

# Association Between Adolescent Pregnancy And a Family History of Teenage Births

By Patricia L. East,  
Barbara T. Reyes  
and Emily J. Horn

Patricia L. East is research scientist, and Barbara T. Reyes and Emily J. Horn are research associates—all in the Department of Pediatrics, School of Medicine, University of California, San Diego.

**CONTEXT:** *The extent to which young women's risk of adolescent pregnancy is associated with having a mother who was a teenage parent, a sister who was a teenage parent or both is not known.*

**METHODS:** *A sample of 127 Latina and black adolescent females completed in-depth surveys at three time points between 1994 and 2000. Logistic regression analyses were used to examine whether socioeconomic factors, mothers' parenting characteristics and certain sibling relationship qualities explain the association between a family history of teenage births and young women's risk of pregnancy.*

**RESULTS:** *Compared with young women with no family history of teenage births, young women whose sister had had a teenage birth and those whose sister and mother both had had teenage births were significantly more likely to experience a teenage pregnancy (odds ratios, 4.8 and 5.1, respectively). Young women who had only a sister who had had a teenage birth had greater odds of pregnancy than young women who had only a mother who had had a teenage birth (4.5). Having both a mother and a sister who had had teenage births was independently associated with an elevated risk of pregnancy (3.7), even after controlling for socioeconomic and mothers' parenting characteristics. Frequent companionship with an older sister was associated with increased odds of teenage pregnancy (4.5); frequent conflict with an older sister who had had a teenage birth was marginally associated with decreased odds of the outcome (0.3).*

**CONCLUSION:** *Pregnancy prevention interventions targeting young women according to maternal and sibling teenage birth histories may be effective.*

*Perspectives on Sexual and Reproductive Health, 2007, 39(2):108–115, doi: 10.1363/3910807*

Considerable evidence documents that sisters of childbearing teenagers have disproportionately high teenage pregnancy rates and birthrates.<sup>1–6</sup> In one study, young women whose sisters had had a teenage birth had teenage childbearing rates more than twice those of same-age females within a matched city census tract and up to five times the overall rate for their state.<sup>1</sup> Other studies have shown daughters of teenage mothers to be significantly more likely than young women whose mothers delayed parenting until adulthood to experience a teenage birth.<sup>7–14</sup> For example, according to two studies that used nationally representative samples (one in the United States and one in Great Britain), the teenage birthrate of daughters of teenage mothers was more than twice that of daughters of women who were 20 or older at first birth.<sup>12,13</sup>

Despite the strong evidence for these trends, the incremental risk of adolescent pregnancy among young women who have both a sister and a mother who had teenage births is not known. Such young women are more likely exposed to norms for early parenthood than are women with either a mother or a sister who had teenage births. However, a mother's experience may be less influential than a sister's because the mother's early childbearing may be perceived as a phenomenon of her generation or of a particular time period. In addition,

a sister's teenage birth is more likely than a mother's to negatively and directly affect adolescents' day-to-day lives, by causing increased family strain, tension and disruption.<sup>15,16</sup> Clarifying the characteristics of family history that are associated with young women's likelihood of pregnancy is important because adolescent childbearing is associated with numerous problematic outcomes, including chronic socioeconomic disadvantage, lower educational attainment, marital instability and children's behavioral problems.<sup>17–19</sup>

Socialization and social control theories of the intergenerational transmission of early childbearing contend that children born to teenage mothers are at risk of early pregnancy because of their mothers' marital instability and reduced parenting ability, as well as because of the poorer socioeconomic environment in which young mothers raise their children.<sup>20</sup> Indeed, a disadvantaged home environment, being a single parent and mothers' limited education partially explain the association between mothers' and daughters' young ages at first birth.<sup>8,10,12,14</sup> Young mothers' lack of emphasis on their children's schooling also contributes to a daughter's greater likelihood of teenage childbearing.<sup>13</sup> Although several studies have examined whether a lenient parenting style or limited parenting capacities of teenage mothers contribute to their daughters' propensity for

early births, none has found a relationship.<sup>7,8,12,14</sup> Moreover, despite speculation that young mothers' accepting attitudes about teenage parenting might mediate the link between mothers' and daughters' early childbearing,<sup>10,12,20</sup> no study has specifically tested this possibility.

Several processes that might mediate the link between a sister's teenage birth and a teenager's higher pregnancy risk have been suggested. For example, a teenage sister's childbearing is associated with mothers' reduced ability to monitor their children and increased acceptance of teenage parenting.<sup>6,21</sup> Both of these dynamics have been linked with youths' propensity to engage in pregnancy risk behaviors and may contribute to the high teenage pregnancy rates among the sisters of parenting teenagers.<sup>22,23</sup> In addition, certain qualities of the relationship between a young woman and her teenage parenting sister might elevate her risk of pregnancy.

