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Stress in Latino Families Following an Adolescent's Childbearing: Effects on Family Relationships and Siblings

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Abstract

This study examined how increased stress in Latino families following an adolescent's childbearing impacts family relationships and the adolescent's siblings. Participants were 243 Mexican American youth (mean age: 13.7 years; 62% girls), or 121 youth who had a pregnant adolescent sister and 122 youth who had an adolescent sister who had never been pregnant. Youth and their mothers were studied at 4 time points across 15 months: The families of pregnant adolescents were studied when the adolescent sister was in her third trimester of pregnancy, and at 2 months, 6 months, and 12 months postpartum; the families of never-pregnant adolescents were studied at like intervals. Individual fixed-effects structural equation models were computed, which control for earlier measures of study constructs and thereby reduce omitted variable bias from preexisting family group differences. Results showed that an adolescent's childbearing was related to increases in family stress, which were related to increases in mothers' harsh parenting and mother-sibling conflict, which, in turn, were related to subsequent increases in siblings' problem behavior. Multiple group analyses revealed that the pathways through which a teenager's childbearing influences siblings operate similarly for girls and boys. Tests of an alternate ordering of model variables indicated a poor fit with the data. Findings provide evidence that the accumulation of stressful family changes following an adolescent's childbearing can negatively impact siblings. Findings also elucidate how family-level stress and disruption experienced across a family transition trickle down to affect family relationships and, in turn, child family members.

Keywords

adolescent childbearing; family stress; harsh parenting; mother-child conflict; siblings

The birth of a child introduces disequilibrium into the family system, requiring a reorganization of family roles and relationships (Heinicke, 2002). Indeed, becoming a parent is a major life transition, with the accompanying stress and strain likely to affect family relationships. Although a large literature shows that marital relations change significantly as adult couples transition to parenthood (reviewed in Mitnick, Heyman, & Smith Slep, 2009), little is known about how families change in response to an adolescent's childbearing, despite the fact that most adolescents continue to live with their families of origin after their babies are born (Manlove, Mariner, & Papillo, 2000). Families are likely strongly affected by an adolescent's childbearing, given probable changes in family routines, roles, and

responsibilities. Understanding how families change in the aftermath of an adolescent's childbearing is important given that the younger siblings of parenting adolescents are known to engage in disproportionately high levels of drug and alcohol use, sexual activity, and delinquency compared with their peers who do not have a teenage parenting sister (East & Jacobson, 2001). The younger sisters of parenting adolescents also have teen childbearing rates up to 6 times higher than women in the general population (Cox, Emans, & Bithoney, 1993; East, Reyes, & Horn, 2007). A common interpretation of siblings' disproportionately high levels of problem behavior and early childbearing is that they share the same background risk factors as their older pregnant or parenting sister. However, this interpretation ignores the possibility that an older sister's childbearing itself creates new risks for siblings. It is possible, for example, that younger siblings' problematic adjustment results from, or becomes exacerbated by, the general family disruption that follows a teenage sister's childbearing. The current study examines this issue by determining how family changes brought about by an adolescent's transition to parenthood affect family relationships and, in turn, siblings' adjustment. Figure 1 shows the conceptual model to be tested.

Family stress theory (McCubbin & Patterson, 1983) provides the theoretical framework for the current study, wherein an adolescent's childbearing is conceptualized as a stressful and challenging event that causes multiple family changes and general family disruption (Price, Price, & McKenry, 2010). In family stress theory, the accumulation of change is thought to "spill over" or "trickle down" to smaller dyadic family subsystems and to individual family members (Lavee, McCubbin, & Olson, 1987). Several studies have provided evidence of cross-system spillover, with overall family stress affecting parents' parenting and parents' psychological health (Deater-Deckard, Chen, Wang, & Bell, 2012; Nelson, O'Brien, Blankson, Calkins, & Keane, 2009). The current study examines such cross-system effects to determine how, during a period of expected rapid change (across an adolescent's transition to parenthood), family stress precipitates dyadic-level change (changes in mother-sibling relations), which then produces individual-level change (changes in sibling adjustment).

Adolescent Childbearing and Family Disruption

An adolescent's childbearing likely has a large and profound impact on the adolescent's family, with the family unit needing to adapt to accommodate the teen's baby into the household. As with most major family transitions, changes likely occur in household composition, family routines, living and sleeping arrangements, and parents' work patterns—causing an increase in family stress, chaos, and general disruption (East & Chien, 2010; East, Slonim, Horn, & Reyes, 2011). For example, in many families of parenting adolescents, the teenager's grandmother joins the household to help care for the teen's baby as well as the other children in the household (Contreras, 2004; Oberlander, Black, & Starr, 2007). The teen's boyfriend or father of the baby might also choose to live with the teen's family or spend significant time in the teen's home, both of which can be unsettling to family routines (Florsheim et al., 2003). If working, the adolescent's mother might quit her job to help care for her young grandchild; or, alternately, she might be required to find a paying job to help financially support the teen's child. Having the teen's baby join the household also likely requires significant change in how family income is spent in order to incorporate the added expenses associated with the baby. Families might need to borrow money from relatives or accrue debt on credit cards just to stay financially afloat. The accumulation of such changes across a relatively short time period constitutes major stress for the family unit, potentially leading to family strain and conflict (Lavee et al., 1987). Two aspects of family relationships likely affected by such strain are a mother's harsh treatment of her children (i.e., the adolescent's siblings) and the level of mother-sibling conflict.

