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Avoiding Adolescent Pregnancy: A Longitudinal Analysis of African American Youth

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Abstract

Purpose—The timing and social context of pregnancy have significant implications for the well-being of African American young people. Rarely, however, do studies focus on identifying the developmental processes associated with young people's avoidance of pregnancy until after adolescence.

Methods—We tested hypotheses regarding the factors associated with delayed fertility (no experience of a pregnancy by age 19) among a sample of 889 African American youth recruited at age 11 and assessed longitudinally through age 19. We hypothesized that, during preadolescence (age 11), health-promoting environmental processes would be linked to nurturant-responsive parenting, which in turn would be linked to youths' conventional future orientations and risky

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sexual behavior in midadolescence (age 16) and to pregnancy experience by late adolescence (age 19). Hypotheses were tested with logistic structural equation modeling.

Results—Our conceptual model fit the data well. We identified a cascade process whereby protective environments were associated with nurturant-responsive parenting, which was associated with youths' conventional future orientations; conventional future orientations were associated with avoidance of sexual risk behaviors at age 16 and avoidance of pregnancy by age 19. We identified an additional direct effect between nurturant-responsive parenting and avoidance of risky sexual behavior.

Conclusions—The results suggest processes that may be targeted to facilitate delayed fertility among African American youth.

Keywords

Pregnancy in Adolescence; African Americans; Adolescent Development; Health Behavior

African Americans are disproportionately represented among adolescent pregnancies (1). Compared with adult pregnancies, adolescent pregnancies are more likely to be unplanned and unwanted, take place outside of marriage, and confer risk for poverty and low paternal involvement (2). In contrast, when childbirth is delayed until after adolescence, families are more stable and have more economic, educational, and social resources (3,4). This imparts lasting benefits to children's mental health and academic achievement (5).

Poverty and social disadvantage constitute a primary contributor to precocious pregnancy (4), and African American youth are disproportionately likely to experience poverty (6). Although many negative consequences of adolescent fertility are attributable to the effects of growing up in poverty (5), adolescent pregnancy further complicates difficult life circumstances (7), impairing mental health and reducing opportunities for educational and vocational development (4).

Despite its prevalence, most African American adolescents avoid pregnancy. Even in economically distressed neighborhoods, health-promoting community and family relationships can discourage pregnancy (6, 8). Although the risk factors for precocious pregnancy are well understood, little research has investigated the health-promoting contextual and intrapersonal precursors of delayed fertility in adolescence, particularly among male youth. The present study was designed to address these research needs.

Study Hypotheses and Conceptual Model

The study hypotheses are summarized in Figure 1. We expect health-promoting environments in preadolescence to support nurturant-responsive parenting, which will promote avoidance of pregnancy by age 19 by increasing conventional future orientations and deterring risky sexual behavior at age 16. These predictions were informed by theory and research on reproductive strategies in adolescence (9). Using a life history framework, Belsky and colleagues (9) contended that youth who live in well-resourced and predictable environments are likely to develop a conventional reproductive strategy that includes delaying pregnancy until adulthood and having fewer children (10). Well-resourced and predictable environments foster nurturant-responsive parenting, which signals to children that the environment is safe; hence, planning for the future is preferable to seeking immediate gratification (11). In turn, we expected conventional, future-oriented youth to avoid the risky sexual behavior that leads to unplanned pregnancies in adolescence. Resilience (12, 13) and social developmental (14) perspectives support similar hypotheses.

We considered four health-promoting environmental characteristics. *Low levels of perceived economic stress* involve parents' perceptions of their resources as adequate to meet their needs (15), whereas *adequate income* refers to actual financial resources. Both perceived economic stress and adequate income predict African Americans' parenting practices (16) and adolescent sexual behavior (17). *Community collective efficacy* is the extent to which residents exhibit cohesion, mutual support, and trust; it also involves informal social control of one another's children and adolescents. Collective efficacy has been found to affect directly positive relationships between parents and youth and to buffer parents from the consequences of community disadvantage (18). *Community deviance* includes the prevalence of crime and the extent of environmental disorganization as revealed by abandoned buildings, homes in poor repair, and graffiti. Community deviance covaries with strained family relationships and youth risk behavior (19).