Social learning theory asserts that an individual's capacity to serve as a model of behavior is enhanced when that person interacts frequently with another.<sup>24</sup> A youth's ability to change his or her sibling's behavior is strongest when the two are close and spend a lot of time together.<sup>25</sup> Indeed, sibling modeling effects on youths' sexual attitudes and sexual behavior are most prevalent when siblings interact frequently and have a warm and amiable relationship.<sup>26,27</sup> However, in two studies, rivalry between a young woman and her pregnant or parenting older sister was positively related to whether the younger sister had engaged in early sexual activity.<sup>28,29</sup> This suggests that a younger sister may act out through her sexual behavior (or become pregnant) to rival or antagonize her older sister. Alternatively, she may vie for parental attention—attention lost perhaps as a result of her older sister's childbearing—through sexual behavior, pregnancy or parenthood.

## THIS STUDY

We used a sample of adolescent females—many of whom had a family history of teenage births and all of whom were studied prospectively from early adolescence (ages 12–14) to late adolescence (ages 18–20)—to address the following questions: What is the risk of early pregnancy among young women who have both a sister and a mother who had a teenage birth, relative to the risk among young women who have neither? Is having a mother who had a teenage birth associated with a greater risk of pregnancy than having a sister who had a teenage birth? Is having a sister and a mother who had a teenage birth associated with a greater risk of pregnancy than having only one or the other? Do family socioeconomic factors or mothers' parenting qualities and attitudes explain the link between a family history of teenage births and youths' greater risk of adolescent pregnancy? Does the level of young women's companionship, warmth and closeness, rivalry or conflict with an older sister or with a sister who had a teenage birth increase their likelihood of early pregnancy?

In addressing these questions, we seek to contribute to the literature in three important ways. First, unlike earlier studies, ours examines the risk of pregnancy associated both with having a sister and with having a mother who had a teenage birth. Second, whereas previous studies compared adolescent women who had a teenage childbearing sister with the general population of adolescent women, many of whom did not have an older sister or even a sibling,<sup>1,5</sup> we restricted our sample to those who had an older, coresidential, biologically related teenage sister. Thus, our study can provide a more accurate estimate of the pregnancy risk associated with having a sister who had a teenage birth versus having a sister who did not. Third, we examined associations between socioeconomic and parenting risk factors and youths' risk of pregnancy under scenarios reflecting different family histories of teenage births (that is, when only the mother, only a sister or both had had a teenage birth). Such models can reveal how socioeconomic and parenting characteristics might operate in explaining the occurrence of early pregnancy within a family.

## METHODS

### Sample and Data Collection

The overall study was designed to examine the concordance of pregnancy and pregnancy risk behaviors among children within a family. Families were eligible to participate if they contained at least one older teenage daughter (aged 15–18) and at least one biological younger sibling (aged 12–16) who had never been involved in a pregnancy at study enrollment. Only Mexican American and black families were enrolled, because those groups have disproportionately high rates of teenage pregnancy and births.<sup>30,31</sup>

Between 1994 and 1995, we recruited families by first identifying eligible adolescent females—that is, the older teenage sister. These adolescents were recruited from local high schools (29%), community clinics (28%) and Planned Parenthood clinics (19%), and by asking enrolled participants for recommendations of other potential participants (24%). Ninety percent of all eligible individuals invited to participate did so. Overall, 183 families were enrolled in the study.

The focus of the current analyses is on the younger sisters; 146 younger brothers were excluded because very few reported fathering a child before age 19. There were 172 younger sisters enrolled in the study (average age at enrollment, 13.7 years; standard deviation, 1.7); 149 of these young women were followed up two years later (average age, 15.2; standard deviation, 1.7), and 127 approximately three years after that (average age, 18.6; standard deviation, 1.7). The follow-up rates were 86–87% between consecutive assessments and 74% from baseline to the five-year follow-up. The younger sisters who participated at the third time point did not differ significantly from those lost to follow-up in terms of key background characteristics (i.e., age, race and ethnicity,

**TABLE 1. Percentage distribution of teenage women in a study of the association between early pregnancy and a family history of teenage births, by family history, 1994–2000**

Family member who had a teenage birth	% (N=127)
Neither mother nor sister	26
Only sister	21
Only mother	21
Both mother and sister	32
Total	100

family income or family's receipt of government supplemental financial aid) or family history of teenage child-bearing.

The 127 younger sisters who were assessed at the last time point form the sample for the current analyses. Sixty-four percent were from low-income families, and 62% were receiving some form of government financial assistance at the time of enrollment. By design, all youth were living with their older sister and their mother at the time of enrollment.

At each time point, two bilingual (English and Spanish) female research assistants visited participating families in their homes. All adolescent women completed a short interview and a self-administered questionnaire in a room away from the rest of the household to provide for as much privacy as possible. Older sisters were asked additional questions about their pregnancy history. Also, researchers gathered information on whether any other teenage sister living in the household had given birth. Furthermore, young women's mothers completed questionnaires and interviews about their pregnancy history, parenting style and attitudes, and individual and family socioeconomic characteristics; mothers' average age at study enrollment was 40.

