

The Effect of Partners' Characteristics on Teenage Pregnancy and Its Resolution

By Madeline Zavodny

Context: Although the determinants of whether a teenage woman has a nonmarital pregnancy and how such a pregnancy is resolved have been widely investigated, little is known about the effect of her partner's characteristics or the joint influence of the two partners' characteristics on nonmarital teenage pregnancy.

Methods: Data from the 1995 National Survey of Family Growth are used to examine whether the characteristics of teenage women and their partners affect the likelihood of a nonmarital pregnancy and how the pregnancy is resolved. The data are corrected for underreporting of abortions.

Results: More than 17% of teenage women are estimated to have become pregnant during their first nonmarital teenage sexual relationship. About 44% of these pregnancies result in a nonmarital birth and about 18% in a marital birth, while 37% end in an abortion. The likelihood of nonmarital pregnancy declines as age at first intercourse rises, but age does not affect how such a pregnancy is resolved. Women who are older than their first partner are more likely to become pregnant than those who are the same age, and their pregnancies are less likely to end in abortion than in a marital birth. Women who are younger than their first partner are no more likely to become pregnant than other women after the effects of other characteristics are taken into account. The male partner's education is negatively associated with the likelihood of nonmarital pregnancy but is positively associated with the likelihood of abortion if a pregnancy occurs. Differences between partners in race or ethnicity do not affect the likelihood of a nonmarital pregnancy but do increase the likelihood that such a pregnancy will end in abortion or a nonmarital birth rather than in a marital birth.

Conclusions: The characteristics of teenage women and their partners appear to play a role in nonmarital teenage pregnancy and its outcome. However, the estimated relationships between one partner's characteristics and the probability of a nonmarital pregnancy and its resolution are generally little affected by whether the other partner's characteristics are also taken into account.

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Teenage pregnancy and childbearing have received widespread attention in recent years. Although the birthrate among women aged 15–19 fell during the period 1991–1998, after rising between 1986 and 1991, the fraction of such births that were to unmarried women continued to increase, reaching almost 79% in 1998.¹ In addition, the ratio of abortions to births among women aged 15–19 declined between the early 1980s and the mid-1990s, suggesting that the fraction of nonmarital pregnancies that resulted in nonmarital births also rose.² Studying teenage childbearing, particularly nonmarital births, is important because of the potential negative effects on both mothers and children.³ Concerns about such effects have moti-

vated research on the underlying determinants of teenage women's sexual activity, contraceptive use and fertility. Studies have investigated, for example, the impact of young women's family background, their receipt of welfare benefits and the level of those benefits, and abortion provider availability on the likelihood of nonmarital teenage pregnancy and on the outcome of such pregnancies.⁴

Researchers have also examined men's role in nonmarital teenage pregnancy and its resolution. Using data from surveys of adolescent males, studies have explored the effects of young men's family background, education and other characteristics on whether they become a father or impregnate a partner.⁵ However, adoles-

cent males do not cause all—or even most—teenage pregnancies, and little is known about older sexual partners of teenage women.⁶ In addition, some men may not know that their partner became pregnant, particularly if the pregnancy was terminated or the relationship ended. Such data limitations have prevented researchers from using information from surveys of men to examine the role of men's characteristics in whether a pregnancy ends in abortion instead of birth.

Previous research on the joint effect of the male and female partners' background characteristics on the probability that a teenage woman has a nonmarital pregnancy and on how the pregnancy is resolved was limited to examining age and educational differences. Age differences appear to influence pregnancy rates and pregnancy outcome.⁷ In addition, differences in partners' educational attainment appear to affect the likelihood that a nonmarital pregnancy leads to marriage.⁸ Age differences and both partners' educational attainment also appear to affect contraceptive use, further suggesting the importance of examining the role of both women's and men's characteristics in nonmarital pregnancy.⁹ Studies have been limited in their ability to examine the role of other characteristics in nonmarital teenage pregnancy because most surveys include questions about the background of spouses, and occasionally cohabiting partners, but not about other sexual partners. Assessing the role of both partners in teenage pregnancy may provide information needed to design policies that lower the

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number of teenage pregnancies and the number of nonmarital births.

This article examines the role of the characteristics of teenage women and their first voluntary sexual partner in nonmarital pregnancy and its resolution. First, data from a nationally representative survey are used to examine the determinants of whether a teenage woman becomes pregnant during her first voluntary sexual relationship. The data are corrected for underreporting of pregnancies that end in abortion, a common problem in individual-level surveys. The effect of women's characteristics and those of their partner on pregnancy outcomes is then assessed.

Data and Methods

Data

The 1995 National Survey of Family Growth (NSFG), an individual-level survey of 10,847 U.S. women aged 15–44, focuses on women's fertility and includes a detailed pregnancy history. The NSFG includes questions about the outcome of each pregnancy a woman has had and about marital status at the time of each conception and birth. The survey also asks about women's own characteristics and about the background of their current and former nonmarital sexual partners.

The NSFG is unique in the number of questions it asks women about their sexual partners and in the types of partners about whom it asks. The 1995 survey asked about the background of women's first voluntary sexual partner, up to 20 new partners since January 1991, and current and former husbands and cohabiting partners. Women were asked about these partners' age, education, race, Hispanic ethnicity and religious denomination, as well as the importance the partners placed on religion. The survey also asked the month and year when sexual activity with each of these partners began and ended.

