Racial and Ethnic Differences in the Transition To a Teenage Birth in the United States

CONTEXT: *Rates of teenage childbearing are high in the United States, and they differ substantially by race and ethnicity and nativity status.*

METHODS: *Data from the National Longitudinal Survey of Youth 1997 cohort were used to link characteristics of white, black, U.S.-born Hispanic and foreign-born Hispanic adolescents to teenage childbearing. Following a sample of 3,294 females aged 12–16 through age 19, discrete-time logistic regression analyses were used to examine which domains of teenagers' lives were associated with the transition to a teenage birth for each racial and ethnic group, and whether these associations help explain racial and ethnic and nativity differences in this transition.*

RESULTS: *In a baseline multivariate analysis controlling for age, compared with whites, foreign-born Hispanics had more than three times the odds of a teenage birth (odds ratio, 3.5), while blacks and native-born Hispanics had about twice the odds (2.1 and 1.9, respectively). Additional controls (for family environments; individual, peer and dating characteristics; characteristics of first sexual relationships; and subsequent sexual experience) reduced the difference between blacks and whites, and between foreign-born Hispanics and whites, and eliminated the difference between U.S.-born Hispanics and whites. Further, if racial or ethnic minority adolescents had the same distribution as did white teenagers across all characteristics, the predicted probability of a teenage birth would be reduced by 40% for blacks and 35% for U.S.-born Hispanics.*

CONCLUSIONS: *Differences in the context of adolescence may account for a substantial portion of racial, ethnic and nativity differences in teenage childbearing.*

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Despite years of overall decline, rates of teenage childbearing are higher in the United States than in other industrialized nations, and they differ substantially by race and ethnicity.[1] Historically, blacks had higher teenage birthrates than Hispanics and whites; however, since the mid-1990s, Hispanics have had the highest rates.[2] Among Hispanics, teenage birthrates differ by nativity status: Rates are higher among those born outside, rather than within, the United States.[3] In most research, however, this difference is overlooked.[4]

Researchers suggest that many factors contribute to racial and ethnic differences in teenage birthrates, including greater socioeconomic disadvantage, greater levels of sexual risk-taking and other problem behaviors, and greater acceptance of teenage childbearing among some minority populations than among whites.[5–7] A better understanding of racial and ethnic differences in family, individual and relationship characteristics, and of their association with having a teenage birth, may help inform pregnancy prevention programs about their target populations.

In this article, we use data from the National Longitudinal Survey of Youth (NLSY) 1997 cohort to examine associations between family, individual, peer, dating and relationship characteristics and the risk of teenage childbearing. We assess whether racial and ethnic differences in teenage childbearing remain after controlling for these characteristics; whether changing certain characteristics of blacks and Hispanics to match those of whites would reduce their predicted probability of having a teenage birth; and whether certain types of characteristics are stronger correlates of teenage childbearing for specific racial and ethnic groups than for others.

BACKGROUND

We incorporate ecological and life-course perspectives for examining important domains of the lives of adolescents that may be associated with having a teenage birth, as well as racial and ethnic differences in teenage childbearing. The ecological model, which posits that multiple dimensions of an adolescent's life are associated with behavioral outcomes, is especially important for understanding the context of teenage childbearing.[8] This framework is complemented by the life-course perspective, which considers the history that adolescents bring to decision-making.[9] Thus, we examine early family environments and individual, peer and dating behaviors that may be associated with the transition to a teenage birth. We also draw on the life-course principle that individual behavior can be understood only within the context of one's relationships[10] by examining how the context of first and subsequent sexual

relationships—and contraceptive use within them—are associated with teenage childbearing.

Both perspectives recognize that the heterogeneous life experiences of different subpopulations may have important consequences for childbearing behaviors. In the United States, race and ethnicity are among the most important social categories, stratifying people into groups with diverse histories and social experiences.[11] In part because of these experiences, adolescents from different racial and ethnic groups vary dramatically in their family, individual and relationship characteristics.[1,12] Thus we hypothesize that these racial and ethnic differences may help explain disparities in teenage childbearing.

Some researchers also argue that racial and ethnic groups' different social and historical experiences have made teenage childbearing more normative in certain populations, as well as made some teenagers less able to achieve the overall norm of delayed childbearing because of the presence of certain structural barriers (e.g., neighborhood poverty, discrimination).[5,6] For example, not only do black and Hispanic teenagers have higher childbearing rates than whites, but some evidence suggests that they identify a younger ideal age at first birth.[6] Some researchers have suggested that a strong cultural orientation toward motherhood may also uniquely shape the childbearing behavior of Hispanics, particularly those who are foreign-born.[13] To the extent that groups differ either in norms or in the ability to achieve norms, associations between the context of adolescence and teenage childbearing may vary across racial and ethnic groups. For example, some research suggests that the association between teenage childbearing and living in a family that does not include two biological parents is weaker among blacks than among whites, in part because a larger proportion of blacks live in this type of family.[14]

Family Background

Research over several decades has found that family background characteristics are associated with teenage childbearing. Several researchers—including Meade and colleagues,[15] who used a subsample of the data we use in this study—have linked an increased risk of teenage pregnancy with lower parental education, growing up in a household that did not include two biological parents and having a mother who had had a teenage birth.[15–17] Parenting style is also associated with teenage childbearing: Adolescents with authoritative parents (defined as parents who are both warm and strict) are at a lower risk of giving birth than are those whose parents are authoritarian (strict but not warm), permissive (warm but not strict) or uninvolved (neither warm nor strict).[17] However, this association may differ by race and ethnicity. For example, one study found that authoritarian parenting styles may not be as strongly linked to negative outcomes among racial and ethnic minorities as they are among whites.[18] In addition, evidence suggests that family structure instability—which is more prevalent among racial and ethnic minorities, particularly blacks, than among whites—helps explain racial and ethnic differences in early sexual activity.[19] Thus, we hypothesize that differences in socioeconomic disadvantage and family instability may contribute to racial and ethnic differences in teenage childbearing. We also hypothesize that more authoritative parenting styles among whites and more authoritarian parenting among Hispanics[20] may help explain these differences.