Home visits lasted about one hour; participants were paid \$10 each and were assured of the confidentiality and anonymity of their responses. All youth completed the interview and questionnaire in English. Fifty-seven percent of mothers completed the interview or questionnaire in Spanish; the responses of mothers who answered in Spanish did not differ significantly from those of mothers who answered in English. This study's procedures were approved by the institutional review board of the Human Research Protections Program at the authors' university.

### Measures

Most measures were drawn from the baseline assessment. Sibling relationship measures were taken from the five-year follow-up because we wanted to examine the relationship dynamics young women shared with a sister who was a teenage parent, if one was present, and this was not known until that visit. Also, young women's pregnancy status was taken from the five-year follow-up.

•**Family socioeconomic status.** In their interviews, mothers provided information about their total annual family income and their highest level of completed education.

Response options for the former were grouped in \$5,000 intervals starting at "less than \$10,000" and ending at "more than \$45,000"; response options for the latter were grouped into categories ranging from "sixth grade or less" to "graduate degree."

•**Mothers' parenting.** Mothers were asked how strict they were in general and, specifically, about their children's curfew, where and when their children could go out, and their children's getting their homework done; response options ranged from 1 (not strict at all) to 5 (very strict). The four responses were averaged and reversed so that a high score reflects mothers' lenient or permissive parenting. Also, mothers responded to five questions about the degree to which they approved or disapproved of teenage sex and teenage parenting: For example, mothers were asked whether they approved of "teenagers having children," and whether "teenagers should wait until they are older to have sex." Response options ranged from 1 (strongly approve) to 5 (strongly disapprove); scores were averaged and reversed so that high scores reflect acceptance of early sex and early parenting. Furthermore, mothers were asked four questions about how important it was to them for their children to pursue educational goals (e.g., to graduate from high school or go to college); response options ranged from 1 (not important at all) to 5 (very important). Scores were averaged and reversed so that a high score reflects low value of education. All scores within each domain had high internal consistency reliability (Cronbach alphas greater than 0.74). Finally, mothers indicated whether they were currently single (yes or no).

•**Sibling relationship.** Participants completed the Sibling Relationship Questionnaire,<sup>32</sup> which yields scores for conflict (six items—e.g., "How much do you and your sister disagree and fight with each other?"); rivalry (six items—e.g., "My sister almost always gets treated better by our mother"); companionship (three items—e.g., "How much do you and this sister go places and do things together?"); and warmth and closeness (18 items—e.g., "How much do you and your sister care about each other?"). Items were coded such that high scores reflect frequent conflict, a high degree of rivalry, frequent companionship and a high degree of warmth and closeness. The internal consistency of all scales exceeded 0.75. If participants had a sister who was a teenage parent, they were instructed to complete the questionnaire for their relationship with that sister; if participants had more than one older sister who had had a teenage birth, they were instructed to answer in regard to the sister who had been pregnant first.

•**Pregnancy.** Respondents answered several questions about their sexual and pregnancy histories at all three study time points. If respondents indicated that they had had sexual intercourse, they were asked whether they had ever been pregnant. At the five-year follow-up, respondents indicated whether they had ever experienced a pregnancy at age 18 or younger.

## Analysis

We conducted bivariate logistic regression analyses to determine the likelihood of pregnancy associated with young women's family socioeconomic status, mothers' parenting characteristics and sibling relationship qualities. Then, we conducted multivariate logistic regression analyses to determine the likelihood of pregnancy associated with a family history of teenage births. Because we were interested in the risk of pregnancy given particular combinations of family history variables, we computed three separate models specifying three unique reference categories: having neither a mother nor a sister who had had a teenage birth; having both a mother and a sister who had had a teenage birth; and having only a mother who had had a teenage birth. All equations controlled for youths' age and race and ethnicity, because age was strongly correlated with pregnancy, and race and ethnicity were significantly associated with a family history of teenage births.

To assess the mediating effects of socioeconomic characteristics and mothers' parenting characteristics on the association between a family history of teenage births and a young woman's early pregnancy risk, we constructed stepwise regression models. First, we controlled for youths' age, and race and ethnicity. Next, we added mothers' educational level and family income. Finally, we added the four mothers' parenting scores. If the association between a family history of teenage births and the likelihood of pregnancy diminishes in the presence of these mediators, then we can conclude that these factors account for or contribute to the association.<sup>7,8,12,20</sup>

We conducted additional analyses to examine whether particular characteristics of the relationship with an older sister are associated with youths' likelihood of pregnancy. These analyses included the four sibling relationship measures, the measure of whether the older sister was a teenage parent and a term for their interaction. The interaction term tests whether the combined association of sister's childbearing status and frequent sibling companionship, for example, with youths' pregnancy status is greater than the association between pregnancy and each predictor alone. These analyses controlled for youths' age, race and ethnicity, and whether the mother had been a teenage parent.