This analysis examines whether women's first voluntary sexual relationship resulted in a nonmarital teenage pregnancy and, if so, how the pregnancy was resolved. Only women's first voluntary sexual relationship is investigated because all women were asked questions about that relationship; the survey did not ask about other teenage sexual relationships unless a woman had married or cohabited with the partner or the woman was a teenager in the four years prior to the survey. Limiting the analysis to the first partner may still encompass a substantial proportion of nonmarital teenage pregnancies because many teenage pregnancies occur soon after first intercourse. About one-fifth of all first non-

marital teenage pregnancies occur within one month of women's first intercourse, and one-half occur within the first six months.¹⁰

The sample used here is restricted to women who were not married and were between the ages of 15 and 19 when they first had voluntary sex. (About 8% of the sample reported having had involuntary sex prior to their first voluntary intercourse.) Women who had not had sex before they were 20 and those who were married when they first had intercourse are not included. This narrows the sample to 5,823 women. Because sexual behavior may have changed over time and because of the necessity of comparing the data to abortion totals published elsewhere, as discussed below, the sample is further restricted to women who first had sex in 1982 or later and who reached their 15th birthday after 1981 (2,003 women); women who reached age 15 before 1982 are not included because they could have become pregnant before the beginning of the sample period. The sample is also limited to women who were at least 20 years old at the time of the interview (1,584 women). Females who were 19 or younger at the time of the survey interview are not included here because some of these teenagers are still at risk of having a nonmarital teenage pregnancy with their first partner. The age at the time of interview of the women in the sample ranges from 20 to 28.

The NSFG includes questions about the background of sexual partners but not about the background of those responsible for a pregnancy. The survey asks only the age of the impregnating partner at the time a woman conceived. The determination of whether the first partner was responsible for a woman's pregnancy is based on the reported date of conception and the dates of the woman's first and last sexual encounters with the first partner. If conception occurred during the interval when the couple was sexually active, the first partner is generally assumed to be responsible for the pregnancy. An observation is dropped from the sample if the woman reported becoming pregnant during an interval when she had sex with another partner as well as with her first partner.* Women reporting a pregnancy who said that the impregnating partner was more than two years older or younger than their first partner is estimated to have been at the time of conception are also dropped from the sample.[†] These restrictions reduce the sample to 1,514 observations.

About 21% of women did not report at least one of the characteristics of their first

voluntary sexual partner. Women who became pregnant were considerably more likely than women who did not become pregnant to report all of the characteristics of their first partner (85% vs. 78%). Women who did not report their first partner's characteristics are retained in the sample because dropping these observations would result in an underestimate of the likelihood of nonmarital teenage pregnancy. As discussed below, missing characteristics of the partner are imputed based on the characteristics of the woman.[‡] Dropping these observations had little effect on the results but increased the proportion of women in the sample who became pregnant and the proportion who had a marital birth.

The final sample includes 1,514 women who had complete data on their own background as well as on their first partner's background.[§] All races and ethnicities are combined into one sample, and race and Hispanic ethnicity are accounted for in the empirical analysis. The small size of the "other race, non-Hispanic" group (37 observations) should be kept in mind when interpreting the estimated race and ethnicity coefficients.

Abortion Underreporting

It is well-known that women tend to underreport abortions in individual-level surveys.¹¹ In the 1995 NSFG, women reported about 64% of the number of abortions that The Alan Guttmacher Institute (AGI) estimates occurred during the period 1976–1994.¹² Underreporting was

*The NSFG may not have information on the dates of all sexual relationships, so some women may have had multiple partners at the time they became pregnant but still may be included in the sample. Women were not asked about partners with whom they had not had sex in the last five years, with the exception of their first former husband and their first partner, so the dates of such sexual relationships are unknown. Forty-seven observations (3%) were dropped because of multiple partners.

†Women were asked the age of their first partner at the time the couple first had sex. The man's approximate age at the time of conception is calculated as the age at first intercourse plus one-12th of the difference in months between conception and first intercourse. Twenty-three observations (2%) were dropped because of age discrepancies.

‡Dichotomous variables that indicate whether a partner's characteristics are missing are not included because they are highly correlated with outcomes. For example, the only women who did not report their partner's age were women who did not become pregnant, and all women who became pregnant and had a marital birth reported their partner's educational attainment.

§Mother's educational attainment and work history are imputed as weighted sample means for 10 women missing these variables; omitting these observations does not affect the results.

Table 1. Percentage of teenage women who became pregnant in their first voluntary nonmarital sexual relationship, by outcome, according to adjustment for abortion underreporting, 1995 National Survey of Family Growth

Pregnancy outcome	Unadjusted	Adjusted
% pregnant	14.7	17.5
Stillbirths and miscarriages	1.8	1.8
Abortions	3.0	5.8
Live births	9.9	9.9
Marital	2.9	2.9
Nonmarital	7.0	7.0

Note: Unadjusted percentages are weighted using the sample weights, and adjusted percentages are weighted using the sample weights adjusted for underreporting of abortions. The sample includes 1,514 women aged 15–19 at the time of nonmarital first voluntary intercourse in 1982 or later.

most prevalent among women aged 25–29 or never-married at the time of the abortion, women with incomes below 200% of the poverty level, Catholics and blacks. However, the overall reporting rate is likely to be higher in the 1995 NSFG than in many other surveys because the 1995 NSFG included a self-administered survey on abortions and other sensitive topics and because respondents were paid \$20 for completing the survey.

