of sex, contraception, and pregnancy influence the hazard of pregnancy. We begin our investigation by exploring models predicting the risk of first pregnancy. These models assess the independent effects general attitudes, perceived norms, beliefs, behavioral expectations and behavioral willingness (measured at the time participants are first enrolled into the electronic journal) have on pregnancy. In the final paper to be presented at the PAA conference, we will further develop our theoretical framework and will expand our analyses to include dynamic measures of the attitudes collected in the journal. We will also estimate the risk of first as well as subsequent reports of a pregnancy in the final paper. Finally, if the number of pregnancies reported in the journal permits us, we will investigate which of these attitudes influence the hazard of unintended pregnancy.

Data and Methods

Sample

Our sample consists of young women, ages 18-19, residing in a Michigan county. Their names and contact information have been obtained from public records. To be eligible in the recruitment phase of the study, the young women were no younger than 18 and no older than 19 at the time they were first sampled. We focused on this narrow age group because women age 18 through 21 have the highest risk of unintended pregnancy. The sample was drawn in four replicates, each of which is representative of the population. The dates at which each replicate entered the field are: 1) March 2008; 2) July 2008; 3) November 2008; and 4) March 2009.

Study Design

An initial 60-minute face-to-face 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 in-person 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 can choose to complete the survey either by logging into the study's secure website, or by calling a toll free number and completing the survey with a live interviewer. The survey period for each respondent is approximately 2.5 years, and during that time each respondent can potentially complete up to 183 surveys (if they complete a new survey every 5 days). Respondents are paid $1 per weekly survey with $5 bonuses for on-time completion of five weekly surveys in a row. Automated email and text messages are sent to respondents weekly to remind them to complete the surveys. If a respondent becomes late on her next survey, 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 survey. Small gifts (e.g., pen, chapstick, compact, pencil) are also given to respondents to award continued participation.

We have completed the baseline data collection in all four replicate samples and have 1003 baseline interviews and 23,252 weekly surveys (between one and seventy five per woman, depending on the baseline interview date). Our experience indicates that 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. We have an 83% response rate and a 94% cooperation rate for the baseline interviews and over 99% of respondents who completed a baseline interview enrolled in the weekly survey portion of the study (N=992). Furthermore, weekly survey participation rates have thus far been high. To date, almost 67% of respondents have completed a survey in the past 30 days.

Variable Description and Measurement

Pregnancy

We operationalize a pregnancy as the report of a positive pregnancy test. A respondent is coded 1 at the first survey where she reports a new pregnancy after the baseline interview and 0 otherwise. For example, a respondent whose first report of a pregnancy occurred at the tenth survey would be coded 0 for all surveys prior to the tenth and 1 for the tenth survey. All later surveys are dropped from the analysis. A respondent who has not yet reported a pregnancy would be coded 0 at all surveys and thus censored at the last survey she completed to date.

Baseline Controls

Sociodemographic characteristics. Several 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 the respondent is enrolled in and highest grade completed and includes the following categories: 1) not enrolled and did not graduate high school, 2) not enrolled and did graduate high school, 3) high school, 4) two year college/vocational/technical/other, and 5) four year college. Four year college is the reference category. A respondent is coded as receiving public assistance if she identified 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 (1/0). 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.

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. The category for no prior pregnancies is the reference.

General Attitude Measures

Respondents were read statements about sex, contraception, and pregnancy at the baseline interview 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. These questions are coded from 1 to 5 (strongly disagree, disagree, neither agree or disagree, agree, strongly agree).

Attitudes toward sex.

1. If a girl has been seeing a guy for a while, she should have sex with him.
2. You are not ready to have a sexual relationship with anyone.
3. If you had sexual intercourse now, you would feel guilty.

We also created an averaged index capturing attitudes toward sex. The index is composed of the three measures above. Prior to creating the index, the first attitude measure was recoded so for all three measures a high score represents more negative attitudes toward sex.