Individual Characteristics

Individual characteristics are also linked to the risk of a teenage birth. For example, older teenagers have a much higher birthrate than younger teenagers, in part because of a longer exposure to the risk of unprotected sex.[2] Early menarche is another potential risk factor for early sexual behavior and thus teenage childbearing.[7,21] Delinquency and behavioral problems such as physical fighting, gang involvement and substance use are associated with an increased risk of a teenage birth.[21,22] In contrast, higher educational engagement, performance and achievement are associated with a reduced risk of teenage pregnancy and childbearing.[15,23] Peer and dating environments are also important; for example, one study using the 1997 NLSY data found that a history of dating was associated with an increased risk of a teenage birth, as was having peers who engaged in high-risk behaviors, such as substance use.[15]

Blacks, Hispanics and whites have different individual, peer and dating environments, which may help account for differences in their risk of a teenage birth. Black adolescents reach menarche earlier[24] and date less[25] than other groups. Compared with white adolescents, black and Hispanic adolescents have lower average grades in school and are more likely to engage in some problem behaviors.[12,26] For example, Hispanic teenagers have particularly high rates of substance abuse and are more likely than blacks or whites to belong to gangs;[27] foreign-born Hispanics are more likely than native-born Hispanics to engage in risky behaviors.[28] In addition, black adolescents have the highest rates of juvenile detention, although they have lower levels of drug and cigarette use than whites.[26]

We hypothesize that differences in age at menarche, frequency of dating, educational performance and problem behaviors help explain racial and ethnic differences in teenage childbearing.

Relationship Context and Sexual Behaviors

Teenagers' sexual experiences are also associated with the risk of a teenage birth. A younger age at first sex is associated with a greater risk of teenage childbearing,[21] while contraceptive use at first sex is linked to increased subsequent contraceptive use and consistency[29] and a reduced risk of teenage childbearing.[30] Contraceptive method effectiveness and consistency of contraceptive use across relationships are negatively associated with the risk of teenage childbearing.[31]

A teenager's first sexual relationship is of particular importance because it often sets the stage for subsequent

relationship experiences. Early casual sexual relationships are associated with subsequent casual sexual relationships,[32] reduced contraceptive use[33] and an increased number of sexual partners,[34] all of which heighten the risk of a teenage birth.[7,17] Having an older sexual partner is associated with an elevated risk of teenage childbearing,[35] and among white teenagers, having a sexual partner who is of a different race or ethnicity is associated with reduced contraceptive consistency,[31] and thus greater odds of teenage childbearing.

Racial and ethnic differences in sexual relationships and behaviors may help explain differences in the risk of a teen birth. On average, blacks become sexually active at an earlier age than whites or Hispanics. In addition, although foreign-born Hispanics have sex later than U.S.-born Hispanics,[36] they also have especially low rates of contraceptive use, consistency and efficacy.[37] Some research suggests that blacks are more likely than other groups to be involved in casual sexual relationships,[32] and blacks and Hispanics, particularly U.S.-born Hispanics, are more likely to have partners of a different race or ethnicity.[33,38] Having an older sexual partner is more common among foreign-born teenagers than native-born teenagers of all races and ethnicities.[39]

We hypothesize that differences in age at first sex, contraceptive use, casual sexual relationships and partner characteristics may help to account for racial and ethnic differences in teenage births.

METHODS

Data and Sample

The NLSY, a study sponsored and directed by the Bureau of Labor Statistics, U.S. Department of Labor, provides interview data from a nationally representative sample of 8,984 individuals who were aged 12–16 as of December 31, 1996; respondents were first interviewed in 1997. From a sample of 4,385 females, we excluded respondents who had had a first birth prior to the baseline interview (93 adolescents); had not engaged in sexual intercourse by age 19 (994); or were not white, black or Hispanic (four). Thus, our final sample comprised 3,294 female respondents.* One parent (generally the biological mother) was also interviewed in 1997. The data provide valuable information on adolescents' sexual experiences, contraceptive use, family background, individual risk-taking, and social and demographic characteristics. We included annual follow-up data through 2004 (when more than 99% of the sample had reached age 20).

Because we used event history methods to model the transition to a first teenage birth, we converted the person-level data into a person-year format, consisting of a separate observation for each year in which a respondent was in our sample and at risk of having a first birth through age 19. Respondents were censored in the year they gave birth or at age 20 if they had not had a birth. Respondents with missing data on fertility measures were censored in the round prior to the one with missing data. The final sample provided 11,356 person-years of information; each respondent contributed an average of 3.5 person-years.

Measures

•*Outcome.* At each round of the survey, respondents reported the birth date of any children they had had since the prior interview. We combined this information with the interview date to create a round-specific indicator of a teenage birth.

•*Demographic characteristics.* Racial and ethnic categories were based on respondents' identification as white, black or Hispanic; for Hispanics, we used an indicator of nativity to distinguish U.S.-born and foreign-born adolescents. We also included a time-varying measure of respondents' age.

•*Family background.* We measured parents' education, parenting style, family structure and maternal fertility history at Round 1. Parents' education was a four-category measure indicating the highest level of schooling attained by the residential parent with the most education (less than high school, high school, some college or at least a four-year degree). Family structure assessed whether teenagers lived with two biological or adoptive parents, with one biological or adoptive parent and one stepparent, with a single biological or adoptive parent, or in some other family type. Maternal fertility history measured whether the respondent's mother was younger than age 20 at her first birth, as reported by the mother. Parenting style, based on adolescents' report of their mother's strictness and supportiveness,† was developed using the four-style typology proposed by Maccoby and Martin.[40] Strict and supportive parents were identified as authoritative, parents who were strict but not supportive were identified as authoritarian, parents who were supportive but not strict were identified as permissive, and parents who were neither strict nor supportive were identified as uninvolved.