## RESULTS

### Descriptive and Bivariate Analyses

Fifty-four percent of the older sisters of the 127 young women who were the focus of this study reported having their first birth at age 18 or younger; among these sisters, the average age at childbearing was 16 (standard deviation, 1.4; range, 13.6–18.9 years). Similarly, 54% of young women's mothers reported having their first child at age 18 or younger; among these mothers, the average age at first birth was 17 (standard deviation, 1.1; range, 14.4–18.7 years). Among the young women, 26% had neither a mother nor a sister who had had a teenage birth, 21%

**TABLE 2. Selected measures of family socioeconomic status, mother's parenting and sibling relationships, and odds ratios from bivariate analyses assessing their associations with the likelihood of early pregnancy**

Measure	Mean or %	Odds ratio
<b>Socioeconomic</b>		
Family income (range, ≤\$10,000 to ≥\$45,000)	\$16,350	0.88
Mothers' education (range, ≤6th grade to graduate degree)	10th grade	1.05
<b>Mother's parenting</b>		
Single (%)	57	3.78**
Lax (range, 1–5)	2.62	1.79**
Approval of teenage sex/parenting (range, 1–5)	1.89	1.53*
Low value of education (range, 1–5)	1.36	2.65*
<b>Relationship with older sister</b>		
Companionship (range, 1–5)	2.52	2.53*
Conflict (range, 1–5)	2.65	1.13
Rivalry (range, 1–5)	3.25	2.14*
Warmth/closeness (range, 1–5)	3.15	1.01

\*p<.05. \*\*p<.01. Notes: Unless otherwise noted, data in the first column are means. A high score indicates mother's lax parenting, mother's approval of teenage sex/parenting, mother's low value of education, frequent sibling conflict, high rivalry, frequent companionship or high sibling warmth and closeness.

had only a sister who had had a teenage birth, 21% had only a mother who had had a teenage birth, and 32% had both (Table 1).

In bivariate analyses by race and ethnicity, a significantly greater proportion of black youth than of Latinas had a sister who had had a teenage birth (68% vs. 47%; p<.05—not shown); race and ethnicity was not associated with having a mother who had had a teenage birth (65% for blacks and 50% for Latinas). A greater proportion of black youth than of Latinas had both a sister and a mother who had had teenage births (51% vs. 26%; p<.01).

Of the young women who completed the study at ages 18–20, 36% had experienced a pregnancy before age 19. Among these, the mean age at pregnancy was 16 years (standard deviation, 1.6; range 13.0–18.5 years). Thirty-three percent of Latinas and 44% of blacks reported a pregnancy; this difference was not significant. Eighteen percent of young women who had no family history of teenage births experienced a teenage pregnancy; the proportions of young women who experienced teenage pregnancy among those who had either a mother or a sister who had had a teenage birth or both are 23%, 44% and 53%, respectively. The difference in teenage pregnancy by family history of teenage births was statistically significant (p<.01).

In additional bivariate analysis (Table 2), all four maternal parenting measures—being single, lax parenting, approval of teenage sex and parenting, and low value of education—were significantly associated with young women's increased risk of teenage pregnancy (odds ratios, 1.5–3.8). Thus, for each one point increase in lax parenting, for example, a young woman's odds of early pregnancy increase 1.8 times. Two of the four sibling relationship measures—companionship and rivalry—were

**TABLE 3. Odds ratios (and 95% confidence intervals) from logistic regression analyses examining the associations between family history of teenage births and young women's likelihood of experiencing an early pregnancy**

Model	Odds ratio
<b>Model 1</b>	
Neither mother nor sister had teenage birth (ref)	1.00
Only mother had teenage birth	1.12 (0.3–4.4)
Only sister had teenage birth	4.79 (1.3–17.2)*
Both had teenage birth	5.08 (1.6–16.6)**
<b>Model 2</b>	
Both mother and sister had teenage birth (ref)	1.00
Only mother had teenage birth	0.20 (0.1–0.8)*
Only sister had teenage birth	0.95 (0.3–3.0)
<b>Model 3</b>	
Only mother had teenage birth (ref)	1.00
Only sister had teenage birth	4.52 (1.0–21.3)*
Both had teenage birth	na

\*p<.05. \*\*p<.01. Notes: Results are adjusted for age, race and ethnicity. ref=reference group. na=not applicable.

positively associated with teenage pregnancy (2.5 and 2.1, respectively).

**Multivariate Analyses**

•*Family history of teenage births and adolescent pregnancy.*

In the first logistic regression model (Table 3), young women who had a sister who had had a teenage birth and those who had both a sister and a mother who had had a teenage birth had higher odds of experiencing a pregnancy than young women who had no family history of teenage births (odds ratios, 4.8 and 5.1, respectively). Young women who had only a mother who had had a teenage birth did not differ significantly in terms of pregnancy risk from those who had no family history of teenage births (1.1). This lack of association between teenage pregnancy and having a mother who had been a teenage parent contradicts a well-established link reported in previous research.<sup>9–13</sup> Thus, we conducted

separate analyses to clarify whether the finding pertained only to Latinas or only to blacks; we found a marginally significant association between having a mother who had had a teenage birth and early pregnancy for blacks (odds ratio, 7.0; p<.07), but no association for Latinas.