Mother—Sibling Relations Mediating the Link Between Family Stress and Sibling Adjustment

It is well-documented that stressful life events contribute to mothers' harsh and critical treatment of their children (Taylor, Roberts, & Jacobson, 1997; Tein, Sandler, & Zautra, 2000), and that such parenting tactics bring about children's internalizing and externalizing adjustment difficulties (reviewed in Conger, Conger, & Martin, 2010). Frequent changes in family structure and its attendant stress also have been shown to escalate mothers' coercive disciplinary practices, which lead to children's acting-out behaviors (Hao & Xie, 2002; Martinez & Forgatch, 2002). The effect of family stress on children's adjustment as mediated by hostile, rejecting, or unresponsive parenting has been found in Latino families (Gonzales et al., 2011; Parke et al., 2004), African American families (Conger et al., 2002), and Caucasian families (Martinez & Forgatch, 2002); thus, this process of influence does not appear to be specific to any one racial/ethnic group.

The multiple family changes necessitated by incorporating a teenager's baby into the household also likely lead to increased mother-child conflict or conflict between the adolescent's mother and siblings. Mother-child conflict is known to result from excessive family transitions, for example, those associated with divorce and remarriage (Hetherington & Stanley-Hagan, 2002), and longitudinal studies have shown that parent-child conflict precedes adolescents' depressive symptoms and problem behaviors (Klahr, McGue, Iacono, & Burt, 2011; Sagrestano, Paikoff, Holmbeck, & Fendrich, 2003). Importantly, at least two studies have shown that parent-child conflict mediates the association between family stress and children's developmental problems (Conger, Ge, Elder, Lorenz, & Simons, 1994; Gutman & Eccles, 1999). Thus, increased mother-sibling conflict is expected to result from increases in family disruption, as well as to contribute to increases in siblings' problematic adjustment.

Differences in Family Process by Sibling Gender

Studies conducted to date indicate that younger sisters appear to be more adversely affected by a sister's teenage childbearing than younger brothers. For example, compared with younger brothers, the younger sisters of childbearing adolescents show greater increases in drug and alcohol use and partying behaviors across time (East & Jacobson, 2001). Within the framework of the proposed mediational model, it is possible that younger sisters' greater vulnerability to problematic adjustment is explained by gender differences in the paths mediating the effects of a sister's childbearing to sibling adjustment. Given the potential for gender-specific processes leading to sisters' and brothers' adjustment, gender differences in the proposed mediational model are tested.

The Current Study

The current study examined how the accumulation of stressful family changes following an adolescent's childbearing affects family relations and, in turn, the adolescent's siblings. We study these issues to elucidate how changes in family processes brought about an adolescent's childbearing contribute to the adjustment difficulties exhibited by the younger siblings of parenting teens. We focus on Latino families, most of whom were Mexican American, which is deliberate and important for several reasons. Latinos have had the highest teenage birthrate of any racial/ethnic group in the United States for the past 15 years, and Mexican Americans have the highest teen birthrate of all Latino subgroups (Ventura, Mathews, Hamilton, Sutton, & Abma, 2011). Moreover, U.S. Latinos have disproportionately high fertility rates (Suro & Passel, 2003); thus, presumably many siblings would be affected by a teenager's childbearing.

Latino younger siblings in two family contexts were studied: those who had a pregnant adolescent sister and those who had an adolescent sister who had never been pregnant. Sample recruitment and statistical analysis features were employed to make the two family types as comparable as possible, net of the adolescent's childbearing (described in Participants section). Drawing from the literature reviewed, we hypothesized that an adolescent's childbearing will lead to increases in family disruption, and that increased family disruption will give way to increases in mothers' harsh-critical treatment toward siblings and mother-sibling conflict (Hypothesis 1). We further hypothesized that increases in mothers' harsh treatment and mother-sibling conflict will mediate the association between increased family disruption and siblings' adjustment difficulties, operationalized as increases in drug use and delinquency, school disciplinary problems, defiant behaviors, and depressive symptoms (Hypothesis 2). We also examined whether these within-family processes differ for younger brothers and younger sisters, and whether an alternate ordering of study variables might fit the data. This latter test was conducted so as to potentially rule out a competing ordering of effects.

Method

Participants

The study sample included 243 Mexican American youth: 121 youth who had an older pregnant adolescent sister and 122 youth who had an older adolescent sister who had never been pregnant. Siblings were an average age of 13.7 years ($SD = 1.7$), and 62% ($n = 150$) were girls. Youth were from 188 families (95 families with a pregnant adolescent and 93 without), with 188 of youths' mothers also participating. All younger siblings of eligible age (11 to 18 years) per family were invited to participate; 140 families had one sibling participate, 41 families had two siblings participate, and seven families had three siblings participate. The percentages of families with more than one sibling participating were equivalent for the two family types.

Study participants were recruited by first identifying pregnant adolescents and never-pregnant adolescents. Pregnant adolescents were recruited from high schools, Women, Infants, and Children (WIC) program centers, and community clinics throughout a five-county urban area in Southern California. Eligibility requirements were that the adolescent was Latina, between 15 and 19 years of age, unmarried, pregnant for the first time, intending to deliver and parent her child, living with her family of origin, and had an 11- to 18-year-old biologically related younger sibling with whom she was currently living. Because we were interested in family change following an adolescent's childbearing, families were eligible if there was only one pregnant adolescent within the family and no other child in the family had become pregnant or fathered a child as a teenager. Thus, all families had not been previously "exposed" to an adolescent's pregnancy or childbearing. Ninety-seven percent of all eligible families invited to participate did so.