•*Individual, peer and dating characteristics.* Respondents' average grades during eighth grade were measured with a retrospective, self-reported 10-point scale (1=mostly lower than D's to 10=mostly A's) in the earliest available round.‡

*Compared with females who remained in our final sample, those who were excluded had more highly educated parents; a higher proportion of them lived in a two-parent household, and a lower proportion were daughters of women who had first given birth as teenagers. The vast majority of those dropped from the sample had first had sex at age 19 or later (98%).

†To determine strictness, respondents were asked, "In general, would you say your mother is permissive or strict about making sure you did what you were supposed to do?" Responses were coded as two categories. To determine supportiveness, respondents were asked, "When you think about how your mother acts toward you, in general, would you say [she] is very supportive, somewhat supportive, or not very supportive?" Responses were coded as two categories: very supportive and somewhat or not very supportive. We used reports of fathers' parenting style if information on mothers' parenting style was not available.

‡Adolescents with a history of formal schooling who were in eighth grade or higher and had not previously reported on their grades were asked this question at each round until 2002.

We also used three indices, all measured at Round 1, to capture individual and peer behaviors. The first index was the total number of delinquent acts the adolescent reported (out of 10, such as having run away, been in a gang or stolen something). The second index was a three-item summative count of the substances (cigarettes, alcohol and marijuana) adolescents reported having tried. We measured negative peer characteristics with a five-item index in which respondents received a point for reporting that at least 25% of their classmates had engaged in each of the following activities: smoking, getting drunk often, doing drugs, being in a gang and skipping classes. Respondents also reported in Round 1 whether they had dated in the last year. We also included an indicator of puberty, measured as the age, in years, at which the respondent reported menarche.

•*First sexual relationship characteristics.* We included the age at which respondents first had sexual intercourse with a person of the opposite sex, as well as characteristics of this relationship, in the round in which first sex occurred. Respondents reported the type of their relationship with their first partner (just met/just friends/other, occasional dating, steady dating, engaged/cohabiting/married), their partner's age (from which we assessed the age difference, in years, between partners), and the partner's race or ethnicity (from which we assessed whether the partner was of a different race or ethnicity). We also included a dichotomous indicator of whether respondents had used a contraceptive method at first sex.

•*Sexual experience and contraceptive use.* We included three time-varying measures of sexual behavior and contraceptive use. In each survey round, respondents reported the number of sex partners they had had since their last interview (ranging from zero to 10 or more). Our second time-varying variable measured the method of contraception used at that round of interview or at most recent sex.* We coded the 10 response categories (1=nonuse/other and 2–10 correspond to a list of methods) so that higher scores indicated the use of more effective methods, as determined by efficacy rates reported in *Contraceptive Technology*.[41] We also measured contraceptive consistency (the proportion of sex acts in which the respondent used contraceptives) in the past 12 months.

Analysis

We conducted t tests and chi-square analyses to examine bivariate differences in family background, individual characteristics and sexual experiences between whites, blacks, U.S.-born Hispanics and foreign-born Hispanics. We also explored the bivariate relationship between these characteristics and having a teenage birth, by race and ethnicity. Because the sample of foreign-born Hispanics was small (130), we were unable to examine associations separately for U.S.-born and foreign-born Hispanics.

We then used event history methods to examine the transition to a first teenage birth for the full sample. Specifically, we used person-year data to estimate a series of discrete-time logistic regression models. The first model examined racial and ethnic differences in the transition to a teenage birth, controlling for respondent age. Models 2–5 cumulatively add family background characteristics; individual, peer and dating characteristics; characteristics of the first sexual relationship; and time-varying measures of sexual experience to assess whether they reduce the size and significance of the association between race, ethnicity and nativity categories and having a teenage birth. Multivariate results are presented as odds ratios.

To help interpret findings from the full multivariate model (model 5), we next estimated predicted probabilities of a teenage birth for each racial, ethnic and nativity subgroup, using each group's average family, individual and sexual characteristics. For comparison, we also estimated racial and ethnic minorities' hypothetical probability of having a teenage birth were they to have certain characteristics of the white population.

Finally, we examined multivariate results for whites, blacks and Hispanics (both native-born and foreign-born) separately, and ran t tests comparing the odds ratios across groups, to assess whether associations varied by race and ethnicity.†

Fewer than 5% of data were missing for any variable except partner age (11%) and mother's fertility history (6%). All analyses were weighted and conducted in Stata 11.0, and multiple imputation was used for missing data.[42]

RESULTS

Sample Characteristics

In our sample, foreign-born Hispanics were the group with the highest proportion of teenage births (42%), followed by blacks (30%), U.S.-born Hispanics (28%) and whites (17%), although not all respondents were followed until age 20 (Table 1).

Family background varied across racial, ethnic and nativity groups. Blacks and Hispanics had less-educated parents than whites, and foreign-born Hispanics reported the lowest levels of parental educational attainment (63% reported that their parents had less than a high school education). White and foreign-born Hispanic teenagers were more likely than other teenagers to live with two biological or adoptive parents. The proportion of respondents reporting that their mothers had given birth as teenagers was lowest among white adolescents and second-lowest among U.S.-born Hispanics.

*From 1997 to 1999, respondents were asked what method they used most often; from 2000 to 2004, they were asked the method used at last sex.

†We collapsed two of our categorical variables (family structure and relationship status) into dichotomous ones to provide model stability within subgroups. To check for multicollinearity and to determine the stability of our coefficients in general, we had the statistical package randomly divide our subgroup samples into two groups and ran the full model for each. Categories were combined for variables whose coefficients were unstable between the two samples.