Attitudes toward pregnancy.
1. It is alright for a woman to have a child without being married.
2. Getting pregnant at this time in your life is one of the worst things that could happen to you.
3. If you had a baby now, you would feel less lonely.
4. If you got pregnant now, you could handle the responsibilities of parenting.
5. If you got pregnant now, you would be forced to grow up too fast.
6. If you got pregnant now, you would have to quit school.
7. If you got pregnant now, your partner would be happy.
8. If you got pregnant now, you could not afford to raise the child.

An averaged index capturing attitudes toward pregnancy was created as well. The index is composed of the eight measures above. Prior to creating the index, the second, fifth, sixth, and eighth attitude measures were recoded so for all eight measures a high score represents more positive attitudes toward pregnancy.

Measures of 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?

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 at the baseline interview. 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. …if you were using birth control?
3. …if you had sexual intercourse without using birth control?
4. …if you got pregnant?
5. …if you 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. …if you had sexual intercourse without using birth control?
4. …if you got pregnant?
5. …if you had a baby?

Measures of 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 (e.g., 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?

Measures of Expectations

Expectations for the next year about behaviors related to sex, contraceptive use, and pregnancy were measured at the baseline interview. 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?

Measures of Willingness

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.

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.

Analytic Strategy

We begin by estimating the dimensions of time-fixed general attitudes (measured at baseline) that have independent effects on the hazard of pregnancy. Discrete-time methods are used to estimate these models, and person-journals of exposure are the unit of analysis. We estimate logistic regression models predicting whether a pregnancy did or did not occur in each survey. Time-fixed control variables for sociodemographic characteristics, family background, prior sexual, contraceptive, and pregnancy experience, and journal number are included in each model. First, we estimate models with each individual attitude measure. Then we estimate a

model which includes only the attitude measures which were significant ($p < .1$) in the previous models. This same model estimation procedure is followed for measures of perceived norms, prototypes, expectations, and willingness. Descriptive statistics of the variables used in these analyses are provided in Table 1.

Results

Table 2 shows the relationships between general attitudes and respondents' hazard of experiencing a pregnancy. Models 1 through 4 include measures of attitudes toward sex. Model 1 shows higher pregnancy rates among respondents who believe that a woman should have sex with a partner she has been seeing for a while. Models 2 and 3 show lower pregnancy rates among respondents who believe they are not ready or would feel guilty after sex. Model 4 includes the index measure capturing attitudes toward sex. This model shows lower pregnancy rates among respondents with more negative attitudes toward sex.

Models 5-13 include measures of attitudes toward pregnancy. Model 6 shows the belief that a pregnancy now would be one of the worst things that could happen has a negative effect on the hazard of pregnancy. Model 8 shows higher pregnancy rates among respondents who believe they can handle the responsibilities of parenting. Model 9 shows the belief a pregnancy would force the respondent to grow up too fast has a negative effect on the hazard of pregnancy. Model 11 shows higher pregnancy rates among respondents who believe that a pregnancy would make their partner happy. Model 12 shows the belief one could not afford a child has a negative effect on the hazard of pregnancy. Model 13 includes the index measure capturing attitudes toward pregnancy. This model shows higher pregnancy rates among respondents with more positive

attitudes toward pregnancy. Model 14 shows both the attitudes toward sex and pregnancy indices affect the hazard of pregnancy independent of each other.[1]

Table 3 shows the relationships between measures of perceived norms and the hazard of pregnancy. Models 1 through 5 include measures of perceptions of the prevalence of sex, contraceptive use, and pregnancy among friends. Model 1 shows respondents who perceive higher proportions of their friends as having had sex have higher pregnancy rates. Model 2 shows respondents who perceive higher proportions of their friends as currently using birth control have lower pregnancy rates. Model 3 shows respondents who perceive higher proportions of their friends as having sex without birth control have higher pregnancy rates. Model 6 includes a measure of the perceived proportion of single mothers in the community. It has a significant and positive effect on the hazard of pregnancy. Models 7-16 include measures of perceptions of how parents and friends would react to various behaviors related to the same domains of sex, contraceptive use, and pregnancy. None of these measures are significant in these models. Model 17 shows the perception of higher proportions of friends as having had sex and currently using birth control effect the hazard of pregnancy independent of the other measures of perceived norms.