In the second model, compared with young women whose mother and sister both had had teenage births, those who had only a sister who had had a teenage birth were not at greater risk of early pregnancy; however, young women who had only a mother who had had a teenage birth had a significantly reduced risk of pregnancy (odds ratio, 0.2). In the third model, young women who had a sister who had had a teenage birth had more than four times the odds of experiencing a teenage pregnancy of those who had only a mother who had been a teenage parent (4.5).

•*Mediating effects of socioeconomic and mothers' parenting characteristics.*

The first model of Table 4 repeats our findings of the associations between pregnancy and a family history of teenage births shown in Table 3. When variables for family income and mother's educational level were included, in the second model, the magnitude of the associations between having a sister who had had a teenage birth and adolescent pregnancy, and between having both a mother and a sister who had had a teenage birth and adolescent pregnancy, were each reduced (odds ratios, both 4.4) but remained significant. When mothers' parenting attitudes and behaviors were added in the final model, having both a mother and a sister who had had a teenage birth remained associated with teenage pregnancy (3.7); however, having only a sister who had had a teenage birth became nonsignificant. In addition, mothers' lax parenting was associated with teenage pregnancy (1.9).

•*Sibling relationship characteristics and adolescent pregnancy.*

Of the four sibling relationship measures, only frequent companionship with an older sister was significantly associated with the risk of teenage pregnancy (odds ratio, 4.5—Table 5); frequent rivalry with an older sister was marginally associated with pregnancy risk (2.9). Having a sister who had had a teenage birth was associated with significantly elevated odds of pregnancy (5.0–7.4); the odds varied by which individual sibling relationship characteristic was included in the equation. Two of the interaction terms were marginally significant: Frequent companionship with a sister who had had a teenage birth was associated with greater odds of pregnancy (5.2), and frequent conflict with a sister who had had a teenage birth was associated with decreased odds of pregnancy (0.3).\*

\*Having a sister who had had a teenage birth was significantly correlated with low sibling conflict and low companionship (r=–.22 and r=–.18, respectively). Thus, young women generally had less conflict and spent less time with a sister who was a teenage parent than with other sisters. Warmth and closeness and rivalry were not associated with having a sister who was a teenage parent.

**TABLE 4. Odds ratios (and 95% confidence intervals) from logistic regression analyses examining the associations between early pregnancy and selected characteristics**

Characteristic	Model 1	Model 2	Model 3
<b>Family member who had teenage birth†</b>			
Only mother	1.12 (0.3–4.4)	1.03 (0.3–4.1)	0.82 (0.2–3.7)
Only sister	4.79 (1.3–17.2)*	4.44 (1.2–16.4)*	2.56 (0.6–10.6)
Both mother and sister	5.08 (1.6–16.6)**	4.42 (1.2–15.8)*	3.65 (0.9–14.5)*
<b>Socioeconomic</b>			
Age	1.93 (1.4–2.6)***	2.00 (1.4–2.7)***	1.84 (1.3–2.6)***
Latina	0.81 (0.3–2.0)	1.14 (0.4–3.3)	1.01 (0.3–3.1)
Family income	na	0.80 (0.6–1.1)	0.78 (0.5–1.2)
Mother's educational level	na	1.17 (0.9–1.5)	1.20 (1.0–1.5)
<b>Mother's parenting</b>			
Single	na	na	2.06 (0.7–6.3)
Lax	na	na	1.91 (1.1–3.3)*
Approval of teenage sex/parenting	na	na	1.25 (0.7–2.2)
Low value of education	na	na	1.01 (0.4–2.5)

\*p<.05. \*\*p<.01. \*\*\*p<.001. †Reference category is neither mother nor sister. Note: na=not applicable.

## DISCUSSION

The risk of pregnancy among young women was more strongly associated with their sisters' teenage parenting status than with their mothers'. Having a sister who had had a teenage birth and having both a sister and a mother who had had a teenage birth each were associated with elevated risks of pregnancy; however, having only a mother who had had a teenage birth was not.

The lack of association between mothers' teenage parenting status and daughters' likelihood of early pregnancy was somewhat surprising and inconsistent with most previous research.<sup>9-12</sup> Many of the previous studies, however, had either predominantly black<sup>9,10,11,14</sup> or white samples,<sup>7,8,12,13</sup> whereas our study sample consisted of Latina and black women. When we conducted separate analyses by race and ethnicity, mothers' teenage birth status was marginally associated with early pregnancy among black youth, but not among Latinas. Latina mothers may more clearly communicate the hardships associated with early parenting in hopes of dissuading their daughters from becoming teenage parents. Alternatively, Latina adolescents may not always look to their mothers as role models for their own choices. More research is needed to corroborate this finding, which appears to depart from previously well established links for white and black mother-daughter pairs.