TABLE 1. Selected characteristics of female members of the National Longitudinal Survey of Youth 1997 cohort, by race and ethnicity and nativity

Characteristic	Total (N=3,294)	White (N=1,723)	Black (N=884)	U.S.-born Hispanic (N=557)	Foreign-born Hispanic (N=130)
DEMOGRAPHIC CHARACTERISTICS					
Had a teenage birth	20.3	16.5	29.6*	28.3*	41.9*,†,‡
Mean age at baseline (range, 12–17)§	14.40	14.42	14.33	14.30	14.46
FAMILY BACKGROUND					
Parent education					
<high school	13.1	8.4	19.2*	29.1*	62.8*,†,‡
High school	32.6	31.6	41.3	30.3	19.3
Some college	27.7	28.8	26.1	25.3	10.6
≥college	26.6	31.2	13.3	15.3	7.3
Family structure**					
Two parents	49.7	54.5	26.9*	48.1*,†	60.8†,‡
One parent and one stepparent	15.9	16.9	13.3	13.8	12.2
Single parent	30.5	25.9	49.9	34.5	25.7
Other	3.9	2.7	10.0	3.6	1.4
Mother had a teenage birth	25.7	21.8	40.9*	27.0*,†	45.6*,‡
Parenting style					
Authoritative	38.1	37.7	40.5	38.2	34.8
Authoritarian	14.8	14.2	17.1	16.2	14.0
Permissive	34.8	36.5	31.3	29.3	29.9
Uninvolved	12.3	11.7	11.1	16.3	21.4
INDIVIDUAL, PEER AND DATING CHARACTERISTICS					
Mean eighth-grade grades (range, 1–10)	7.42	7.63	6.81*	7.01*	6.64*
Mean delinquency index score (range, 0–9)††	1.08	1.06	1.08	1.32*	0.58*,†,‡
Mean substance use index score (range, 0–3)	1.21	1.30	0.85*	1.25†	0.53*,†,‡
Mean no. of negative peer characteristics (range, 0–5)	3.17	3.13	3.28*	3.28	3.29
Mean age at menarche (range, 13–19)	12.15	12.24	11.91*	11.87*	11.96*
Any dating in year before baseline	53.8	58.5	36.1*	52.8*,†	27.9*,‡
FIRST SEXUAL RELATIONSHIP					
Mean age at first sex	16.04	16.08	15.83*	16.03	16.56*,†,‡
Relationship status					
Just met/just friends/other	18.2	18.0	21.0	16.1†	13.3*,†,‡
Occasional dating	7.7	7.9	6.7	8.8	2.8
Steady dating	69.3	69.7	69.9	67.7	57.8
Engaged/cohabiting/married	4.9	4.4	2.4	7.4	26.2
Mean partner age difference (range, −5 to 15)	1.95	1.89	2.07	2.16	2.16
Partner of different race/ethnicity	20.3	19.3	14.0*	38.9*,†	13.6‡
Contraceptive use at first sex	81.0	82.6	81.8	73.1*,†	57.4*,†,‡
SEXUAL EXPERIENCE AND CONTRACEPTIVE USE					
Mean no. of partners in last year (range, 0–10)	1.82	1.87	1.73	1.73	1.53
Mean effectiveness of contraceptive method at last sex (range, 1–10)	6.26	6.29	6.19	6.18	6.13
Mean contraceptive consistency (range, 0–1)	0.79	0.81	0.80	0.70*,†	0.67*,†

*Different from the mean or distribution for whites at p<.05. †Different from the mean or distribution for blacks at p<.05. ‡Different from the mean or distribution for U.S.-born Hispanics at p<.05. §Although respondents were aged 12–16 as of screening, some were aged 17 as of their interview. **Parents may be either biological or adoptive. ††Although there were 10 points possible in this index, this range reflects the responses among our sample. *Note:* Data are percentages unless otherwise noted.

We also found racial and ethnic differences in individual, peer and dating characteristics. Whites reported higher grades in eighth grade than any other group, and foreign-born Hispanics reported the lowest level of delinquency. Whites and U.S.-born Hispanics had higher average substance use scores than blacks and foreign-born Hispanics. Whites had a slightly higher age at menarche than blacks and Hispanics, and a higher proportion of whites than of any other group reported dating in the year prior to baseline.

Although foreign-born Hispanics, on average, initiated sex about 6–9 months later than other groups, they also had the lowest levels of contraceptive use at first intercourse. Additionally, a higher proportion of U.S.-born Hispanics than of any other group had a partner of a different race or ethnicity; the majority of these partners were white (73%—not shown). Whites and blacks were also more consistent contraceptive users than both U.S.- and foreign-born Hispanics.

TABLE 2. Selected characteristics of respondents, by race and ethnicity and teenage childbearing status