Table 4 shows the relationships between measures of prototypes of a person who engages in behaviors related to contraceptive use and pregnancy and the hazard of pregnancy. Model 3 shows higher pregnancy rates among respondents who believe women who keep a condom in their purse are "cool." Model 6 also shows higher pregnancy rates among respondents who believe women who have sex without birth control are "cool." In the combined model 10, the positive effects of these measures prove to be significant of each other.

[1] We also estimated models that included nine different measures of attitudes toward contraception and an averaged index of these measures. None of the measures had a significant effect on the hazard of pregnancy.

Table 5 shows the relationships between measures of expectations related to sex, contraceptive use and pregnancy and the hazard of pregnancy. Models 2 and 3 show higher pregnancy rates among respondents with higher expectations of sex without birth control in the next year and pregnancy in the next year. Model 4 demonstrates that these expectations exert independent effects on pregnancy rates.

Table 6 shows the relationships between two measures of willingness to engage in various risky behaviors that lead to pregnancy and the hazard of pregnancy. Neither measure is significant.

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Table 1. Descriptive Statistics of Measures Used in the Analyses

	N	Mean	Std. Dev.	Minimum	Maximum
Journal Measures					
Pregnancy	890	0.08		0	1
Baseline Control Measures					
Sociodemographic Characteristics					
Age					
18 years old	890	0.42		0	1
19 years old	890	0.50		0	1
20 years old	890	0.08		0	1
African American	890	0.33		0	1
School enrollment and type					
Not enrolled and did not graduate	890	0.08		0	1
Not enrolled and did graduate	890	0.21		0	1
High school	890	0.14		0	1
2 year college/vocational/technical/other	890	0.29		0	1
4 year college	890	0.29		0	1
Receiving public assistance	890	0.24		0	1
Religious importance	890	2.69	0.92	1	4
Living with romantic partner	890	0.14		0	1
Biological mother less than 20 years old at first birth	890	0.36		0	1
Family Structure					
Biological parents/biological and step parent	890	0.54		0	1
One biological parent only	890	0.23		0	1
Other	890	0.23		0	1
Mother's education less than high school graduate	890	0.08		0	1
Parent's income					
$14,999 or less	890	0.14		0	1
$15,000 or greater	890	0.67		0	1
Don't know/Refused	890	0.19		0	1
Sexual, Contraceptive, and Pregnancy Experiences					
Age at first sex					
14 years or less	890	0.16		0	1
15-16 years	890	0.35		0	1
17 years or greater/never had sex	890	0.50		0	1
Lifetime number of sexual partners	890	3.28	4.84	0	57
Ever had sex without birth control	890	0.46		0	1
Prior pregnancies					
0 prior pregnancies	890	0.79		0	1
1 prior pregnancy	890	0.14		0	1
2 or more prior pregnancies	890	0.07		0	1
Baseline Attitude Measures					
General Attitudes					
Sex					
Should have sex if seeing guy for a while	886	1.85	0.57	1	5
Not ready for sex	888	3.00	1.32	1	5
Feel guilty after sex	887	2.64	1.18	1	5
Attitudes toward sex index	890	3.26	0.79	1.67	5