Never-pregnant adolescents were recruited using a two-pronged approach: first, by asking participating pregnant adolescents to suggest a never-pregnant girlfriend who fit the eligibility criteria (described next paragraph), and second, by asking Latina students at high schools that had a Pregnant Minor or Teen Parenting Program whether they had a teenage girlfriend who was pregnant or parenting. This was done to obtain a comparison group of families that was as similar as possible to the adolescent childbearing families—net of the childbearing. Extensive literature shows that individuals select friends who are most like them in terms of attitudes, values, and risk behaviors (Maxwell, 2002). Thus, the families of the girlfriends of pregnant or parenting adolescents were used here as a comparison group with the families of pregnant adolescents. This seems like a reasonable tact, given that adolescent pregnancy is not randomly represented in families. Despite these efforts, though,

differences in the study variables between the two family types might still be present at enrollment. Such differences could reflect long-standing disparities, or they might reflect reactions to the teenager's pregnancy for the families with a pregnant teen. It is not possible within the current study to determine the origins of these differences, given that the families with a pregnant teenager were assessed only after she became pregnant.

Eligibility criteria for the never-pregnant adolescent participants were that she was Latina, between 15 and 19 years of age, unmarried, had never been pregnant, was living with her family of origin, had an 11- to 18-year-old biologically related younger sibling with whom she was currently living, and none of her siblings ever had a child or fathered a child as a teenager. Adolescents' never-pregnant status was assessed by interview in the enrollment phase and again at the first study time point (approximately one to two weeks later). All enrolled adolescents answered consistently at both time points that they had never been pregnant.

All participating older sisters and younger siblings described themselves as Mexican American. Most younger siblings were born in the United States (82%); the others were born in Mexico. All but seven mothers described themselves as Mexican American; these seven mothers were Latina of Central American descent. Mothers were born in Mexico (78%), the United States (18%), or Central America (4%). Equivalent percentages of siblings and mothers in each family group were born in the United States. All study families was primarily low income, with a mean total annual family income of \$20,995. Other descriptive background information of study families is shown in Table 1.

Study Design and Attrition

Families participated at four time points over a 15-month period. The families with a pregnant adolescent participated when the adolescent was in her third trimester of pregnancy (an average of 7.5 months pregnant; Time 1), and at 2 months, 6 months, and 12 months postpartum (study time points 2, 3, and 4, respectively). Families of never-pregnant adolescents participated at like intervals. Of the 243 siblings participating at the study's initial time point, 224 (92%) participated at Time 2, 203 (84%) participated at Time 3, and 196 (81%) participated at Time 4. Although study analyses used the full information maximum likelihood (FIML) method of handling missing data, which retains all cases, it is important to assess whether selective attrition occurred. To do so, we compared families and siblings who remained in the sample at the final study time point with those who had dropped out by that time on the family and sibling variables analyzed (all those shown in Table 1). No differences were found between families or siblings who dropped out and those who remained in the study on any of these variables. In addition, all participating older sisters and younger siblings were living with their families of origin at each of the study's follow-ups, and none of the originally nonpregnant adolescents or their siblings became pregnant (or caused a pregnancy) over the course of the study.

Procedure

Mothers and siblings completed a short in-person interview about basic descriptive and background information and a self-administered questionnaire in their homes at the four study time points. Two Latina female research assistants who were fluent in Spanish administered the interview and provided instructions for completing the questionnaire. The study questionnaire had an approximate third-grade reading level (as ascertained by the Flesch-Kincaid readability method). All siblings were highly fluent in English and completed the study interview and questionnaire in English. The mothers responded in either English (30%) or Spanish (70%), whichever was most comfortable for them. Equivalent percentages of mothers per family group completed the forms in Spanish. Completion of the

interview and questionnaire took about one hour. All participants were paid \$20 at each time point, and all were assured of the confidentiality of their responses. This study's procedures were approved by the first author's university Human Subjects Protections Program.

Measures

The cultural sensitivity of the measures for the target population of predominantly low-income Latino families was considered in the early phases of this study by involving a large group of Mexican American colleagues (of various educational backgrounds and areas of expertise) who reviewed all measures prior to administration to determine their adequacy and understanding for the population studied. This group concluded that all measures were culturally appropriate and sensitive to the cultural context of study participants. Linguistic consistency between the English and Spanish versions of the mother-rated questionnaire was achieved by having a native Mexican-Spanish speaker translate the English version of all items into Spanish. A second native Mexican-Spanish speaker reviewed and verified all translations; discrepancies were resolved through discussion. A third Mexican-Spanish speaker then back translated the Spanish version into English. The study investigators then compared the original English version with the back-translated English version and verified that the two versions were equivalent.

As outlined in the Analytic Strategy section, the Time 1 assessments of all study constructs were included in the modeling analyses, as well as the Time 2 family disruption score, the Time 3 mothers' harshness and mother-sibling conflict scores, and the Time 4 scores of sibling adjustment. All measures were comprised of identical items and response options at all time points, and all scales had good internal reliability at all study time points (shown in Table 1).