Underreporting of abortions creates several problems for studies that analyze pregnancy probabilities and outcomes. First, pregnancies that end in abortions also tend not to be reported, leading to underestimates of the likelihood of pregnancy. Underreporting of abortions also

*Abortion numbers by age and race for each year were calculated by multiplying annual abortion totals from AGI (which are generally believed to be more complete than totals from the CDC) by the fraction of abortions performed among women aged 15–19 and then by the racial distribution of abortions within the 15–19 age-group, using data published by the CDC. The CDC publishes counts of abortions within age and racial groups for only a subset of states, not for all states, necessitating that totals within demographic groups be inferred based on known distributions. The CDC data on the distribution of abortions by age and race are first available for 1982 and are published annually in *Morbidity and Mortality Weekly Reports*. The AGI data are from Henshaw SK and Van Vort J, *Abortion Factbook*, 1992 ed., New York: AGI, 1992; Henshaw SK and Van Vort J, Abortion services in the United States, 1991 and 1992, *Family Planning Perspectives*, 1994, 26(3):100–106 & 112; and Henshaw SK, Abortion incidence and services in the United States, 1995–1996, *Family Planning Perspectives*, 1998, 30(6):263–270 & 287.

†The total number of women aged 15–19 who were sexually active and did not report becoming pregnant is calculated using the sample weights. The fraction who became pregnant is then the number of “missing” abortions divided by the total number of these women.

‡The average during 1982–1994 is 609 abortions per 1,000 live births to women aged 15–19; see the CDC Abortion Surveillance reports published in *Morbidity and Mortality Weekly Reports*.

leads to an overestimate of the fraction of pregnancies that lead to births. In addition, underreporting of abortions creates statistical problems for models that examine the relationship between characteristics and pregnancy probabilities and outcomes if underreporting is not random but is instead systematically correlated with those attributes. Using data uncorrected for underreporting could lead to biased estimates and flawed inferences.

This article corrects for underreporting of abortions by comparing the number of abortions reported in the NSFG to women aged 15–19 during 1982–1994 with other counts of abortions among teenagers during that period. For each year, the number of abortions among women aged 15–19 reported in the NSFG is calculated using the sample weights. These numbers are then compared to total abortion numbers based on data from AGI and the Centers for Disease Control and Prevention (CDC).* The difference between the two numbers for each year gives the number of abortions not reported in the NSFG. The fraction of sexually active women aged 15–19 who became pregnant and had an abortion but did not report it in the NSFG is then calculated.† The analysis is done separately for whites (including Hispanics) and nonwhites each year because both abortion underreporting and actual abortion rates are higher among nonwhites than among whites.

According to this method, about 3% of sexually active white women aged 15–19 and 5% of comparable nonwhites became pregnant and had an abortion during the period 1982–1994 but did not report it in the NSFG. In comparison, about 3% of whites and 4% of nonwhites in the sample used here reported having had an abortion during their first teenage sexual relationship. This suggests that about one-half of teenage abortions are not reported and that underreporting is more common among nonwhites, in line with previous estimates.¹³ After corrections are made for underreporting of abortions, the ratio of abortions to live births among women aged 15–19 in the sample is about six to 10, also in line with other reports of the number of abortions relative to live births during the period 1982–1994.‡

The data used here are corrected for underreporting by attributing the estimated probability of pregnancy and abortion to women in the sample who do not report a pregnancy. For each woman who does not report a pregnancy, two observations are created. The first observation is coded as a pregnancy and an abortion and given

a weight equal to the sample weight of the observation multiplied by the probability of an abortion, which is race- and year-specific. The second observation is coded as a nonpregnancy and is given a weight equal to the sample weight multiplied by one minus the probability of an abortion. The sensitivity of the results to correction for underreporting of pregnancies and abortions is discussed below.

Descriptive Statistics

Table 1 reports the distribution of observations by pregnancy outcome in the sample before and after correcting for underreporting of abortions. More than 17% of women in the sample became pregnant during their first teenage sexual relationship (15% before correcting for underreporting). These fractions are lower than the proportion of all women who have a nonmarital teenage pregnancy because this analysis examines only women's first voluntary sexual relationship; another study finds that about 24% of white women and 48% of black women reported having had a nonmarital teenage pregnancy.¹⁴ About 10% of nonmarital teenage pregnancies in the sample are reported to have ended in a fetal loss (miscarriage or stillbirth). These observations are excluded from the analysis of whether a pregnancy ends in an abortion, a marital birth or a nonmarital birth, but are included in the analysis of whether a teenager becomes pregnant.

The uncorrected data suggest that about 23% of pregnancies result in an abortion, compared with almost 37% in the corrected data (not shown). Again, about one-half of abortions among women aged 15–19 during 1982–1994 appear to go unreported in the NSFG. Using the corrected data, 44% of teenage nonmarital pregnancies lead to a nonmarital birth, and 18% result in a marital birth. About 7% of women in the sample have a nonmarital birth, and more than 70% of teenagers whose nonmarital pregnancy results in a birth are not married at the time of the birth. About 29% of teenagers whose nonmarital pregnancy results in a birth (almost 3% of the total sample) marry before the birth.

Measures

The empirical analysis below examines whether the characteristics of teenage women and their partners are related to the probability that a nonmarital pregnancy occurs and to the outcome of the pregnancy. Whether a sexually active unmarried teenage woman becomes pregnant and how she resolves such a pregnancy are likely to

depend on the costs and benefits to her of a pregnancy and of the possible outcomes. Similarly, if male partners affect whether a nonmarital teenage pregnancy occurs and how it is resolved, their economic resources and opportunities are expected to play a role. Variables that reflect the costs and benefits of a teenage nonmarital pregnancy and birth include both partners' age, race, ethnicity and religious background; the woman's family background; and the man's educational attainment. Measures of these factors are included in a model of whether a teenager becomes pregnant during her first sexual relationship and in a model of whether such a pregnancy results in an abortion, a marital birth or a nonmarital birth.