Our finding that having a sister who had had a teenage birth was associated with a greater risk of pregnancy than having a mother who had had a teenage birth suggests the strong impact that a sister's early birth has on young women. Family stress and tensions probably occur as family members try to cope with caring for an infant.<sup>15</sup> In addition, one study found that the mothers of pregnant teenagers monitored and communicated less with their other children after their teenage daughters gave birth.<sup>21</sup> That study also reported that mothers grew less strict with their other children over time. According to our results, mothers' lenient management of their children partially accounted for the association between sisters' teenage childbearing and young women's pregnancy risk. Thus, mothers' lax and inattentive parenting after a teenage daughter has had a child represents one pathway to younger sisters' elevated risk for early pregnancy. However, mothers' attitudes and diligent parenting behaviors may do little to ameliorate the effects on young women's risk of pregnancy of having both a sister and a mother who had had teenage births: Young women with such a family history had an increased risk of early pregnancy even after we controlled for socioeconomic background and mothers' parenting characteristics.

Frequent companionship with an older sister (regardless of her parenting status) was associated with young women's elevated risk of pregnancy. The odds of experiencing a pregnancy among young women who reported frequent companionship with an older sister who had had a teenage birth were similarly high, although the

**TABLE 5. Odds ratios (and 95% confidence intervals) from logistic regression analyses examining the associations between specific sibling relationship characteristics, older sisters' teenage parenting status and young women's likelihood of early pregnancy**

Predictor	Companionship	Conflict	Rivalry	Warmth/closeness
Relationship quality with older sister	4.54 (1.0–20.5)*	1.67 (0.7–4.0)	2.86 (0.9–9.0)†	1.87 (0.5–6.8)
Older sister had teenage birth‡	5.63 (2.1–15.1)***	4.97 (1.9–13.2)**	5.92 (2.2–15.8)***	7.37 (2.6–20.8)***
Interaction	5.20 (0.7–36.5)†	0.31 (0.1–1.1)†	1.56 (0.3–8.4)	2.35 (0.5–11.3)

\*p<.05. \*\*p<.01. \*\*\*p<.001. †p<.10. ‡Separate analyses were conducted, each including a separate sibling relationship characteristic. Notes: Results are adjusted for age, race and ethnicity, and mother's teenage parenting status.

association was only marginally significant. These findings are consistent with a social modeling perspective, which postulates that sibling socialization is greatest for siblings who spend large amounts of time together.<sup>24,25</sup> Indeed, several studies have reported that younger siblings are more likely to smoke or drink if they interact frequently with older siblings who do so.<sup>33,34</sup> A high degree of companionship with an older sister may increase a younger woman's risk of pregnancy because the older sister may be actively including her sister in her friendship network, which may contain older, sexually experienced adolescents.<sup>29,35</sup> In addition, greater companionship between sisters might reflect the younger sister's tendencies toward more mature and risky behaviors, which ultimately could lead to early pregnancy.

Frequent conflict with an older sister who had had a teenage birth was marginally associated with young women's reduced likelihood of pregnancy. Interestingly, having a sister who had had a teenage birth (as opposed to having a sister who had not had a teenage birth) was significantly correlated with low sibling conflict. Thus, low conflict may result from the younger sister's feeling sorry for or perhaps sympathizing with her older sister as she struggles to parent a small child. Low conflict may also reflect a lack of sibling involvement or interaction, again possibly resulting from the older sister's parenting obligations. In either case, the finding warrants further research.

### Study Limitations and Strengths

This study's limitations should be considered when interpreting its findings. Foremost was the small sample size, particularly in analyses examining youths by their sisters' and mothers' teenage parenting status. The small group sizes likely reduced the power of some analyses. In addition, the small numbers precluded us from fully exploring the various family history risks for Latinas and black females separately. Furthermore, the age of

\*At least one other study failed to find an association between having a mother who was a teenage parent and daughters' likelihood of pregnancy (source: Landry E et al., Teen pregnancy in New Orleans: factors that differentiate teens who deliver, abort, and successfully contracept, *Journal of Youth and Adolescence*, 1986, 15(3):259–274).

the data should be considered. Data were collected as early as 1994; teenage pregnancy rates have declined significantly since that time,<sup>31</sup> and this could have affected our results.

The sample consisted largely of Mexican American families; thus, our results likely reflect the dynamics and risk factors present within these families. Also, all study participants were female, and most were from relatively poor families. Although the nature of this sample limits the generalizability of study findings, we believe that the results are relevant to the youth represented here: nonwhite adolescent females who have a family history of teenage births. However, further research is needed among males and among more diverse adolescent populations.

In addition, we analyzed only whether an older sister had given birth as a teenager; we did not look at whether a sister had ever become pregnant, how many children she had had as a teenager or how many sisters within the family had had teenage births. All of these factors are important for younger sisters' pregnancy risk.<sup>1,6,36</sup> Also, we did not examine whether characteristics of the mother-daughter relationship were important for young women's pregnancy risk. The openness and closeness of daughters' relations with their mothers is important for adolescents' sexual risk-taking behavior, and may serve as a useful link between mothers' and daughters' teenage parenting status.<sup>37,38</sup> Moreover, we did not have information about how older sisters who had had a teenage birth viewed their early parenting. They may have wanted their younger sisters to avoid going through what they had experienced;<sup>16</sup> however, some older sisters (knowingly or unknowingly) may have encouraged their younger sisters to also have children. Such information would have helped reveal the dynamics associated with adolescents' repeating their older sisters' early parenting experiences.