Table 1 (continued). Descriptive Statistics of Measures Used in the Analyses

	N	Mean	Std. Dev.	Minimum	Maximum
Pregnancy					
Ok to be single mom	881	3.17	1.09	1	5
Pregnant now…					
… worst thing	890	3.99	1.19	1	5
…less lonely	889	2.03	0.85	1	5
…handle parenting	890	2.73	1.33	1	5
…grow up too fast	889	3.27	1.21	1	5
…quit school	888	2.33	1.04	1	5
…partner happy	870	2.45	1.16	1	5
…could not afford child	889	3.46	1.21	1	5
Attitudes toward pergnancy index	890	2.67	0.67	1	4.63
Perceived Norms					
Prevalence					
How many of your friends…					
…have had sex	888	4.15	1.13	1	5
…are using birth control	865	3.04	1.24	1	5
…have had sex without birth control	853	3.04	1.21	1	5
…have gotten pregnant	890	2.35	1.21	1	5
…are parents	890	2.25	1.20	1	5
How many women in community single parents	848	3.47	1.01	1	5
Approval					
How would your friends react if you…					
…had sex	886	2.71	1.44	0	5
…were using birth control	889	3.95	1.41	0	5
…had sex without birth control	889	1.45	1.44	0	5
…got pregnant	885	2.01	1.80	0	5
…had a baby	886	2.45	1.82	0	5
How would your parents react if you…					
…had sex	889	1.53	1.44	0	5
…were using birth control	888	3.66	1.68	0	5
…had sex without birth control	888	0.68	1.31	0	5
…got pregnant	889	1.18	1.63	0	5
…had a baby	887	1.75	1.89	0	5
Prototypes					
Women your age who keep a condom are…					
…intelligent	890	4.07	1.07	1	5
…careless	889	1.83	1.14	1	5
…cool	885	2.08	1.31	1	5
Women your age who have sex without birth control…					
…intelligent	890	1.29	0.63	1	5
…careless	890	3.90	1.31	1	5
…cool	889	1.19	0.61	1	5
Women your age who get pregnant are…					
…intelligent	879	1.94	0.90	1	5
…careless	884	3.21	1.32	1	5
…cool	883	1.29	0.65	1	5
Expectations					
Likelihood of sex next year	889	61.91	39.92	0	100
Likelihood of sex without birth control next year	890	17.75	30.03	0	100
Likelihood get pregnant next year	889	10.63	20.50	0	100
Willingness					
Refuse sex even if it makes partner angry	889	4.12	1.56	0	5
Have sex without birth control	887	1.07	1.39	0	5

Table 2. Logistic Regression Estimates of Effects of General Attitudes on Hazard of Pregnancy

	Model													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Attitudes toward sex														
Should have sex if seeing guy for a while	0.32†													
	(0.22)													
Not ready for sex		-0.21*												
		(0.11)												
Feel guilty after sex			-0.20†											
			(0.15)											
Attitudes toward sex index[a]				-.53*										-.38†
				(.23)										(.24)
Attitudes toward pregnancy														
Ok to be single mom					-0.08									
					(0.12)									
Pregnant now…														
… worst thing						-0.17*								
						(0.10)								
…less lonely							-0.09							
							(0.15)							
…handle parenting								0.36***						
								(0.11)						
…grow up too fast									-0.21*					
									(0.11)					
…quit school										-0.19				
										(0.16)				
…partner happy											0.21*			
											(0.10)			
…could not afford child												-0.40***		
												(0.12)		
Attitudes toward pregnancy index[b]													.62**	.52**
													(.21)	(.22)
-2 Log Likelihood	815.49	804.79	814.26	812.30	803.94	814.68	817.32	807.95	813.48	816.09	793.90	805.61	809.22	806.44
Df	23	23	23	23	23	23	23	23	23	23	23	23	23	24
Individuals	886	888	887	890	881	890	889	890	889	888	870	889	890	890
Observations	20,314	20,376	20,354	20,414	20,189	20,414	20,342	20,414	20,367	20,391	19,983	20,377	20,414	20,414

Notes: Slight differences in sample size are due to item-specific missing data (see Table 1). All models also include controls for sociodemographic characteristics, family background, prior sexual, contraceptive, and pregnancy experiences, and journal number.

[a] High score represents more negative attitudes toward sex

[b] High score represents more positive attitudes toward pregnancy

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

Table 3. Logistic Regression Estimates of Effects of Perceived Norms on Hazard of Pregnancy