Older individuals may be more likely to recognize the costs of a nonmarital teenage pregnancy, but they may also have more resources for supporting a child and a spouse. One study of young women suggests that age does not significantly affect the likelihood of nonmarital pregnancy.¹⁵ However, age differences between teenage women and their partners appear to affect pregnancy and abortion rates.¹⁶ Previous research also indicates that, given a nonmarital pregnancy, the likelihood of a nonmarital birth instead of a marital birth decreases as a woman's age rises.¹⁷

The models estimated here include measures of women's age, their partner's age and the difference between their ages. A linear variable that measures each partner's age when they first had intercourse together is included in the models of nonmarital teenage pregnancy and pregnancy resolution. The male partner's age was imputed for nine observations, or 0.6% of the sample.* A dichotomous variable that indicates whether a woman was older than her first partner is included in models that examine both partners' characteristics. Further dichotomous variables measuring whether a woman was 2–7 years younger and eight or more years younger than her first partner are also included in the models; these categories were chosen because the data suggested a difference in pregnancy rates and outcomes at those break points. The great majority of women are the same age as or younger than their first sexual partner (Table 2).

Race and ethnicity may reflect the economic opportunities available to teenage women. Vital statistics data indicate that pregnancy rates are lower among non-Hispanic white teenage women than among blacks or Hispanics, and that the fraction of pregnancies that end in abortion is lower

among Hispanic female teenagers than among white or black teenagers.¹⁸ Previous research indicates that, given a nonmarital pregnancy, black and Hispanic young women are more likely than their white counterparts to have a nonmarital birth.¹⁹ The empirical analysis below includes indicator variables for whether women are non-Hispanic black, Hispanic or non-Hispanic other, with non-Hispanic white as the omitted group.

Men's race and ethnicity may also have an indirect influence on nonmarital teenage pregnancy and its outcome. After the effects of other characteristics were accounted for, one study found that black teenage males appear more likely to impregnate a partner and to father a child than are other teenage males.²⁰ Another earlier study concluded that Hispanic and black teenage fathers are less likely than whites to marry the mother of the child.²¹ However, other previous findings indicate that race is not significantly associated with the likelihood that an adolescent male impregnates a partner.²²

In the sample used here, almost 89% of women are of the same race and ethnicity as their first partner (Table 2), although a sizable minority of Hispanic women have a non-Hispanic partner. Part of the empirical analysis includes indicator variables for whether the male partner is non-Hispanic black, Hispanic or of another race or ethnicity, with white non-Hispanics as the omitted group.[†] Indicator variables for both women's and men's race and ethnicity cannot be included in the same regression because of collinearity problems, so some of the analysis below includes a dichotomous variable that indicates whether a woman is of a different race or ethnicity than her first sexual partner instead of variables that control for the man's race and ethnicity.

Table 2. Percentage distributions and means (and standard deviations) of characteristics of teenage women and their first sexual partner, according to sample

Characteristic	Full sample	Women with pregnancy
Woman's characteristics		
Mean age at first intercourse	16.7 (1.2)	16.5 (1.2)
% distribution by race and ethnicity		
Black, non-Hispanic	13.6	21.9
Hispanic	10.4	22.0
Other race, non-Hispanic	3.3	5.0
Non-Hispanic white (omitted category)	72.7	51.1
% distribution by religious affiliation		
Catholic	31.6	36.3
Baptist	23.5	26.9
Other denomination	34.6	25.9
None (omitted category)	10.2	11.0
% distribution by frequency of church attendance		
Very frequent	16.9	18.8
Frequent	50.6	50.5
Infrequent or never (omitted category)	32.4	30.6
Mother worked (%)	69.8	65.0
Mother's mean yrs. of education	12.3 (3.1)	11.3 (3.8)
Intact two-parent family (%)	59.1	47.9
Partner's characteristics		
Mean age	19.0 (3.2)	19.0 (3.2)
% distribution by race and ethnicity		
Non-Hispanic black	15.3	23.4
Hispanic	10.1	23.7
Other race, non-Hispanic	2.7	3.7
Non-Hispanic white (omitted category)	71.8	49.2
% distribution by religious affiliation		
Catholic	34.4	35.8
Protestant	44.9	45.9
Other or none (omitted category)	20.6	18.3
% distribution by importance of religion		
Very important	47.1	50.6
Not very important (omitted category)	52.9	49.4
Mean yrs. of education at first intercourse	11.5 (1.6)	11.2 (1.7)
Joint characteristics		
Different race/ethnicity (%)	11.5	11.6
% distribution by age difference		
Woman older than partner	6.1	8.0
Woman ≥8 yrs. younger than partner	5.9	5.9
Woman 2–7 yrs. younger than partner	47.1	50.8
About same age (omitted category)	40.9	35.3
Same religion (%)	58.2	58.2

Note: Observations are weighted using the sample weights adjusted for underreporting of abortions.