Family disruption—Mothers completed the Family Inventory of Life Events and Changes (FILE; McCubbin & Thompson, 1991), which assesses the occurrence of disruptive family events, such as a family move, a change in a parent's employment status or a child's school, and the loss or addition of a family member to the household. The current study utilized 35 of the original FILE items, and three items pertaining to financial stress were added ("filed for bankruptcy," "borrowed money from a friend or relative," and "had to consolidate debt to avoid loan collectors"). Four original FILE items were separated into eight items (e.g., "Spouses or parents were separated or divorced" was asked as, "Spouses or parents were separated" and "Spouses or parents were divorced"). Items pertaining to a family member's unplanned or difficult pregnancy and the addition of the teen's baby to the household were excluded. For each of the 46 items, mothers responded whether the event had occurred within the last two months (0 = *no*, 1 = *yes*); the sum total of family disruptive events was used (range 0 to 46).

Mothers' harsh treatment—Mothers' harsh treatment toward siblings was assessed by eight questionnaire items that asked mothers how often they "shouted or yelled at," "criticized or nagged," and "hit or slapped" each of their participating children within the last month (adopted from Parke et al., 2004). Response options ranged from 1 (*not at all*) to 5 (*very often*), with high scores indicating mothers' frequent harsh treatment. The items were averaged within each time point to form one score (range 1 to 5).

Mother-sibling conflict—Mother-sibling conflict was assessed by 18 items on the Issues Checklist (Prinz, Foster, Kent, & O'Leary, 1979), which asked mothers to rate the frequency of arguments that occurred with each of their children about issues that typically arise between parents and their adolescent children, such as how the child spends his or her time and who his or her friends are. For each issue, mothers indicated whether or not that

topic had been discussed in the past month, and if it was, how frequently they and their child argued about it, with 1 indicating “we didn’t argue about this,” and 5 indicating “we argued about it very often.” The frequency ratings were then averaged across all issues discussed (range 1 to 5). This approach best captures the frequency of conflict on issues salient to each specific mother–adolescent dyad (Prinz et al., 1979).

Sibling drug use and delinquency—Siblings’ drug use and delinquent behaviors were indexed by 18 questionnaire items that asked about how often during the last month the sibling had used drugs or alcohol (9 items, e.g., “I drank beer or wine,” “I smoked marijuana [pot, weed, or grass]”), got into a physical fight (2 items, e.g., “I hit or punched someone”), and engaged in delinquent-like behavior (7 items, e.g., “I stole something from a store”). Response options were 0 = *never*, 1 = *one time*, 2 = *2 or 3 times*, 3 = *4 to 10 times*, and 4 = *more than 10 times*. To reduce a skewed and kurtotic distribution that results from this scaling, all item responses were dichotomized into 0 (*never*) or 1 (*one or more times*). A single score was then formed by summing the number of problem behaviors engaged in one or more times during the last month (range 0 to 18).

Sibling school disciplinary problems—Siblings’ school disciplinary problems were assessed using youths’ responses to seven questions that asked how often during the last month they “ditched” a class at school, cut a day of school, got sent to the principal’s office for getting into trouble, had to go to Saturday school, got a detention, got a suspension, and got expelled. Response options were 0 = *never*, 1 = *one time*, 2 = *2 or 3 times*, 3 = *4 to 10 times*, and 4 = *more than 10 times*. To reduce the skewness and kurtosis that results from this scaling, all item responses were dichotomized into 0 (*never*) or 1 (*one or more times*). Scales were then constructed by summing the number of disciplinary actions the sibling had received one or more times (range 0 to 7).

Sibling defiant behaviors—Siblings’ defiant behavior was assessed using youths’ responses to seven items that asked whether during the last month they had, for example, snuck out of the house, lied to a parent about where they were going, stayed out all night without parents’ permission, and ran away from home. Scores were dichotomized into 0 (*never*) or 1 (*one or more times*) to reduce skewed and kurtotic distributions. The items were then summed to indicate the number of defiant behaviors the youth had engaged in one or more times (range 0 to 7).

Sibling depressive symptoms—Siblings’ depressive symptoms were measured using five items that asked how often during the past month the sibling “felt depressed,” “sad,” or “like crying” (adapted from the Center for Epidemiological Studies Depression Scale; Radloff, 1977). Responses ranged from 1 (*never*) to 5 (*very often*). The items were averaged within each time point to form one score (range 1 to 5).

Control variables—Control variables included younger siblings’ age and gender, older sisters’ age, mothers’ educational level (total years of schooling), mothers’ marital status (married or living with a partner vs. unmarried and not living with a partner), total annual family income, and family size (number of individuals living in household).

Analytic Strategy

Individual fixed-effects structural equation modeling was used to estimate the model pathways. Individual fixed-effects models are particularly relevant in the current design because they reduce bias due to unobserved variables (Duncan, Magnuson, & Ludwig, 2004; Schneider, Carnoy, Kilpatrick, Schmidt, & Shavelson, 2007), which, in this case, might derive from preexisting differences between the two family types. That is, despite design

and recruitment efforts to have families with and without a pregnant adolescent as similar as possible, the two family types might differ in ways aside from the adolescent's pregnancy. Individual fixed-effects models, which control for Time 1 (prenatal) measures of all the model's endogenous variables (as shown in Figure 2), serves two functions: It increases confidence that study findings are not merely the result of preexisting differences in model constructs because these earlier levels are explicitly controlled for, and second, it reduces the influence of time-invariant unobserved variables (e.g., mothers' personality traits) because, presumably, these time-invariant variables influence prenatal and postpartum measures similarly. Thus, when initial measures are controlled, the influence of time-invariant unobserved variables on subsequent (postpartum) measures is also controlled. Of course, time-varying unobserved variables remain unaccounted for (Duncan et al., 2004). Nonetheless, employing individual fixed-effects models reduces bias from omitted variables and bolsters confidence that results are not merely due to preexisting family conditions.