Characteristic	Full sample		White		Black		Hispanic†	
	No teenage birth	Teenage birth	No teenage birth	Teenage birth	No teenage birth	Teenage birth	No teenage birth	Teenage birth
DEMOGRAPHIC CHARACTERISTIC								
Mean age at baseline (range, 12–17)	13.81	14.26***	13.83	14.31***	13.75	14.11**	13.73	14.29***
FAMILY BACKGROUND								
Parent education								
<high school	11.7	29.6***	7.1	22.3***	18.2	31.3***	32.1	49.7**
High school	31.6	37.4	30.5	36.5	39.2	45.3	28.5	30.0
Some college	28.6	23.4	28.9	28.3	29.0	19.5	26.2	13.4
≥college	28.1	9.7	33.4	13.0	13.6	3.9	13.2	6.9
Family structure‡								
Two parents	52.6	34.1***	56.9	35.4***	30.9	18.9**	53.2	49.2
One parent and one stepparent	15.4	18.1	16.2	21.1	13.6	12.3	12.7	16.4
Single parent	29.1	40.6	25.0	37.9	46.3	55.3	32.5	30.2
Other	3.0	7.3	2.0	5.6	9.3	13.5	1.7	4.2
Mother had a teenage birth	23.0	43.1***	19.7	38.7***	36.8	52.3***	26.1	44.7***
Parenting style								
Authoritative	39.9	65.2***	40.2	30.3***	40.0	44.9	37.4	37.9
Authoritarian	15.1	16.3	14.2	18.1	19.4	13.0	15.7	15.3
Permissive	34.5	28.0	36.0	28.4	29.8	28.3	31.0	25.6
Uninvolved	10.5	20.5	9.6	23.1	10.8	13.8	16.0	21.3
INDIVIDUAL, PEER AND DATING CHARACTERISTICS								
Mean eighth-grade grades (range, 1–10)	7.58	6.31***	7.79	6.25***	6.92	6.34***	7.09	6.49**
Mean delinquency index score (range, 0–9)§	0.91	1.51***	0.89	1.63***	0.98	1.16	0.91	1.53**
Mean substance use index score (range, 0–3)	0.98	1.40***	1.05	1.68***	0.68	0.86*	0.91	1.19*
Mean no. of negative peer characteristics (range, 0–5)	2.76	3.38***	2.70	3.39***	2.97	3.29**	2.89	3.45***
Mean age at menarche (range, 13–19)	12.11	12.01	12.21	12.08	11.81	12.00	11.84	11.83
Any dating in year before baseline	43.7	56.2***	48.0	66.7***	26.4	35.0*	38.7	50.7***
FIRST SEXUAL RELATIONSHIP								
Mean age at first sex	16.16	15.19***	16.18	15.05***	15.95	15.37***	16.30	15.42***
Relationship status								
Just met/just friends/other	18.4	19.1*	18.1	21.2	21.9	17.9	16.1	14.4
Occasional dating	7.4	8.4	7.7	10.0	6.0	4.6	6.9	8.3
Steady dating	69.8	65.4	70.0	62.8	70.0	72.9	67.8	63.5
Engaged/cohabiting/married	4.5	7.1	4.2	6.0	2.0	4.7	9.3	13.9
Mean partner age difference (range, –5 to 15)	1.87	2.30***	1.83	2.35**	1.95	2.26	2.04	2.22
Partner of different race/ethnicity	21.1	21.2**	19.4	25.2*	15.8	13.5	38.8	18.1***
Contraceptive use at first sex	82.2	71.6***	83.3	74.4**	82.8	74.1*	74.9	59.9**
SEXUAL EXPERIENCE AND CONTRACEPTIVE USE								
Mean no. of partners in last year (range, 0–10)	1.70	1.88*	1.72	2.12***	1.63	1.63	1.71	1.49
Mean effectiveness of contraceptive method at last sex (range, 1–10)	6.28	6.22	6.30	6.16	6.20	6.31	6.17	6.30
Mean contraceptive consistency (range, 0–1)	0.82	0.66***	0.83	0.67***	0.82	0.72***	0.74	0.55***

*Different from the mean or distribution for no teenage birth at p<.05. **Different from the mean or distribution for no teenage birth at p<.01. ***Different from the mean or distribution for no teenage birth at p<.001. †U.S.- and foreign-born Hispanics. ‡Parents may be either biological or adoptive. §Although there were 10 points possible in this index, this range reflects the responses among our sample. *Note:* Data are percentages unless otherwise noted.

Bivariate Results

Young women who had had a teenage birth were older at baseline, had less-educated parents and were more likely to have a mother who had been a teenage mother than others (Table 2). For whites and blacks, a lower proportion of women who had had a teenage birth than of those who had not had grown up with two biological or adoptive parents. Among whites, those who had had a teenage birth were more likely than those who had not to report that their parents were authoritarian or uninvolved; they were less likely than whites with no teenage birth to report authoritative or permissive parenting. In each racial and ethnic group, teenage childbearing was negatively associated with grades and positively associated with level of substance abuse, number of negative peer characteristics and dating experience. Among whites and all Hispanics, levels of delinquency were also higher among those who had had a teenage birth than among those who had not.

Overall and in each racial and ethnic group, young women who had had a teenage birth were younger than others at first sex, and a lower proportion of them had used contraceptives at first sex. White females who had had a teenage birth reported having a wider age gap relative to their first sexual partners than those who had not

been teenage mothers. Among whites, those who had had a teenage birth were more likely than those who had not to have had a partner of a different race or ethnicity; among Hispanics, the opposite was true. Whites who had given birth as teenagers reported more sexual partners in the past year than other white women, and among all groups, contraceptive consistency was lower for those who had had a teenage birth than for those who had not.

Multivariate Results

The first multivariate model (Table 3) indicates that net of age, blacks' and native-born Hispanics' odds of having had a teenage birth were about twice those of whites (odds ratios, 2.1 and 1.9, respectively); foreign-born Hispanics' odds of this outcome were more than three times those of whites (3.5). The inclusion of family background characteristics (model 2) substantially reduced, but did not eliminate, these differences. In model 2, compared with adolescents whose parents had completed high school, those whose parents had less education had 59% greater odds of a teenage birth, and those whose parents had more schooling had lower odds (0.4–0.7). Living in a household that lacked two biological or adoptive parents was associated with increased odds of a teenage birth (1.6–2.6), as was having a mother who had given birth as a teenager (1.7). Finally, when compared with authoritative parenting, uninvolved parenting was associated with 73% higher odds of a teenage birth.

With the addition of individual, peer and dating characteristics (model 3), U.S.-born Hispanics no longer had greater odds of a teenage birth than did whites. Each one-point increase in grades (on a 10-point scale) was associated with a 13% reduction in the odds of a birth. Scores on the substance abuse index were positively associated with the odds of a teenage birth (odds ratio, 1.2), as was any dating experience in the year before baseline (1.4). In this model, permissive parenting became associated with reduced odds of a teenage birth (0.8), compared with authoritative parenting style, while uninvolved parenting was no longer associated with teenage childbearing.

When characteristics of the respondent's first sexual relationship were added (model 4), U.S.-born Hispanics again had significantly elevated odds of having had a teenage birth (odds ratio, 1.4). Age at first sex and contraceptive use at first sex were negatively associated with teenage childbearing: Each additional year of age at first sex was associated with a 26% reduction in the odds of a teenage birth, and use of contraceptives was associated with a 39% reduction in these odds. In contrast, respondents who had been engaged, cohabiting or married at first sex had 57% higher odds of a teenage birth than those who had been in a steady dating relationship.