Women's religious affiliation and church attendance may play a role in nonmarital teenage pregnancy and its outcome, although previous findings are mixed.²³ One study of teenage males finds that being raised Catholic is positively associated with the probability that a nonmarital pregnancy will result in marriage.²⁴ The NSFG includes the religious affiliation of women and their first partner, frequency of women's church attendance at age 14, and women's reports of the importance of religion to their first partner. The analysis here includes three

*Men's ages were imputed using linear prediction. The variables were the woman's age at first intercourse and a constant.

†If the man's race and ethnicity were not reported (26 observations, or 2%), they were imputed to be the same as the race and ethnicity of the woman.

Table 3. Odds ratios from logistic regression models of the effects of woman's, partner's and joint characteristics on nonmarital pregnancy among teenage women in their first voluntary sexual relationship

Characteristic	Woman-only	Partner-only	Joint
Woman's characteristics			
Age at first intercourse	0.82**	na	0.76**
Black, non-Hispanic	2.30**	na	2.41**
Hispanic	3.20**	na	3.33**
Other race, non-Hispanic	2.13*	na	2.33*
Catholic	0.84	na	0.84
Baptist	0.73	na	0.68
Other denomination	0.66	na	0.60
Very frequent church attendance	1.23	na	1.21
Frequent church attendance	1.15	na	1.18
Mother worked	0.74*	na	0.71*
Mother's education	0.93**	na	0.93**
Intact two-parent family	0.62**	na	0.63**
Partner's characteristics			
Age	na	1.02	1.11*
Non-Hispanic black	na	2.37**	na
Hispanic	na	4.73**	na
Other race, non-Hispanic	na	2.33	na
Catholic	na	0.94	1.50
Protestant	na	1.10	1.83*
Very religious	na	1.14	1.19
Education at first intercourse	na	0.87**	0.91*
Joint characteristics			
Different race or ethnicity	na	na	0.86
Woman older than partner	na	na	2.15*
Woman ≥8 yrs. younger than partner	na	na	0.35
Woman 2–7 yrs. younger than partner	na	na	0.93
Same religion	na	na	0.65*
Log-likelihood	-1186.18	-1201.90	-1166.33

*p<.05. **p<.01. Note: na=not applicable.

indicator variables for the denomination in which a woman was raised (Catholic, Baptist and other, with none as the omitted group) and two indicator variables of the frequency of young women's church attendance (very frequently and frequently, with infrequently as the omitted group). Two indicator variables for the male partner's religion (Catholic and Protestant, with other as the omitted group) and an indicator variable for

*The NSFG has fewer classifications for religious affiliation of partners than for those of survey respondents. If the partner's religious affiliation was not reported (270 observations, or 18%), it was imputed as the woman's religion. Observations missing the importance of religion to the partner (152 observations, or 10%) had religion imputed as very important if the woman attended church very frequently at age 14. These imputation procedures correctly predicted the partner's religious affiliation and importance of religion for more than 60% of observations with known values. The NSFG does not include a measure of the importance of religion to the woman analogous to the measure for her first partner.

†Using two variables that measured whether both partners were Catholic and whether both partners were Protestant indicated the two variables had similar effects, so they are combined in one variable.

‡Education was imputed using linear prediction, where the variables were age at first intercourse, race, ethnicity and a constant.

whether the partner was very religious are also included.* In models that examine both partners' characteristics, a dichotomous variable indicating whether the man and woman were of the same religion (both Catholic or both Protestant) is included.†

The models also include variables that capture women's family background. Earlier studies find that the employment status and educational attainment of young women's mothers affect the probability of a nonmarital pregnancy and its resolution.²⁵ Previous research also suggests that family structure affects the likelihood that a young woman will have a nonmarital pregnancy and what the pregnancy outcome will be.²⁶ Variables indicating whether a young woman's mother worked during most of her childhood and whether she lived in an intact two-parent family until age 15 are included in the models. The majority of women in the sample grew up in an intact two-parent family and had a mother who worked during most of their childhood (Table 2). A linear variable that measures the educational attainment of a teenage woman's mother is also included in the models.

The male partner's educational attainment is likely to influence the costs and benefits of a nonmarital pregnancy and birth. Previous research indicates that more-educated teenage males are more likely than their less-educated peers to marry their partner within 12 months of conception.²⁷ A linear variable that measures the male partner's educational attainment at the time the couple first had intercourse is included in the regressions below. Men's education was imputed for 43 observations, or less than 3% of the sample.‡

The models estimated here do not examine the effect of relationship duration on the likelihood of pregnancy and its resolution. Women's exposure to the possibility of becoming pregnant increases with relationship duration, and the likelihood of marriage may rise with the duration of the relationship at conception. Relationship du-

ration is not included in the models because it is likely to be endogenous; a relationship that might otherwise continue may end if the woman becomes pregnant.

Methods

A logistic regression model is used to examine the determinants of the likelihood that a teenage woman will become pregnant during her first nonmarital sexual relationship. Regressions are estimated for three sets of variables: women's characteristics only, men's characteristics only and both partners' characteristics. Further regressions are estimated to determine whether the influence of one partner's characteristics on the likelihood of a nonmarital teenage pregnancy changes when the effects of the other partner's characteristics are taken into account. Observations are weighted using the NSFG weights to make the sample representative of the U.S. female population, and the data are corrected for underreporting of aborted pregnancies. Results are presented in the form of odds ratios, which give the estimated change in the likelihood of a nonmarital teenage pregnancy for a one-unit change in an independent variable.