We hypothesized that an accumulation of health-promoting environmental factors during preadolescence would enhance African Americans' provision of nurturant-responsive parenting, which in turn would forecast pregnancy avoidance. According to cumulative models, the influence of one risk or promotive process is limited; however, as youth experience more risk or promotive processes, alteration of developmental pathways becomes more likely (20). Indices composed of promotive or buffering processes predict resilience to victimization (21), reductions in alcohol use (22), and low levels of drug use among youth (23). We therefore hypothesized that African American parents who perceive low levels of economic stress, have per capita incomes greater than 150% of the poverty threshold, and live in communities characterized by high collective efficacy and low deviance levels will engage in more nurturant-responsive parenting. Such parenting includes affectively positive parent-youth interactions, parental attentiveness and responsiveness, and generally supportive behavior; it predicts consistently delayed sexual activity and low levels of risky sexual behavior (24).

Health-promoting environments foster nurturant-responsive parenting characterized by parental support and attentive involvement (11), which signals to youth that the environment is safe and predictable (11, 25). This encourages youth to adopt a long-term, low-risk reproductive strategy (10) that includes long-term planning, positive expectations for the future, and the delay of gratification in the service of future goals. We thus expected African American youth who avoid adolescent pregnancy to report conventional future orientations that include positive expectations for the future, strong school engagement, and negative attitudes toward risky or deviant behavior. These components of conventional orientations are strongly interrelated during adolescence and forecast sexual behavior that is incompatible with adolescent pregnancy (26). Nurturant-responsive African American parents foster these attitudes in their adolescents (27). We expected conventional future orientations to mediate the association of parenting with youths' avoidance of sexual risk behaviors, including intercourse with multiple partners, unprotected intercourse, and intercourse while intoxicated. Avoidance of risk behavior, in turn, is negatively associated with youth reports of pregnancy by late adolescence (28).

To date, research on precocious pregnancy has focused primarily on female adolescents. Recent data, however, suggest that male adolescents experience a number of negative psychosocial consequences when a partner is pregnant, and their young age predicts negatively their involvement with rearing their children (29). Research on male youths' experiences during their partners' pregnancies is scarce. Studies of adolescent risk behavior, however, have identified differences in male and female adolescents' responses to community and family processes (24). We therefore sought to determine whether gender moderated any of the paths in the model presented in Figure 1.

Methods

Participants

Study hypotheses were tested with data from the Family and Community Health Study (FACHS) (18). The baseline sample included 889 African American families in Georgia ($n = 422$) and Iowa ($n = 467$) that included a child 10 to 12 years of age. Families were selected randomly from 259 census block group areas that represented diverse nonurban neighborhoods. Complete data were gathered from 72% of the families on the recruitment lists. Those who declined participation usually cited a lack of time as the reason.

At baseline, 54% of the sample was composed of female youth. Of the primary caregivers, 84% were the youths' biological mothers, 37% of whom were married at baseline. The remaining caregivers were grandmothers (6%), biological fathers (5%), or other adults (5%). The caregivers' mean age was 38 years ($SD = 33.21$), and their educational backgrounds ranged from less than a high school diploma (19%) to a bachelor's or graduate degree (10%); the majority (71%) had a high school diploma. Mean family annual income was \$28,184. The sample was generally representative of African American families in working-class and poor neighborhoods in Iowa and Georgia (18).

Study hypotheses were tested with data from the baseline assessment, a second assessment 5 years later, and a third assessment 8 years after baseline. Youths' mean ages were approximately 11 years at baseline (10.6; $SD = .63$; range 9–13), 16 years at the second assessment (15.7; $SD = .76$; range 14–18), and 19 years at the third assessment (18.8; $SD = .90$; range 16–21). Of the youth who provided data at baseline, 87.6% provided data at age 16, and 86.3% provided data at age 19. Attrition was not associated with participants' demographic characteristics or any study variables.