After inclusion of the time-varying sexual experience characteristics (model 5), differences between whites and other groups in the odds of teenage childbearing were either fully attenuated (for U.S.-born Hispanics) or reduced (for blacks and foreign-born Hispanics), compared with those from model 1. Number of sexual partners and consistent contraceptive use in the past year were negatively associated with the likelihood of a teenage birth (odds ratios, 0.9 and 0.3, respectively). In this model, relationship status and contraceptive use at first sex were no longer associated with teenage childbearing.

TABLE 3. Odds ratios from discrete-time logistic regression analyses assessing associations between respondents' characteristics and their likelihood of having had a teenage birth

Characteristic	Model 1	Model 2	Model 3	Model 4	Model 5
DEMOGRAPHIC CHARACTERISTICS					
Race/ethnicity					
White (ref)	1.00	1.00	1.00	1.00	1.00
Black	2.12***	1.31*	1.50***	1.49**	1.46**
U.S.-born Hispanic	1.88***	1.36*	1.33	1.37*	1.23
Foreign-born Hispanic	3.48***	1.83**	2.17***	1.94**	1.70*
Age	1.30***	1.34***	1.30***	1.36***	1.34***
FAMILY BACKGROUND					
Parent education					
<high school	na	1.59**	1.68***	1.65***	1.60**
High school (ref)	na	1.00	1.00	1.00	1.00
Some college	na	0.71*	0.75*	0.77	0.78
≥college	na	0.39***	0.44***	0.47***	0.51***
Family structure†					
Two parents (ref)	na	1.00	1.00	1.00	1.00
One parent and one stepparent	na	1.63***	1.42*	1.39*	1.38*
Single parent	na	1.57***	1.31*	1.25	1.25
Other	na	2.60***	2.21***	2.15***	2.12***
Mother had a teenage birth	na	1.72***	1.67***	1.57***	1.64***
Parenting style					
Authoritative (ref)	na	1.00	1.00	1.00	1.00
Authoritarian	na	1.07	0.85	0.84	0.86
Permissive	na	0.85	0.76*	0.73**	0.73*
Uninvolved	na	1.73***	1.27	1.21	1.20
INDIVIDUAL, PEER AND DATING CHARACTERISTICS					
Eighth-grade grades	na	na	0.87***	0.90***	0.91***
Delinquency index	na	na	1.05	1.00	0.98
Substance use index	na	na	1.15*	1.07	1.06
Negative peer characteristics	na	na	1.03	1.05	1.05
Age at menarche	na	na	1.00	1.04	1.05
Any dating in year before baseline	na	na	1.40**	1.27*	1.31*
FIRST SEXUAL RELATIONSHIP					
Age at first sex	na	na	na	0.74***	0.74***
Relationship status at first sex					
Just met/just friends/other	na	na	na	0.81	0.82
Occasional dating	na	na	na	0.97	0.98
Steady dating	na	na	na	1.00	1.00
Engaged/cohabiting/married	na	na	na	1.57*	1.41
Partner age difference	na	na	na	1.01	1.01
Partner of different race/ethnicity	na	na	na	1.01	1.05
Contraceptive use at first sex	na	na	na	0.61***	0.96
SEXUAL EXPERIENCE AND CONTRACEPTIVE USE‡					
No. of partners in last year	na	na	na	na	0.91**
Effectiveness of contraceptive method at last sex	na	na	na	na	1.02
Contraceptive consistency	na	na	na	na	0.30***
F statistic	*39.93****	*29.06****	*26.13****	*25.16****	*23.02****
df	*4*	*14*	*20*	*27*	*30*

*p<.05.**p<.01.***p<.001.†Parents may be either biological or adoptive.‡Measures are time-varying. *Notes:* Calculations are based on 11,356 person-years of information. na=not applicable. ref=reference group.

TABLE 4. Predicted probabilities (percentages) from discrete-time logistic regression analyses assessing the likelihood of a teenage birth, by groups of characteristics, according to race and ethnicity

Scenario	White	Black	U.S.-born Hispanic	Foreign-born Hispanic
Average subgroup characteristics†	4.0	8.5	7.5	12.1
White family background‡	na	5.9*	5.6	8.2
White grades and dating	na	8.3	7.2	11.8
White age at first sex	na	7.9	7.4	13.8
White no. of partners and contraceptive consistency	na	8.1	6.8	10.1
White characteristics significant in the final model§				
All	na	5.1***	4.9*	8.0
All except dating	na	4.9***	4.8*	7.5
All except dating, family structure	na	5.3**	4.9*	7.3

*Different from the figure in the first row at p<.05. **Different from the figure in the first row at p<.01. ***Different from the figure in the first row at p<.001. †Average subgroup-specific characteristics based on person-year files. ‡Parent education, family structure, maternal fertility history and parenting style. §All family background characteristics, eighth-grade grades, dating experience, age at first sex, number of partners and contraceptive consistency. *Note:* na=not applicable.

Predicted Probabilities

The average white teenager in our sample had a 4% probability of having a birth in an average year (Table 4).* In comparison, the average black teenager had a 9% probability, the average U.S.-born Hispanic teenager an 8% probability and the average foreign-born Hispanic teenager a 12% probability.

If black teenagers in our sample had the same average family background characteristics (parent education, family structure, parenting style and proportion of mothers who gave birth as teenagers) as whites, blacks' estimated probability of having a teenage birth would decrease by 31%, to 6%. For U.S.-born and foreign-born Hispanics, however, the probability of a teenage birth did not change significantly when estimated using the family characteristics for whites. The probability of having a teenage birth did not change significantly for blacks or Hispanics when estimated on the basis of white respondents' grades and baseline dating experience, age at first sex, or number of sexual partners and contraceptive consistency. When the average characteristics for all variables significant in model 5 of the multivariate analysis were replaced with the average white characteristics for these measures, the probability of experiencing a teenage birth decreased 40% for black respondents (from 9% to 5%) and 35% for U.S.-born Hispanics (from 8% to 5%). The estimated change in probabilities for foreign-born Hispanics was not significant in any model, including ones that did not change reports of dating or family structure. (Dating was less common, and family structure more stable, for foreign-born Hispanics than for whites.) This was partly because of the small sample size for this group.