A multinomial logit model is used to investigate the role of both partners' characteristics in whether a nonmarital teenage pregnancy leads to an abortion, a marital birth or a nonmarital birth. In the regressions estimated here, marital births are the base category, so the models estimate the likelihood that an abortion or a nonmarital birth will occur relative to the likelihood that a marital birth will occur. Odds ratios that give the change in the relative likelihood of an outcome occurring for a one-unit change in the independent variable are presented, and observations are weighted using the NSFG weights. The data are again corrected for underreporting of abortions.

All of the regressions are estimated using the econometric package Stata, with the standard errors clustered on sampling strata and panel (sampling units used in selecting the survey sample) to correct for the complex sample design used by the NSFG. The results were unchanged when a linear time trend or year indicator variables were included to control for changes in fertility behavior over time; such variables are not included in the results reported here.

Results

Pregnancy Model

Several characteristics of each partner appear to affect the likelihood that a teenage woman will become pregnant during her

first nonmarital sexual relationship. The likelihood of pregnancy falls as the woman's age at first intercourse rises (Table 3), regardless of whether her partner's characteristics are included in the analysis. The male partner's age does not have a significant effect when only the effect of men's characteristics is examined; when the effect of the woman's age is controlled for, however, the likelihood of pregnancy increases with the man's age. Women who are younger than their first partner are not significantly more likely to become pregnant than women who are about the same age as their first partner; these results are unchanged when the linear variable measuring the man's age is omitted. Women who are older than their first partner are significantly more likely to become pregnant than women who are about the same age as their first partner (odds ratio, 2.2).

The probability of a nonmarital teenage pregnancy varies substantially by race and ethnicity. The results of the woman-only model and the joint model show that the odds of becoming pregnant are 2–3 times as high among teenage women who are black, Hispanic or of "other" races as they are among white teenage women. Moreover, according to the partner-only model, black and Hispanic men are significantly more likely than white men to impregnate their teenage partner (odds ratios of 2.4 and 4.7, respectively). When both partners' characteristics are included in the regression, whether the partners are of different races or ethnicities does not significantly affect the likelihood of pregnancy.

Women's religious background does not appear to affect the likelihood of a nonmarital teenage pregnancy. Men's religious background does not significantly influence the likelihood of a nonmarital teenage pregnancy when women's characteristics are not included in the model. When both partners' characteristics are included, however, the likelihood of pregnancy is higher among women who reported that their first partner was Protestant than it is among other women. The likelihood of a pregnancy is significantly lower when both partners have the same religious background (odds ratio, 0.7). These results do not change when controls are included for whether the man's religious affiliation was reported.

The likelihood that young women will become pregnant declines as the educational attainment of their mothers rises. Moreover, women who lived with both of their parents until at least age 15 are less

Table 4. Odds ratios from multinomial logit regression models of the effects of woman's, partner's and joint characteristics on whether nonmarital teenage pregnancy ends in abortion or nonmarital birth instead of marital birth

Characteristic	Woman-only		Partner-only		Joint	
	Abortion	Nonmarital birth	Abortion	Nonmarital birth	Abortion	Nonmarital birth
Woman's characteristics						
Age at first intercourse	1.34	1.28	na	na	1.22	1.22
Black, non-Hispanic	10.98**	23.53**	na	na	13.26**	34.25**
Hispanic	0.38*	0.58	na	na	0.14**	0.27
Other race, non-Hispanic	0.29	0.36	na	na	0.37	0.43
Catholic	2.13	0.92	na	na	1.17	0.55
Baptist	0.62	0.41	na	na	0.60	0.33
Other denomination	1.35	0.43	na	na	1.15	0.33
Very frequent church attendance	0.39	0.95	na	na	0.35	1.00
Frequent church attendance	0.49	0.66	na	na	0.45	0.60
Mother worked	0.92	0.53	na	na	0.90	0.56
Mother's education	1.14*	1.02	na	na	1.14*	1.02
Intact two-parent family	0.79	0.70	na	na	0.76	0.77
Partner's characteristics						
Age	na	na	0.88*	0.95	0.99	1.13
Non-Hispanic black	na	na	6.45**	22.43**	na	na
Hispanic	na	na	0.27*	1.68*	na	na
Other race, non-Hispanic	na	na	0.14*	1.40	na	na
Catholic	na	na	1.39	0.63	1.40	0.78
Protestant	na	na	0.29*	0.35	0.16*	0.19*
Very religious	na	na	0.54	0.50	0.59	0.62
Education at first intercourse	na	na	1.47**	0.98	1.31	0.89
Joint characteristics						
Different race or ethnicity	na	na	na	na	16.18*	34.40**
Woman older than partner	na	na	na	na	0.28**	0.29
Woman ≥8 yrs. younger than partner	na	na	na	na	0.13	0.07
Woman 2–7 yrs. younger than partner	na	na	na	na	0.11*	0.46
Same religion	na	na	na	na	2.04	2.58
Log-likelihood	-1360.35	-1360.35	-1334.25	-1334.25	-1208.96	-1208.96

*p≤.05. **p≤.01. Note: na=not applicable.

likely to become pregnant during their first sexual relationship than are young women raised in other family structures (odds ratio, 0.6). Young women whose mothers work outside the home are also significantly less likely to become pregnant than are other young women (0.7). Men's educational attainment is negatively associated with the likelihood that a pregnancy occurs.*

The results indicate that not controlling for one partner's characteristics generally does not significantly change the estimated effect of the other partner's characteristics on the likelihood of a nonmarital teenage pregnancy. The results from the woman-only and partner-only models are similar to those in the joint model. The only notable difference is that whether the man is Protestant becomes significant when both partners' attributes are included in the model, and whether the partners have the same religious affiliation appears to matter. This finding suggests that previous research that could not examine the joint effect of partners' characteristics has generally not reached erroneous conclusions.