Four models were tested—one for each sibling adjustment variable. Three model fit indices were used to examine how well the models fit the data: the chi-square, which is not significant when model fit is good; the comparative fit index (CFI; Bentler, 1990), with values above .90 indicating a reasonably good fit (Hu & Bentler, 1999); and the root mean square error of approximation (RMSEA), with values less than .08 indicating adequate fit (Kline, 2011). Analyses retained all cases by using the FIML method of handling missing data, which fits the model being tested directly onto the nonmissing data for each participant. The maximum likelihood estimation (MLR) estimator was used. Because some families had two or more younger siblings participate, the CLUSTER command was used which appropriately accounts for the nested data structure. The bias-corrected bootstrapping procedure in Mplus was used to test for mediation (Muthén & Muthén, 1998–2007). Because the sample is somewhat small for detecting indirect effects across a relatively complex model, indirect effects were estimated separately for each mother–sibling parameter; that is, we tested the indirect effect via mothers' harshness and then, separately, tested the indirect effect via mother–sibling conflict. To test whether the overall model differed by sibling gender, we conducted an omnibus test using multiple group analyses, which compares a baseline model where all paths are constrained to be equal across gender to a model where all paths are allowed to vary freely. A chi-square difference test, adjusted using a correction factor to account for nonnormality (Satorra & Bentler, 2001), was then used to assess the equivalence of the fully constrained model to the fully unconstrained model. If significant, it can be concluded that the model structure is different for boys and girls. Finally, we tested an alternate ordering of study variables to potentially rule out a different ordering of effects and thereby bolster interpretation about the proposed direction of effects. We also used modification indices within Mplus to determine whether additional paths not shown in Figure 1 would significantly improve model fit.

For all models, sibling age and gender were included as covariates on the endogenous sibling adjustment variable and on the two mother–sibling relationship endogenous variables because sibling age and gender are likely associated with both sibling adjustment and mother–sibling relations. Family income, family size, mothers' educational level, and marital status were included as covariates on the endogenous family disruption variable, and older sister's age was included as a covariate on the model's exogenous variable "older sister is pregnant." In addition, model analyses were originally conducted statistically controlling for mothers' age, language of questionnaire, whether U.S. born, and whether the sibling was U.S. born. None of these factors were significantly related to the variables in the model, nor did they result in significant changes to path coefficients; thus, these variables were omitted from the model. The two mother–sibling relationship variables were allowed to correlate for all models.

Results

Descriptive Statistics and Correlations

Comparison of families with and without a pregnant adolescent (see Table 1) shows that family disruption was higher in families with a pregnant (parenting) adolescent at Time 1 and 5 months later at Time 2. In addition, mothers' harsh treatment toward siblings was higher in families with a pregnant (parenting) adolescent, both at Time 1 and 9 months later at Time 3. Regarding sibling adjustment, siblings with a pregnant (parenting) adolescent sister engaged in more drug use and delinquent behaviors at the fourth study time point (1 year postpartum), and showed more defiant behaviors and depressive symptoms both at Time 1 and Time 4.

Bivariate correlations were conducted among the model's exogenous variable (whether the older sister was pregnant) and the model's endogenous variables (see Table 2). Correlations were also computed between older sister's pregnancy status and the sibling adjustment variables at Time 1 (not shown), with siblings' defiant behaviors ($r = .16, p < .05$) and depressive symptoms ($r = .13, p < .05$) significantly correlated with having a pregnant older sister.

Individual Fixed-Effects Path Model Results

Results of individual fixed-effects path models showed that model fit was good for all models, as indicated by the chi-square (all nonsignificant), CFI (all $> .90$), and RMSEA (all $< .06$; Table 3). Figure 2 shows the associations between having a pregnant older sister and younger sibling outcomes as mediated by family disruption and mother-sibling relations. Path coefficients from having a pregnant sister to family disruption, and from family disruption to the two mother-sibling relationship variables were virtually identical for the four models (differences were in the hundredths place), with having a pregnant older sister associated with increases in family disruption five months later ($B = 2.01, SE = 0.70, \beta = .21, p < .01$), and family disruption associated with subsequent increases in mothers' harshness ($B = .02, SE = .01, \beta = .17, p < .05$) and mother-sibling conflict ($B = .03, SE = .01, \beta = .25, p < .01$). Path coefficients to the four sibling adjustment variables at Time 4 (1 year postpartum) indicated that increases in maternal harshness were associated with subsequent increases in sibling school disciplinary problems, and increases in mother-sibling conflict were associated with subsequent increases in sibling drug use and delinquency, defiant behaviors, and depressive symptoms. Having a pregnant older sister was not directly related to either maternal harshness or mother-sibling conflict (not shown in Table 3), nor to any of the sibling adjustment outcomes (shown in Table 3) after accounting for mediated paths. The amount of variance accounted for in sibling adjustment by the model variables ranged from .14 to .46 and was significant in all cases (far-right column in Table 3).

Tests of Indirect Effects

To address Hypothesis 1, we tested the extent to which family disruption mediates the association between having a pregnant teenage sister and mothers' harsh parenting and, separately, whether family disruption mediates the association between having a pregnant teenage sister and mother-sibling conflict. Both mediated pathways showed significant indirect effects (Table 4, top). Next, we examined the pathways from family disruption to sibling adjustment as mediated through mothers' harsh treatment and, separately, as mediated through mother-sibling conflict (Hypothesis 2; Table 4, bottom; first and second columns from left). Results showed a marginally significant indirect effect from family disruption to mothers' harshness to sibling school disciplinary problems, but significant indirect effects were found through mother-sibling conflict for sibling drug use and

delinquency, defiant behaviors, and depressive symptoms, and a marginally significant indirect effect was found for school disciplinary problems. (Confidence intervals of all indirect effects can be obtained from the authors upon request.)