Procedure

African American research staff made two visits, each lasting 2 hours, to each family's home. During the first baseline visit, self-report questionnaires were administered via an interview conducted privately between one participant and one researcher. Questions appeared in sequence on a laptop computer screen, which both the researcher and participant could see. The researcher read each question aloud and entered the participant's response using the computer keypad.

During the second baseline visit, primary caregivers and youth participated in a 15-minute videotaped interaction task used to obtain observational data on parental behavior; this task has been used previously with African American families (22). The caregiver and youth sat at a table, and the researcher gave them a set of cards on which were printed questions for them to discuss. The questions addressed issues ranging from pleasurable shared activities to the handling of caregiver-youth conflicts and disagreements. Example caregiver-directed questions included, "How do I know what's going on in my child's life, like in school, with friends, or other activities?" Youth-directed questions included, "What are the rules or things my [caregiver] expects me to do or not to do? Which of these are fair and which are unfair?" The researcher instructed the participants to discuss for 15 minutes their answers to each of the questions on the cards. Videotapes were coded using the Iowa Family Interaction Rating Scales (IFIRS) (30). Approximately 25% of the tapes were double coded to estimate interrater reliability. At the age 16 and 19 data collections, only self-report instruments were administered. At each assessment, informed consent/assent was obtained, caregivers received \$100, and youth received \$70. All procedures were approved by the Institutional Review Boards at two universities.

Measures

Pregnancy experience—At age 19, female youth responded yes or no to the question, “Have you ever been pregnant?” and male youth responded yes or no to the question, “Have you ever gotten someone pregnant?”

Environmental factor index—At baseline, an environmental factor index was developed that included four variables: low economic stress, absence of household poverty, high collective efficacy, and low community deviance. Economic stress was assessed with the four-item Unmet Material Needs scale developed for FACHS ($\alpha = .81$); this scale is associated with per capita income and other measures of economic strain (16). An example item was, “How much do you agree with the following statement: ‘*My family has enough money to afford the kind of home we need*’?” Responses ranged from 1 (*strongly agree*) to 4 (*strongly disagree*). Household poverty was calculated using items that assessed typical monthly income from all sources; we then extrapolated these amounts to determine annual household income, which was adjusted for family size (per capita income). The poverty threshold was set at 150% of the poverty limit according to U.S. Health and Human Services 1997 guidelines. The collective efficacy scale (14), to which caregivers responded, comprised 12 questions about informal social control in the neighborhood and community cohesion ($\alpha = .74$). An example item was, “People in your neighborhood can be trusted”; responses were dichotomous (1 = *true*, 2 = *false*). Past studies linked this measure to youths’ affiliations with deviant peers and externalizing problems (19, 31, 32). Caregivers assessed community deviance by responding to four items developed for FACHS concerning deviant behavior in the neighborhood, including drinking in public and gang violence ($\alpha = .89$). In past studies, this scale predicted criminal behavior (19). To create the environmental factor index, families with per capita income above the 150% threshold were coded 1; others were coded 0. For continuous scales, we used median splits to code for low levels of economic distress and community deviance, and high levels of collective efficacy. Families scoring below the median on economic distress or community deviance were assigned a 1 for that factor; families scoring above the median were assigned a 0. Conversely, families scoring below the median on collective efficacy were assigned a 0 and those scoring above the median were assigned a 1. Scores were summed to indicate the number of health-promoting environmental factors present. The environmental factor index ranged from 0 to 4, with a mean of 1.98 ($SD = 1.18$).

Nurturant-responsive parenting—A latent construct was developed using three items from the IFIRS (22): positive affect (caregiver expressions of contentment, happiness, and optimism), relationship quality (observer’s evaluation of the caregiver-youth relationship), and listener responsiveness (caregiver nonverbal and verbal responsiveness in listening to the youth). Ratings on each item could range from 1 (*not at all characteristic*) to 9 (*mainly characteristic*). Intraclass correlations of double-rated tapes indicated adequate reliability: .72 for positive affect and .62 for both relationship quality and listener responsiveness.