*The estimate of 4% for a white female with average sample characteristics is lower than the 17% of white females who had a birth prior to age 20 because the predicted probabilities are based on a single year of data, while the data in Table 1 are aggregated across the years between inclusion in the sample (at age 12–16) and age 20.

Subgroup Results

For whites, having a parent with less than a high school degree (rather than a parent who had completed high school) was associated with more than twice the odds of a teenage birth (Table 5). This association was significantly higher than the (nonsignificant) associations for blacks and Hispanics. Among black females, having an authoritarian parent (rather than an authoritative one) was associated with a 47% reduction in the odds of a teenage birth, while among whites, having an uninvolved parent was linked with a 68% increase in these odds. The associations between these parenting styles and teenage childbearing were significantly different for whites and blacks.

Among whites and blacks, the higher a teenager's grades in eighth grade, the lower her odds of a teenage birth, but this was not true among Hispanics. Any dating at baseline was associated with increased odds of a teenage birth for whites, but not for blacks and Hispanics, although the odds ratios were not significantly different by race and ethnicity.

Increasing age at first sex was associated with decreasing odds of a teenage birth for all racial and ethnic groups. However, among Hispanics only, having a partner who was of a different race or ethnicity was associated with 56% reduced odds of a teenage birth (and this odds ratio was significantly different than that for whites or blacks). Finally, number of sexual partners in the last year was negatively associated with the odds of a teenage birth for both blacks and Hispanics, although only the difference between Hispanics and whites was statistically significant.

DISCUSSION

In this study, we have attempted to add to the understanding of racial, ethnic and nativity differences in teenage childbearing. As in national estimates,[2] we found that whites in our sample had the lowest incidence of teenage births, and foreign-born Hispanics had the highest incidence. Our findings highlight dramatic differences across groups in family, individual and relationship contexts, including disparities in sexual risk-taking behaviors—and most of these types of characteristics were associated with the transition to a teenage birth. Our multivariate results suggest that differences in the context of adolescence help to account for racial, ethnic and nativity differences in teenage childbearing; translating these results into predicted probabilities helps us see by how much. If everyone in our sample had the average characteristics of whites, the probability of a teenage birth in an average year would drop to 5% for both blacks and U.S.-born Hispanics, much closer to the 4% probability among whites.

Although controlling for a host of contextual factors weakened the association between race and ethnicity and teenage childbearing, blacks and foreign-born Hispanics continued to have significantly higher odds than whites. These remaining associations likely reflect our inability to fully capture socioeconomic differences between groups in family, school and neighborhood characteristics, which may be strongly associated with the risk of a teenage

birth. Additionally, some evidence suggests that teenage childbearing may be more normative among black and Hispanic teenagers than among whites, but this characteristic could not be captured in this study.[5,13,14]

Family Background

Most of the explained racial and ethnic differences in teenage childbearing in these analyses were due to group differences in family background characteristics. As hypothesized, lower parental education, living in a family that did not include two biological or adoptive parents, and having a mother who had experienced a teenage birth were all associated with increased odds of teenage childbearing. The disproportionate disadvantage of blacks and U.S.-born Hispanics across these measures helps account for their higher teenage birthrates relative to whites. In fact, if black teenagers had the family context of white adolescents, they would have a significantly reduced probability of a teenage birth. For foreign-born Hispanic teenagers, the greater risk of teenage childbearing associated with lower levels of parental education and the large proportion of adolescents who were children of teenage mothers were counterbalanced, in part, by the reduced risk of a teenage birth for the large proportion who lived with two biological or adoptive parents. Notably, while higher parental education was associated with reduced odds of a teenage birth for all racial and ethnic groups, having a parent with less than a high school education was not associated with increased odds for blacks or Hispanics, perhaps because lower education levels were more prevalent (and thus potentially more normative) for these populations.

As hypothesized, uninvolved parenting was positively associated with teenage childbearing for whites, supporting previous research.[17] The negative association between authoritarian parenting and teenage childbearing for blacks, while counter to our hypothesis, is in the same direction as was found in a previous study, which suggests that authoritarian parenting may be associated with fewer risky behaviors for racial and ethnic minorities, particularly among blacks.[18]

Individual Characteristics

Only two characteristics were associated with teenage childbearing in this domain in the final model: Higher self-reported grades in school were associated with lower odds of a teenage birth (for whites, blacks and the full sample), and dating was associated with increased odds (for whites and the full sample). The inclusion of these variables removed the significance of the association between U.S.-born Hispanic ethnicity and teenage parenthood. The comparatively low grades reported by blacks and Hispanics (both U.S.-born and foreign-born) potentially help explain their higher teenage birthrates. In contrast, whites were more likely than any other group to report having dated. Thus, if blacks and Hispanics had the dating behaviors of whites, their risk of a teenage birth might increase. Interestingly, black teenagers were among the least likely to be dating, but they also reported the earliest timing of first sex, which may reflect differences by race and ethnicity in how dating and romantic relationships are defined.[25,33] Although there were dramatic differences in other individual characteristics—such as higher substance use among whites and U.S.-born Hispanics, lower delinquency among foreign-born Hispanics, and an earlier age at menarche among blacks and Hispanics—these were not associated with having a teenage birth.