Pregnancy Resolution Model

Several of the partners' characteristics also appear to influence the outcome of a nonmarital teenage pregnancy. The likelihood that a nonmarital teenage pregnancy will lead to an abortion instead of a marital birth decreases as the man's age rises but is not significantly related to the woman's age (Table 4). Given a nonmarital pregnancy that leads to birth, neither partner's age has a significant effect on whether they marry. The results of the joint model indicate that the odds of an abortion relative to a marital birth are significantly lower if the woman is older than the man (0.3) or if the woman is 2–7 years younger than the man (0.1) than if they are about the same age. These results remain unchanged when the linear variable measuring the man's age is omitted.

Race and ethnicity appear to play a large role in the resolution of nonmarital teenage pregnancies as well as in their oc-

*In results not shown here, controlling for whether the male partner was 18 or older and had already finished high school did not have significant effects in any of the models.

currence. Compared with their white counterparts, unmarried black teenage women who become pregnant are significantly more likely to have an abortion (odds ratio of 11.0) or to have a nonmarital birth (23.5) than to have a marital birth. The partner-only model similarly indicates that when the unmarried teenage partner of a black man becomes pregnant, she is significantly more likely than the teenage partner of a white man to have either an abortion (odds ratio of 6.5) or a nonmarital birth (22.4) than to have a marital birth. Compared with their white counterparts, Hispanic women and the partners of Hispanic men (64% of whom are also Hispanic) are less likely to have an abortion (odds ratios of 0.4 and 0.3, respectively) than a marital birth. The odds of having a nonmarital birth are significantly higher for partners of Hispanic men than for partners of white men (1.7).

Racial and ethnic differences between partners have an independent effect on the outcome of a teenage pregnancy when the woman's race and ethnicity are taken into account: Compared with the odds of a marital birth, the odds of an abortion (16.2) or a nonmarital birth (34.4) are significantly higher when the couples are of different races or ethnicities than when they have the same racial and ethnic background.

In some cases, men's religious affiliation appears to influence how a nonmarital teenage pregnancy is resolved, whereas women's religious background has no effect. Having a Protestant male partner is negatively associated with the likelihood that a nonmarital teenage pregnancy will lead to an abortion (0.3) rather than to a marital birth, relative to having a male partner with no or "other" religious background. These results do not change when controls are included for whether the man's religious affiliation was reported.

The male partner's education may influence whether a pregnancy is aborted, with the relative likelihood of an abortion increasing with the man's education (odds ratio of 1.5) when only the male partner's characteristics are included in the model. The educational attainment of a woman's mother also appears to influence the outcome of a nonmarital teenage pregnancy, with the mother's education positively associated with the likelihood of an abortion (1.1) instead of a marital birth.

A comparison of the three models reported in Table 4 indicates that the estimated coefficients for one partner's characteristics are generally little affected when the other partner's characteristics are accounted for. This pattern suggests

that the partners' characteristics exert an independent influence on how a nonmarital pregnancy is resolved. However, age differences and racial or ethnic differences between partners appear to affect the outcome of a nonmarital pregnancy.

Robustness to Abortion Correction

The results discussed above used data corrected for underreporting of abortions in the NSFG. The correction is based on the year a woman first became sexually active and on her race. In results not shown here, the results of both the pregnancy probability model and the pregnancy resolution model proved to be generally similar when the uncorrected data were used. The only notable difference was that in the pregnancy resolution model, the estimated coefficients on the Hispanic indicator variables for both partners were no longer statistically significant when the uncorrected NSFG data were used.

Because of concerns about the quality of abortion reporting in the NSFG, it might be desirable to limit inferences to the effect of partners' characteristics on the likelihood that a woman has a nonmarital pregnancy that leads to a birth and on whether the birth is marital or nonmarital. In a logit model for nonmarital teenage pregnancies leading to births, the results are similar to those shown in Table 3 for the logit model for all pregnancies, and are therefore not shown here. The only qualitative difference is that the estimated coefficients for nonmarital pregnancies among teenage women with a Hispanic partner or with a nonwhite, non-Hispanic partner are twice the magnitude of those in column 2 of Table 3 and are significant at the 1% level. This finding implies that teenage nonmarital sexual partners of white, non-Hispanic men are more likely to have an abortion rather than a birth if they become pregnant than are teenage women whose partners are Hispanic or of "other races."

In a logit model of whether a nonmarital teenage pregnancy leads to a nonmarital birth instead of to a marital birth, the results are similar to the results for the corresponding portion of the multinomial logit model shown in Table 4. The only notable difference is that the coefficient for nonmarital births among teenage women with a Hispanic partner is not statistically significant.

Discussion

During the period 1982–1994, more than one-sixth of teenage women who had nonmarital sexual intercourse became

pregnant during their first sexual relationship. The most common outcome of these pregnancies was a nonmarital birth, although more than one-third ended in an abortion. Fewer than one-fifth of nonmarital teenage pregnancies investigated here led to a marital birth.

The data set used here, the 1995 NSFG, provides more extensive coverage of the characteristics of nonmarital sexual partners than previous surveys. This allows for an examination of how both partners' characteristics, as well as differences or similarities in attributes, influence nonmarital teenage pregnancy and its resolution. The findings indicate that several characteristics of teenage women and their partners appear to influence the likelihood of pregnancy and its outcome.