To gauge the strength of mediation for both sets of mediated pathways, we tested the indirect effects for the full model, that is, from older sister is pregnant to sibling outcomes as mediated by family disruption and the two mother–sibling relationship variables. Results showed only marginally significant indirect effects when mediated through mothers' harshness to sibling school disciplinary problems ($B = .024$, $SE = .01$, $p < .10$), and marginally significant indirect effects when mediated through mother–sibling conflict to sibling school disciplinary problems ($B = .069$, $SE = .04$, $p < .10$) and defiant behaviors ($B = .025$, $SE = .01$, $p < .10$). When considered additively and simultaneously, however, the sum of the indirect paths through mothers' harshness and mother–sibling conflict for the full model was significant for three of the four sibling adjustment variables (Table 4, bottom; far-right column).

Gender Differences in Path Model Structure

The omnibus chi-square difference tests were nonsignificant for all sibling outcomes, suggesting that the model relations did not differ by sibling gender.

Tests of Alternate Ordering of Effects

Given that multiple wave data of the intervening variables are available, it would be helpful to know if an alternate ordering of effects fits the data. To address this, we tested an alternate study model that included pathways from Time 1 older sister's pregnancy status, to Time 2 mothers' harshness and Time 2 mother–sibling conflict, to Time 3 family disruption, to Time 4 sibling adjustment. Four fixed-effects structural equation models were tested, one for each sibling outcome, and all covariates controlled in previous models were included. Results indicated that all four models showed poor fit. Finally, results of modification indices computed in tests of our original conceptual model (shown in Figures 1 and 2) indicated that additional pathways would not produce a better fit with the data.

Discussion

Results of the present study indicate that an adolescent's childbearing leads to increases in family stress, and that increased family stress leads to increases in mothers' harsh parenting and mother–sibling conflict, which, in turn, lead to subsequent increases in siblings' problem behavior. Thus, having a pregnant older sister appears to set in motion a series of changes that ultimately lead to declines in siblings' adjustment. In broad terms, findings support the fluid and systemic aspects of family stress theory, such that family level stress can “trickle down” to affect family relations, which then affect individual family members (Lavee et al., 1987; McCubbin & Patterson, 1983). Pragmatically, results suggest that the problem behaviors observed in the siblings of parenting teens derive, at least in part, from family changes experienced *after* the adolescent gives birth. This is an important finding because the poorer adjustment observed among the siblings of parenting teens relative to the siblings of nonparenting teenagers might not simply reside in preexisting differences in home environments or family conditions, but rather in changes in family and parenting dynamics that occur after the older sister has her baby. In fact, younger siblings' adjustment was not directly associated with their sister's pregnancy status, but rather was associated only to family process changes that occurred subsequent to the teen's childbearing. The absence of a direct association between a sister's pregnancy and sibling adjustment one year later actually underscores the importance of family process changes put in place by a sister's childbearing. That is, it is through increased family stress and poorer mother–sibling

relations that siblings appear to be affected. Given that the problem behaviors examined in the current study (drug use, delinquency, school disciplinary problems, depressive symptoms) are known to precede early sexual activity and early pregnancy (Hipwell, Keenan, Loeber, & Battista, 2010; Scaramella, Conger, Simons, & Whitbeck, 1998), it is possible that the family changes brought about by an adolescent's childbearing set in motion a cascade of problem behaviors among younger siblings which lead to *their* early parenting. This type of family driven process could partially explain the repeated pregnancies across children within a family and the disproportionately high teenage birthrates among the sisters of childbearing adolescents.

It is important to note, however, that the younger siblings of pregnant teens showed some elevation in problem behaviors while their adolescent sister was pregnant, compared with the younger siblings of nonpregnant teens (in defiant behaviors and depressive symptoms). Similarly, levels of family disruption and mothers' harsh parenting were already higher in families with a pregnant teenager relative to families without a pregnant teenager prior to the teenager's childbearing. Because the timing of the first assessment was while the adolescent was well into her pregnancy, mothers and siblings might be reacting to their daughter/sister being pregnant. Without assessments before the teenager became pregnant, it is not possible to determine exactly when family and sibling functioning begin to decline. Nevertheless, as evident in the pattern of family group differences found here, family and sibling functioning depart more significantly from that of families without a pregnant teenager after the teenager gives birth (i.e., family group differences were greater following the teenager's childbearing than initially when the teenager was pregnant). Thus, at the very least, one can conclude that families' and siblings' problematic functioning become exacerbated by the teenager's childbearing, as opposed to claiming that their adjustment difficulties originated solely from the adolescent's childbearing itself.

Results of the path coefficients showed that increases in mother-sibling conflict had more pervasive effects on sibling adjustment than increases in mothers' harshness. It is noteworthy that mother-sibling conflict increased across the study period, whereas mothers' harshness remained relatively stable. Together, these findings suggest that mother-sibling conflict might be particularly reactive to stressful family conditions and a strong precipitant to youths' acting-out behaviors. Rarely have mother-youth conflict and mothers' harsh parenting been examined simultaneously vis-à-vis family stress; thus, replication is needed to confirm these associations.