Relationship Context and Sexual Behavior

We also found racial, ethnic and nativity differences in the characteristics of teenagers' sexual relationships, which were, in turn, associated with teenage childbearing. As hypothesized, older age at first sex and more consistent contraceptive use were associated with decreased odds of a teenage birth for the full sample and each racial and ethnic

TABLE 5. Odds ratios from discrete-time logistic regression analyses predicting a first teenage birth, by teenagers' characteristics, according to race and ethnicity

Characteristic	White (N=6,068)	Black (N=2,935)	Hispanic† (N=2,353)
DEMOGRAPHIC CHARACTERISTICS			
Age	1.36***	1.37***	1.35***
Foreign-born	na	na	1.37
FAMILY BACKGROUND			
Parent education			
<high school	2.42***	1.08‡	0.92‡
High school (ref)	1.00	1.00	1.00
Some college	0.88	0.70	0.48*
≥college	0.57*	0.38*	0.52
Two biological/adoptive parents	0.71*	0.75	1.03
Mother had a teenage birth	1.57*	1.56*	1.57
Parenting style			
Authoritative (ref)	1.00	1.00	1.00
Authoritarian	1.14	0.53*,‡	0.77
Permissive	0.79	0.74	0.74
Uninvolved	1.68*	0.80‡	0.86
INDIVIDUAL, PEER AND DATING CHARACTERISTICS			
Eighth-grade grades	0.88***	0.91*	1.01‡
Delinquency index	0.91	1.00	1.07
Substance use index	1.11	1.04	0.95
Negative peer characteristics	1.05	1.00	1.08
Age at menarche	1.03	1.12	1.10
Any dating in year before baseline	1.59*	1.03	1.34
FIRST SEXUAL RELATIONSHIP			
Age at first sex	0.74***	0.77***	0.68***
Steady dating, engaged, cohabiting or married at first sex	1.14	1.71*	1.02
Partner age difference	1.04	1.00	0.97
Partner of different race/ethnicity	1.21	1.29	0.44*,‡,§
Contraceptive use at first sex	1.23	0.75	0.86
SEXUAL EXPERIENCE AND CONTRACEPTIVE USE††			
No. of partners in last year	0.94	0.88*	0.81***,‡
Effectiveness of contraceptive method at last sex	1.05	1.00	0.99
Contraceptive consistency	0.24***	0.38***	0.35**
F statistic	*15.82****	*6.55****	*5.91****
df	*23*	*23*	*24*

*p<.05. **p<.01. ***p<.001. †U.S.- and foreign-born Hispanics. ‡Different from the odds ratio for whites at p<.05. §Different from the odds ratio for blacks at p<.05. ††Measures are time-varying. *Notes:* na=not applicable.

group. Blacks were younger than whites and foreign-born Hispanics at first sex in our sample, and Hispanics (particularly those who were foreign-born) were less likely than others to use contraceptives at first sex or to use them consistently, thus helping to account for their higher teenage birthrates. Notably, after we controlled for contraceptive consistency, method effectiveness was not associated with the risk of a teenage birth. This likely reflects that the success of the methods most commonly used by teenagers (condoms and pills)[1] depends heavily on correct and consistent use. Therefore, it is important to transition teenagers to long-acting methods with relatively low failure rates, such as implants or injectables.[41]

For Hispanics only, having a first sexual partner of a different race or ethnicity was associated with reduced odds of having a teenage birth. U.S.-born Hispanics were much more likely than foreign-born Hispanics to report interracial relationships, and the majority of these relationships were with white partners, who have a comparatively low risk of teenage childbearing.[2] Contrary to our hypothesis, number of sexual partners was negatively associated with teenage childbearing for blacks and Hispanics, perhaps reflecting increased condom use in short-term, casual relationships.

Differences Among Hispanics

Foreign-born Hispanic adolescents in our sample differed dramatically from U.S.-born Hispanics. They reported the highest incidence of teenage births, yet exhibited a combination of potentially protective characteristics (such as living with two biological or adoptive parents and initiating sex at an older age) and potentially risky characteristics (such as having less educated parents and low contraceptive use and consistency). Compared with Hispanics born in the United States, foreign-born Hispanics were more likely to report that their parents had received less than a high school education (reflecting lower levels of schooling in Latin America than in the United States[43]), and higher proportions had mothers who gave birth as teenagers (reflecting the historically high overall fertility rates among young women in Latin America[13]). While foreign-born Hispanics initiated sex at a later age than U.S.-born Hispanics and were more likely to grow up with two biological parents, they were also much less likely to use contraceptives. These findings suggest that prevention efforts may need to be targeted to match the diversity of experiences within the Hispanic community.

Limitations

This study has several limitations, primarily related to the data. First, our sample of foreign-born Hispanics is relatively small. In part, this is because the NLSY was based on individuals who were aged 12–16 in 1996, thus excluding Hispanics who entered the United States in their later adolescent years. Second, we have sexual partner measures only for the teenagers' first partner, which limits our ability to generalize the link between partner characteristics and teenage parenthood. Third, the survey's assessment of parenting style relies on two measures of overall parental supportiveness and permissiveness; relatively few adolescents reported having strict parents, and the proportion reporting permissive parents was higher than in other research.[44] We suspect some adolescents may have classified their authoritarian parents as permissive. Finally, while event history approaches take into account the relative timing of covariates and outcomes, we did not control for endogeneity and thus cannot interpret our associations as causal. However, these limitations are outweighed by detailed information on critical predictors of teenage childbearing in multiple domains and analyses that demonstrate how racial and ethnic differences in family, individual and relationship characteristics may help explain differences in the probability of a teenage birth.

Implications

Relatively early ages at first sex and relatively low levels of contraceptive use and consistency suggest the need for effective programs to help improve reproductive health outcomes across populations. Our research points to the need to take into account cultural differences within teenage populations. Rigorously evaluated evidence-based programs have shown impacts on sexual behaviors and contraceptive use for a variety of racial and ethnic groups; these programs are being scaled up nationally to target young people at risk of early pregnancy.[45] Pregnancy prevention programs and family planning clinics should focus on recruiting high-risk and difficult-to-reach populations. This includes outreach to foreign-born Hispanics, especially those who may have difficulty obtaining services because of language barriers or concerns about cost or the confidentiality of services, as well as addressing potential pressures that Hispanic females may experience from their family and community to not be prepared if they do have sex.[46]

We found strong negative associations between educational attainment and performance and teenage childbearing. If future research can establish a causal link between education and teenage pregnancy, then investments in education could be an effective prevention approach. These findings are supported by some youth development approaches to teenage pregnancy prevention, which focus on educational engagement, career goals or volunteer service-learning, and have been effective at pregnancy prevention.[47]

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