	Model																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Prevalence																	
How many of your friends…																	
…have had sex	0.33*																0.27†
	(0.15)																(0.17)
…are using birth control		-0.14†															-0.17†
		(0.11)															(0.12)
…have had sex without birth control			0.17†														0.01
			(0.11)														(0.13)
…have gotten pregnant				0.13													
				(0.10)													
…are parents					0.05												
					(0.10)												
How many women in community single parents						0.22†											0.21
						(0.15)											(0.17)
Approval																	
How would your friends react if you…																	
…had sex							0.01										
							(0.08)										
…were using birth control								-0.05									
								(0.09)									
…had sex without birth control									0.01								
									(0.08)								
…got pregnant										0.01							
										(0.07)							
…had a baby											0.10						
											(0.08)						
How would your parents react if you…																	
…had sex												-0.05					
												(0.08)					
…were using birth control													0.16				
													(0.10)				
…had sex without birth control														-0.06			
														(0.09)			
…got pregnant															0.02		
															(0.07)		
…had a baby																0.03	
																(0.06)	
-2 Log Likelihood	812.37	785.72	772.95	816.39	817.71	776.39	816.47	817.61	817.88	816.91	814.78	816.77	812.81	815.45	817.09	815.68	726.97
Df	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	26
Individuals	888	865	853	890	890	848	886	889	889	885	886	889	888	888	889	887	808
Person journals	20,389	19,806	19,483	20,414	20,414	19,468	20,374	20,404	20,408	20,356	20,359	20,367	20,344	20,344	20,367	20,340	18,430

Notes: Slight differences in sample size are due to item-specific missing data (see Table 1). All models also include controls for sociodemographic characteristics, family background, prior sexual, contraceptive, and pregnancy experiences, and journal number. Coefficients are effects on log-odds. Standard errors in parentheses.

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

Table 4. Logistic Regression Estimates of Effects of Prototypes on Hazard of Pregnancy

	Model									
	1	2	3	4	5	6	7	8	9	10
Women your age who keep a condom are…										
…intelligent	0.11									
	(0.14)									
…careless		-0.02								
		(0.12)								
…cool			0.26**							0.24**
			(0.09)							(0.09)
Women your age who have sex without birth control…										
…intelligent				0.19						
				(0.18)						
…careless					0.05					
					(0.10)					
…cool						0.43**				0.39**
						(0.15)				(0.15)
Women your age who get pregnant are…										
…intelligent							0.10			
							(0.15)			
…careless								0.04		
								(0.10)		
…cool									0.18	
									(0.17)	
-2 Log Likelihood	817.39	817.88	809.41	816.89	817.74	811.48	805.36	816.32	815.98	804.07
Df	23	23	23	23	23	23	23	23	23	24
Individuals	890	889	885	890	890	889	879	884	883	885
Person journals	20,414	20,396	20,306	20,414	20,414	20,387	20,167	20,266	20,250	20,306

Notes: Slight differences in sample size are due to item-specific missing data (see Table 1). All models also include controls for sociodemographic characteristics, family background, prior sexual, contraceptive, and pregnancy experiences, and journal number. Coefficients are effects on log-odds. Standard errors in parentheses.

** $p < 0.01$ (one-tailed tests)

Table 5. Logistic Regression Estimates of Effects of Expectations on Hazard of Pregnancy

	Model			
	1	2	3	4
Likelihood of sex next year	0.01†			0.00
	(0.00)			(0.00)
Likelihood of sex without birth control next year		0.02***		0.01**
		(0.00)		(0.00)
Likelihood get pregnant next year			0.02***	0.01*
			(0.00)	(0.01)
-2 Log Likelihood	815.34	796.53	791.66	783.25
Df	23	23	23	25
Individuals	889	890	889	888
Person journals	20,385	20,414	20,411	20,382

Notes: Slight differences in sample size are due to item-specific missing data (see Table 1). All models also include controls for sociodemographic characteristics, family background, prior sexual, contraceptive, and pregnancy experiences, and journal number. Coefficients are effects on log-odds. Standard errors in parentheses.

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

Table 6. Logistic Regression Estimates of Effects of Willingness on Hazard of Pregnancy

	Models	
	1	2
Willingness to refuse to have sex with partner, even if it made him angry	0.04	
	(0.08)	
Willingness to have sex without any birth control		0.11
		(0.09)
-2 Log Likelihood	816.50	815.20
Df	23	23
Individuals	889	887
Person journals	20,391	20,384

Notes: Slight differences in sample size are due to item-specific missing data (see Table 1). All models also include controls for sociodemographic characteristics, family background, prior sexual, contraceptive, and pregnancy experiences, and journal number. Coefficients are effects on log-odds. Standard errors in parentheses.