Because findings indicated that the processes to siblings' adjustment were similar for younger brothers and younger sisters, it remains unclear what processes might explain the greater vulnerability to problem behavior among the younger sisters of parenting teens relative to younger brothers. Younger sisters' engagement in problem behavior is known to increase with age relative to brothers, but with levels of problem behaviors at age 13 comparable between brothers and sisters (East & Jacobson, 2001). Given that the siblings in the current study were, on average, approximately 13 years of age, this developmental gender-divergence may not yet have occurred or is not yet apparent. In addition, the snapshot of younger siblings depicted here is still relatively recent from the older sister's childbearing. Perhaps the family influences that contribute to siblings' problematic behaviors have stronger effects on sisters than brothers across time.

Strengths and Limitations

A limitation of the current study is that the changes in family disruption and mother-sibling relations, even though temporally grounded in an adolescent's transition to parenthood, might be unrelated to this event and instead occurred in reaction to other extraneous

influences or reflect general developmental trends (Tsai, Telzer, & Fuligni, 2012). These and other explanations are possible and should be considered.

Other limitations were that the indirect effects for the full model were largely nonsignificant, and effect sizes even for the significant pathways were relatively small. We suspect that the absence of significant indirect effects for the full model were due to the small magnitude of effect sizes coupled with the complexity of the model (i.e., sequentially testing two mediators). Insignificant indirect effects can occur in spite of significant individual pathways (as was the case in the current analyses) because of low power associated with the test of mediation (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). When demands on power were reduced, such as when testing for mediation for parts of the model or when simultaneously considering the indirect effects through both mothers' harshness and mother-sibling conflict, significant mediation was found. In addition, tests of an alternate ordering of effects indicated a poor fit with the data, strengthening interpretation about the direction of effects. Nevertheless, considering the absence of significant indirect effects for the full model, as well as the relatively modest effect sizes and the lack of a direct association between sister's pregnancy and sibling outcomes (cited previously), one must be cautious when making conclusions about the cumulative process as outlined in the full model.

In addition, the age of the parenting teenager likely has large ramifications for family functioning and involvement, and this, as well as the ages of the siblings, should be considered more specifically in future studies of this kind. It would also be important to examine potential changes in father-sibling relations as a function of an older sister's childbearing.

An important strength of the current study was employing fixed-effects models, which reduce bias due to unobserved variables and thereby provide a stronger case that the observed relationships are causal (Duncan et al., 2004). In particular, controlling for earlier measures reduces the possibility that study findings can be attributed to preexisting differences between youth who have and do not have a pregnant teenage sister.

Clinical Implications

Regarding this study's clinical implications, it would be beneficial for the families of pregnant teenagers to anticipate the stress and disruption that accompany the teenager's transition to parenting (i.e., grandmother and/or father of the baby moving in, financial troubles). Taking a proactive approach by helping family members to anticipate future family changes and to map out a reasonable and appropriate plan to deal with such changes might help thwart subsequent conflict and tension. Second, findings provide important evidence that a teenager's childbearing has the potential to put into place new risk factors that contribute further to siblings' problem behaviors. As such, results highlight the importance of intervening with such siblings during this transition period to prevent a further escalation of troubling behaviors. Third, given that mother-sibling conflict appears to be a central mediator between family stress and siblings' adjustment difficulties, it would be important to address parent-child relational issues in families with a pregnant or parenting teenager in an intervention or program setting. Programs that provide opportunities for mothers to bond and connect with their younger children could help avert future sibling maladjustment. Similarly, simply informing mothers about their other children's vulnerability to drug use, delinquency, and depression might increase mothers' understanding of the need to be supportive of and sensitive to their younger children.

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Figure 1. Conceptual model of how an adolescent's pregnancy and childbearing lead to family disruption, mothers' harsh treatment toward siblings and mother-sibling conflict, which adversely affect siblings' adjustment.

Figure 2.

Individual fixed-effects model. Standardized regression coefficients are shown. Coefficients for the autoregressive paths are not shown. Dashed paths are not statistically significant. For families with a pregnant adolescent, Time 1 occurred when the adolescent was pregnant, Time 2 occurred at 2 months postpartum, Time 3 occurred at 6 months postpartum, and Time 4 occurred at 1 year postpartum. ^a This path was significant for siblings' school disciplinary problems. ^b This path was significant for siblings' drug use and delinquency, defiant behaviors, and depressive symptoms. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 1
Description of Sample and Study Variables by Family Type (N = 243 Siblings and 188 Mothers)