Although our study had limitations, it also had several strengths. Mothers self-reported their age at first birth; thus, this information is likely to be more reliable and accurate than if provided by teenagers. Also, the study ascertained older sisters' age at pregnancy through a face-to-face interview and followed up all older sisters, so we were able to verify that they had had a teenage birth. Moreover, study participants were required to have at least one older teenage sister, so having an older sister who was a teenage parent was at least a possibility for all youth. A random sample that did not include this eligibility criterion would have yielded inaccurate estimates of the risk associated with having a sister who was a teenage parent.

### Program Implications

Overall, our results underscore the high risk of early pregnancy associated with having a family history of teenage parenting, particularly a sister who has had a teenage birth. These results may help clinic and pro-

gram personnel identify youth who are vulnerable to early pregnancy or to engaging in risky sexual behaviors. Prevention programs and interventions that target youth who have a family history of teenage parenting are sorely needed.<sup>39,40</sup>

Although a family history of early childbearing cannot be changed, interventions that help families cope with a teenage daughter's parenting and help mothers within such families remain connected to and involved in their younger daughter's lives seem worthwhile. The finding that maternal strictness during early adolescence is associated with younger sisters' decreased odds of early pregnancy suggests that parental counseling interventions that target mothers within families already affected by adolescent childbearing may be a useful approach. For example, efforts to help mothers set appropriate limits for their children's behavior and to more closely monitor their adolescent children's experiences with peers and away from home may be particularly beneficial.<sup>41,42</sup> Supporting the parenting efforts of mothers who have teenage childbearing daughters seems especially crucial, given that such mothers often spend large amounts of time caring for their daughter's child, which may distract them from carefully overseeing their other children.<sup>21</sup>

In addition, parenting older sisters could play an important role in pregnancy prevention efforts for younger women, although one would certainly not want to create poor relationships between sisters as a prevention mechanism. An educational program, for example, that helps older sisters recognize ways in which they can positively influence their younger sisters may be beneficial for all. Breaking the cycle of teenage parenting within families may be a constructive and useful approach toward adolescent pregnancy prevention.

### REFERENCES

1. Cox J, Emans SJ and Bithoney W, Sisters of teen mothers: increased risk for adolescent parenthood, *Journal of Adolescent and Pediatric Gynecology*, 1993, 6(1):138-142.
2. East PL and Felice ME, Pregnancy risk among the younger sisters of pregnant and childbearing adolescents, *Journal of Developmental and Behavioral Pediatrics*, 1992, 13(2):128-136.
3. East PL and Jacobson LJ, The younger siblings of teenage mothers: a follow-up of their pregnancy risk, *Developmental Psychology*, 2001, 37(2):254-264.
4. Friede A et al., Do the sisters of childbearing teenagers have increased rates of childbearing? *American Journal of Public Health*, 1986, 76(10):1221-1224.
5. Hogan D and Kitagawa E, The impact of social status, family structure, and neighborhood on the fertility of black adolescents, *American Journal of Sociology*, 1985, 90(4):825-855.
6. National Campaign to Prevent Teen Pregnancy, Science says: younger siblings of teen parents: an increased risk of teen pregnancy? 2004, <<http://www.teenpregnancy.org/works/pdf/ScienceSaysSiblings.pdf>>, accessed Mar. 16, 2007.
7. Bonell C et al., Influence of family type and parenting behaviors on teenage sexual behavior and conceptions, *Journal of Epidemiological Community Health*, 2006, 60(6):502-506.