Conventional future orientation—A latent construct comprising three scales—future-oriented values, tolerance for deviant behavior, and academic orientation—administered at age 16 was developed. The future-oriented values scale included four questions developed for FACHS that indexed the importance to the respondent of conventional life circumstances in the future (e.g., “How important is it to you to be successful in your work or career?” $\alpha = .82$). The response set ranged from 1 (*not important*) to 5 (*extremely important*). The Tolerance for Deviant Behavior scale (23) included eight items that began with the stem, “How wrong do you think it is for someone your age to ...?” Items addressed substance use, sexual behavior, and conduct problems such as stealing and fighting ($\alpha = .93$). Youth responded on a scale ranging from 1 (*not at all wrong*) to 4 (*very wrong*). The academic

orientation scale, also developed for FACHS, comprised three items (e.g., “You try hard at school”; $\alpha = .67$). Youth reported their attitudes on a scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*).

Risky sexual behavior—Risky sexual behavior was operationalized at age 16 as a latent construct with three youth-reported items. The first item was, “In the last 3 months, how many times have you had sex with [opposite-sex partner]?” This count was positively skewed and subsequently subjected to a logarithmic transformation. The second item was, “In the last 3 months, how many times have you had sex without using a condom (rubber)?” The third item was, “When you have sex, how often do you have some alcohol or drugs beforehand?” Responses ranged from 1 (*never*) to 4 (*most of the time*). Because this item also demonstrated extensive skew, responses were recoded as 0 (*no alcohol or drugs before sex*) or 1 (*any report of substance use before sex*).

Plan of Analysis

The conceptual model was tested with logistic structural equation modeling (SEM) as implemented in Mplus (33), using the full information maximum likelihood (FIML) estimator, which tests hypotheses against all available data. The attrition analyses described previously supported the use of the FIML estimator. We investigated the adequacy of the measurement model with a confirmatory factor analysis. Results predicting the dichotomous pregnancy outcome were expressed in probit regression coefficients, which are interpreted similarly to linear regression parameters. We used Lagrange multipliers to determine whether additional direct paths not included in Figure 1 would significantly improve model fit. Indirect effects were calculated via bootstrapping, and multigroup analyses were used to determine whether gender moderated any of the pathways.

Results

Table 1 presents the correlation matrix, means, and standard deviations for the SEM variables. At age 19, 31% of the participants reported pregnancy experience. A confirmatory analysis of the latent constructs indicated that the measurement model fit the data: $\chi^2(21) = 39.64$, $p = .01$; $\chi^2/df = 1.89$; comparative fit index (CFI) = .98; root mean square error of approximation (RMSEA) = .03 (.02, .05). All factor loadings were significant, $.40$, $p < .01$, and in the expected directions.

Figure 2 presents the results of the final structural model. Lagrange multipliers indicated that inclusion of a direct path between nurturant-responsive parenting and risky sexual behavior would produce a better fit to the data: $\chi^2 = 67.98$, $df = 38$, $p = .002$; $\chi^2/df = 1.79$; RMSEA = .03; CFI = .96. No other additional paths were indicated. Environmental factors were associated with nurturant-responsive parenting, which significantly predicted conventional future orientation and avoidance of risky sexual behavior during midadolescence. Risky sexual behavior in midadolescence predicted pregnancy experience at age 19. Table 2 presents hypothesized mediating processes. Environmental factors, responsive parenting, conventional future orientation, and risky sexual behavior comprised a developmental path linking health-promoting environments with avoidance of adolescent pregnancy. The overall indirect effect linking environmental factors to pregnancy through nurturant-responsive parenting, conventional future orientations, and risky sexual behavior was significant, $p < .03$. Nurturant-responsive parenting significantly mediated the associations of environmental factors with conventional future orientations and risky sexual behavior. Receipt of nurturant-responsive parenting was linked with low levels of risky sexual behavior, in part through conventional future orientations. These orientations were associated with pregnancy

outcomes through inhibition of risky sex in midadolescence. Gender did not moderate any of the model paths.