Variable (score range)	Siblings with a pregnant older sister (n = 121)		Siblings with a never- pregnant older sister (n = 122)		Difference	Cronbach alpha
	M	SD	M	SD		
Controls						
Siblings' age (11–18 years)	13.93	1.84	13.50	1.63	ns	
Sibling gender (0 = boy, 1 = girl) ^a	0.60	—	0.64	—	ns	
Mothers' age (30–59 years)	39.91	4.91	39.30	5.51	ns	
Mothers' educational level (third grade to post college)	9.01	3.54	8.79	3.47	ns	
Family income (total annual; <\$5,000 to >\$60,000)	\$20,887	12,708	\$21,102	13,541	ns	
Family size ^b (3–10)	5.73	2.12	5.57	1.81	ns	
Mother married or living with partner (0 = no, 1 = yes)	0.55	—	0.69	—	*	
Older sisters' age (15–19 years)	17.25	1.20	16.54	1.31	**	
Mother-rated						
Family disruption, T1 (0–46)	5.47	4.92	3.86	4.41	*	—
Family disruption, T2 (0–46)	5.95	5.52	3.91	3.69	**	—
Mothers' harshness toward sibling, ^c T1 (1–5)	1.90	0.54	1.73	0.55	*	.80
Mothers' harshness toward sibling, ^c T3 (1–5)	2.04	0.49	1.86	0.50	**	.82
Mother–sibling conflict, ^c T1 (1–5)	2.05	0.67	2.03	0.67	ns	.87
Mother–sibling conflict, ^c T3 (1–5)	2.45	0.69	2.47	0.54	ns	.90
Sibling-rated:						
Sibling drug use and delinquency, T1 (0–18)	3.64	4.43	2.89	4.09	ns	.87
Sibling drug use and delinquency, T4 (0–18)	4.66	5.98	3.07	3.82	*	.88
Sibling school discipline problems, T1 (0–7)	1.46	1.66	1.19	1.45	ns	.81
Sibling school discipline problems, T4 (0–7)	1.50	1.72	1.20	1.60	ns	.83
Sibling defiant behaviors, T1 (0–7)	1.34	1.84	0.83	1.25	*	.78
Sibling defiant behaviors, T4 (0–7)	1.51	1.91	0.82	1.43	**	.86
Sibling depressive symptoms, T1 (1–5)	2.41	1.24	2.11	0.97	*	.92
Sibling depressive symptoms, T4 (1–5)	2.38	1.01	2.09	1.01	*	.88

Note. T1 = Time 1 (prenatal); T2 = Time 2 (2 months postpartum); T3 = Time 3 (6 months postpartum); T4 = Time 4 (1 year postpartum).

^dFor families with a pregnant older sister, 72 siblings were girls (60%), 49 were boys (40%); for families with a nonpregnant older sister, 78 siblings were girls (64%), 44 were boys (36%). These percentages were not significantly different for the two family types.

^bNumber of individuals living in household.

^cMother ratings were child-specific; 48 mothers rated more than one of their children.

* $p < .05$.

** $p < .01$.

Table 2
Correlations Among Having an Older Sister Who Is Pregnant and the Model's Endogenous Variables (N = 243)

Variables	1	2	3	4	5	6	7
1. Older sister pregnant ^d	—						
2. Family disruption, T2	.23**	—					
3. Mothers' harsh treatment of sibling, T3	.20**	.25**	—				
4. Mother-sibling conflict, T3	.07	.32***	.60***	—			
5. Sibling drug use and delinquency, T4	.14*	.26**	.20**	.27***	—		
6. Sibling school disciplinary problems, T4	.10	.24**	.24**	.24**	.67***	—	
7. Sibling defiant behaviors, T4	.20**	.19*	.14*	.28***	.63***	.48***	—
8. Sibling depressive symptoms, T4	.15*	.20*	.12	.21**	.19**	.13	.22**

Note. T2 = Time 2 (2 months postpartum); T3 = Time 3 (6 months postpartum); T4 = Time 4 (1 year postpartum).

^d0 = no; 1 = yes.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 3

Regression Coefficients of Model Paths Predicting Increases in Sibling Problematic Adjustment From Increases in Mothers' Harshness, mother-sibling Conflict, and Having a Pregnant Older Sister (N = 243 Siblings)

	Δ Mothers' harshness $\rightarrow$ Δ Sibling adjustment			Δ Mother-sibling conflict $\rightarrow$ Δ Sibling adjustment			Older sister is pregnant $\rightarrow$ Δ Sibling adjustment			Sibling adjustment (Time 1) $\rightarrow$ Sibling adjustment (Time 4)			Model fit indices			
	B	SE	β	B	SE	β	B	SE	β	B	SE	β	$\chi^2(df)$	CFI	RMSEA	R ²
Drug use and delinquency	0.36	.65	.05	1.29	.62	.18*	0.30	.52	.04	.30	.08	.33***	30.90 (25)	0.975	0.031	.27***
School disciplinary problems	0.48	.24	.16*	0.33	.23	.12	0.32	.23	.10	.18	.10	.18	36.31 (25)	0.947	0.043	.14**
Defiant behaviors	0.06	.23	.02	0.54	.25	.19*	0.38	.20	.11	.55	.09	.51***	35.33 (25)	0.963	0.041	.46***
Depressive symptoms	0.03	.17	.01	0.24	.12	.14*	0.15	.14	.07	.40	.07	.43***	34.82 (25)	0.962	0.040	.30***

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 4

Summary of Indirect Effects

	Older sister pregnant → Δ Family disruption → Δ Mothers' harshness <i>B (SE)</i>	Older sister pregnant → Δ Family disruption → Δ mother-sibling conflict <i>B (SE)</i>	
	.033** (.02)	.052** (.02)	
	Δ Family disruption → Δ Mothers' harshness → Δ Sibling adjustment <i>B (SE)</i>	Δ Family disruption → Δ mother- sibling conflict → Δ Sibling adjustment <i>B (SE)</i>	Sum of indirect effects for full model via Δ Mothers' harshness and Δ Mother- sibling conflict <i>B (SE)</i>
Drug use and delinquency	.022 (.02)	.042** (.02)	.052** (.02)
School disciplinary problems	.013* (.01)	.007* (.00)	.054** (.03)
Defiant behaviors	.010 (.01)	.015** (.01)	.047** (.02)
Depressive symptoms	.003 (.00)	.017** (.01)	.037* (.02)

Note. Unstandardized coefficients are shown.

*
 $p < .10$.

**
 $p < .05$.