8. Campa MI and Eckenrode JJ, Pathways to intergenerational adolescent childbearing in a high-risk sample, *Journal of Marriage and Family*, 2006, 68(3):558-572.
9. Furstenberg FF, Jr., Levine JA and Brooks-Gunn J, The children of teenage mothers: patterns of early childbearing in two generations, *Family Planning Perspectives*, 1990, 22(2):54-61.
10. Hardy JB et al., Like mother, like child: intergenerational patterns of age at first birth and associations with childhood and adolescent characteristics and adult outcomes in the second generation, *Developmental Psychology*, 1998, 34(6):1220-1232.
11. Horwitz SM et al., Intergenerational transmission of school-age parenthood, *Family Planning Perspectives*, 1991, 23(4):168-177.
12. Kahn JR and Anderson DE, Intergenerational patterns of teenage fertility, *Demography*, 1992, 29(1):39-57.
13. Manlove J, Early motherhood in an intergenerational perspective: the experiences of a British cohort, *Journal of Marriage and the Family*, 1997, 59(2):263-279.
14. Pogarsky G, Thornberry TP and Lizotte AJ, Developmental outcomes for children of young mothers, *Journal of Marriage and Family*, 2006, 68(3):332-344.
15. East PL, Impact of adolescent childbearing on families and younger siblings: effects that increase younger siblings' risk for early pregnancy, *Applied Developmental Science*, 1998, 2(2):62-74.
16. Furstenberg FF, Jr., Burdens and benefits: The impact of early childbearing on the family, *Journal of Social Issues*, 1980, 36(1):64-87.
17. Coley RL and Chase-Lansdale PL, Adolescent pregnancy and parenthood: recent evidence and future directions, *American Psychologist*, 1998, 53(2):152-166.
18. Jaffee S et al., Why are children born to teen mothers at risk for adverse outcomes in young adulthood? results from a 20-year longitudinal study, *Development and Psychopathology*, 2001, 13(3):377-397.
19. Kalil A and Kunz J, Teenage childbearing, marital status, and depressive symptoms in later life, *Child Development*, 2002, 73(6):1748-1760.
20. Barber JS, The intergenerational transmission of age at first birth among married and unmarried men and women, *Social Science Research*, 2001, 30(2):219-247.
21. East PL, The first teenage pregnancy in the family: does it affect mothers' parenting, attitudes, or mother-adolescent communication? *Journal of Marriage and the Family*, 1999, 61(2):306-319.
22. Kirby D, *Looking for Reasons Why: The Antecedents of Adolescent Sexual Risk-Taking, Pregnancy, and Childbearing*, Washington, DC: National Campaign to Prevent Teen Pregnancy, 1999.
23. Miller BC, *Families Matter: A Research Synthesis of Family Influences on Adolescent Pregnancy*, Washington, DC: National Campaign to Prevent Teen Pregnancy, 1998.
24. Bandura A, *Social Learning Theory*, Englewood Cliffs, NJ: Prentice Hall, 1977.
25. Noller P, Sibling relationships in adolescence: learning and growing together, *Personal Relationships*, 2005, 12(1):1-22.
26. Kowal AK and Blinn-Pike L, Sibling influences on adolescents' attitudes toward safe sex practices, *Family Relations*, 2004, 53(4):377-384.
27. Widmer ED, Influence of older siblings on initiation of sexual intercourse, *Journal of Marriage and the Family*, 1997, 59(4):928-938.
28. East PL, The younger sisters of childbearing adolescents: their attitudes, expectations and behaviors, *Child Development*, 1996, 67(2):267-282.
29. East PL and Shi CR, Pregnant and parenting adolescents and their younger sisters: the influence of relationship qualities for younger sister outcomes, *Journal of Developmental and Behavioral Pediatrics*, 1997, 18(2):84-90.
30. Martin JA et al., Births: final data for 2004, *National Vital Statistics Reports*, 2006, Vol. 55, No. 1.
31. Ventura SJ, Abma JC and Mosher WD, Estimated pregnancy rates for the United States, 1990-2000: an update, *National Vital Statistics Reports*, 2004, Vol. 52, No. 23.
32. Furman W and Buhrmester D, Children's perceptions of the qualities of sibling relationships, *Child Development*, 1985, 56(2):448-461.
33. Ary DV et al., The influences of parent, sibling and peer modeling and attitudes on adolescent use of alcohol, *International Journal of the Addictions*, 1993, 28(9):853-880.
34. Windle M, Parental, sibling, and peer influences on adolescent substance use and alcohol problems, *Applied Developmental Science*, 2004, 4(1):98-110.
35. Cox JE et al., Early parenthood for the sisters of adolescent mothers: a proposed conceptual model of decision making, *Journal of Adolescent and Pediatric Gynecology*, 1995, 8(2):188-194.
36. East PL and Kiernan EA, Risks among youths who have multiple sisters who were adolescent parents, *Family Planning Perspectives*, 2001, 33(2):75-80.
37. Kahlbaugh P et al., The affective nature of mother-daughter communication concerning sexuality and conflict, *Journal of Research on Adolescence*, 1997, 7(2):221-239.
38. Resnick MD et al., Protecting adolescents from harm: findings from the National Longitudinal Study on Adolescent Health, *Journal of the American Medical Association*, 1997, 278(10):823-832.
39. East PL, Breaking the cycle of teenage pregnancy: prevention opportunities focusing on the younger sisters of teen mothers, *Education and Urban Society*, 1998, 30(2):157-171.
40. Stevens-Simon C, Participation in a program that helps families with one teen pregnancy prevent others, *Journal of Pediatric and Adolescent Gynecology*, 2000, 13(1):167-169.
41. Meschke LL, Bartholomae S and Zentall SR, Adolescent sexuality and parent-adolescent processes: promoting healthy teen choices, *Journal of Adolescent Health*, 2002, 31(6):264-279.
42. Steinberg L and Duncan P, Work group IV: increasing the capacity of parents, families, and adults living with adolescents to improve adolescent health outcomes, *Journal of Adolescent Health*, 2002, 31(6):261-263.

#### Acknowledgments

This research was supported by grant R01-HD043221 from the National Institute of Child Health and Human Development and grant APR-000970 from the Office of Population Affairs, U.S. Department of Health and Human Services. The authors thank Leanne Jacobson for supervising the collection of data for this study and Jesse Brennan for his suggestions on data analysis.

**Author contact:** [peast@ucsd.edu](mailto:peast@ucsd.edu)