As suggested by previous research that examined age differences between adolescent women and their partners, the majority of women are younger than their first partner. Age differences appear to influence pregnancy outcomes, and women who are older than their first partner are more likely to become pregnant than women who are about the same age as their partner. When other characteristics are controlled for, however, the likelihood of a pregnancy is not higher among women who are younger than their partner. The results do not vary if age categories other than those reported here are used. This finding contrasts with previous results indicating that, when the effects of other characteristics are not taken into account, teenage women who are at least three years younger than their partner are more likely to become pregnant than other teenagers. This difference in results suggests that couples with age differences differ in other ways from couples with similar ages, and that these additional differences may account for the variation in the likelihood of pregnancy.

Some of the other estimated relationships between partners' characteristics and the probability of a nonmarital teenage pregnancy and its outcome reported here also differ from previous findings using other data sets. For example, the results indicate that teenage women who are older at first intercourse are less likely to become pregnant than teenagers who are younger, but women's age does not significantly affect how a pregnancy is resolved. Previous research, in contrast, finds that age is not significantly associated with the likelihood of a nonmarital pregnancy but affects how a pregnancy is resolved. Family structure affects the likelihood of pregnancy, as in a previous study; contrary to previous find-

ings, however, family structure does not appear to significantly influence how a nonmarital teenage pregnancy is resolved. These differences from previous studies may be due in part to differences in data source, sample selection criteria, time period examined and the variables included in the analysis.

For the demographic characteristics examined here, the results indicate few differences between controlling for only one partner's characteristics and for both partners' characteristics. This finding suggests that each partner's characteristics have an independent influence on nonmarital teenage pregnancy and its resolution and that previous studies that focused on one partner's characteristics did not reach erroneous conclusions. However, an examination of joint characteristics gives some new insights into fertility behavior. Racial and ethnic differences appear to influence the outcome of a nonmarital teenage pregnancy, and differences in religious affiliation affect the likelihood that a pregnancy will occur.

The results reported here are based on data corrected for underreporting of abortions. A comparison with other data sources suggests that at least one-half of teenage abortions are not reported in the NSFG. Despite this extensive underreporting, the results here are not sensitive to correction for underreporting or to examination only of pregnancies that lead to births.

The method used here to impute abortion probabilities is subject to several caveats. First, it is based only on year and race. Education, income, religion and other characteristics may also affect abortion underreporting, but this variation could not be captured here because comprehensive data on the number of abortions stratified by such characteristics of the woman are not available. The sample used here is fairly homogenous, as it consists only of women aged 15–19 who had never been married when they first had intercourse; more complex methods

would be needed to analyze samples with broader age ranges and other marital status categories. Future research should use multiple imputation methods and other techniques to examine the sensitivity of results to different methods of correcting for abortion underreporting. In addition, the abortion totals include all abortions, not just first abortions, so the imputed likelihood of abortion here is an overestimate.

The results of this study provide a starting point for examining both partners' role in pregnancy probabilities and outcomes. This study focuses on nonmarital pregnancies that occur during teenage women's first sexual relationship, but many women in their 20s also have nonmarital pregnancies. Indeed, both the number and the rate of nonmarital births were higher among women aged 20–24 than among women aged 15–19 during the early 1990s.²⁸ The effect of a man's characteristics may change as a woman becomes older, and a man may play a larger role in a couple's decision-making if the woman is not a teenager. Further research using data sets that include the characteristics of both partners is needed to fully understand the joint effects of women's and men's background on reproductive choices. The role of both partners' characteristics in contraceptive usage and their effect on the likelihood of pregnancy should also be investigated.

This study relies on data reported by women. Many women did not report all of the characteristics of their first partner, and the likelihood that a woman remembers the man's background appears to depend on whether she became pregnant and whether the pregnancy led to marriage. Self-reported data from both partners might give different inferences about the relationship between partners' characteristics and the likelihood of nonmarital pregnancy and its outcome.

Another limitation of the data that indicates the need for further research is the lack of policy variables in the NSFG. The data set does not include women's place of residence during their adolescence, making it difficult to examine the effect of the availability of contraceptive and abortion providers.* In addition, the data are not ideal for investigating the influence of welfare benefits and other public policy variables or the impact of labor market conditions on pregnancy probabilities and outcomes.

The findings suggest several potential roles for public policy. Women who are older at first intercourse are less likely to have a nonmarital pregnancy, suggesting

that policies that persuade women to delay intercourse may lower nonmarital pregnancy rates, especially those among teenagers. When the effect of the man's age is taken into account, the male partner's education is negatively associated with the likelihood of a nonmarital pregnancy, indicating that policies that encourage men to remain in school may also lower nonmarital teenage pregnancy rates.

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(continued on page 205)

*Confidential data available on request from the National Center for Health Statistics include the state of a woman's birth and her state of residence in 1990, 1993 and at the time of the survey. These could be used to infer women's state of residence at the time they reached age 15 or became pregnant. Previous drafts of this article that used this geographic data matched with policy variables from other data sources found that the availability of abortion providers in the birth state during the year a woman became pregnant affected how the pregnancy was resolved, whereas welfare benefits did not. These results are not shown here because they require an assumption that women lived in their birth state; this assumption creates unquantifiable measurement error and also requires dropping foreign-born women. The coefficients on the other variables, which are also included here, were not affected by including policy variables.

The Effects of Partners' ...

(Continued from page 199)

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