Discussion

Delaying fertility until adulthood has a profound impact on the course of young people's development; it influences youths' short- and long-term well-being and the likelihood that their offspring will grow up in poverty (28). We tested hypotheses regarding the influence of protective environmental factors on fertility with a sample of African American youth, assessed longitudinally from ages 11 to 19 years. The data supported our hypotheses. During preadolescence, environments in which resources were adequate and communities were cohesive and low in deviance were associated with nurturant-responsive parenting. Such parenting in preadolescence forecast conventional future orientations and avoidance of risky sexual behavior in midadolescence. Youth who refrained from risky sexual behavior in midadolescence were far less likely than those who engaged in it to report pregnancy experience at age 19. Analyses supported an indirect effect model: environmental features → parenting → conventional future orientations → sexual behavior. The total indirect effect of environment on pregnancy through the intervening processes was significant. The significance of all indirect paths among variables in the hypothesized direction and order further supported the indirect effects model. These environmental and family processes were equally important in predicting fertility for male and female youth.

The present study is, to our knowledge, among the first to focus on avoidance of adolescent pregnancy. It extends studies illustrating extensive heterogeneity in community and family environments that African American youth in relatively low-SES contexts experience. Prior studies indicate that collective efficacy and nurturant-responsive parenting can mitigate the effects of difficult environmental conditions on youth development (17). We found that, as families experienced increasing numbers of health-promoting environmental factors, caregivers became more nurturant and responsive, which led to youths' development of conventional future orientations focused on school, accomplishment, and avoidance of deviant behavior. These findings extend the results of other studies involving African Americans in which similar associations emerged using self-reports of caregiving practices (34).

Studies have identified the ways in which nurturant-responsive parenting can reduce the risk for externalizing problems that youth in disadvantaged communities experience, including affiliations with deviant peers (34), antisocial behavior (35), and risky sexual behavior (6). Consistent with these studies, nurturant-responsive parenting in early adolescence forecast avoidance of risky sexual behavior in midadolescence. We identified an interrelated set of attitudes that in part accounted for the effect of nurturant-responsive parenting on risky sexual behavior. Youth who valued future accomplishments, disapproved of antisocial behavior, and engaged in academic pursuits were unlikely to take part in risky sexual behavior. This finding is consistent with research on the association of parenting behavior with youth conventional behavior in general (36) and sexual behavior in particular (24). These studies suggest that youth internalize values and attitudes within the context of warm, supportive interactions with caregivers. This pathway emerged in the present study, as did a direct link between parenting and risky sexual behavior. This suggests that, although parenting was partially mediated through conventional future orientations, other mechanisms also may be involved. For example, peer affiliations may play an important role because nurturant-responsive parenting may influence the types of peers with whom youth affiliate (36). Selection of future-oriented peers both reduces opportunities to engage in early sexual activity and reinforces protective behavior when sexual activity begins.

Several studies have found that, in general, female youths' sexual behavior is more sensitive to environmental and family factors than is male youths' behavior (24, 37). This difference did not emerge in the present study. This unexpected finding may have resulted from two issues. First, a larger sample size might be required to detect significant differences. Second, prior studies tended to focus on risk-promoting, rather than health-promoting, factors. Male and female youth may be equally sensitive to positive contextual factors but differentially responsive to negative factors.

The present findings support an intervention focus on both community and family processes that encourage delayed fertility. Policy initiatives that support collective efficacy and reduce economic distress promote responsive parenting that enhances youth development. Programs that teach nurturant-responsive parenting are also indicated to support conventional future orientations and deter sexual risk behavior. Such changes in youth behavior are known to stabilize through cumulative continuity mechanisms (38). As parents make changes in their relationships with their youth and observe youths' development of conventional attitudes and behavior, the parents' behavior is reinforced, producing a stable family context.

Although the present study's strengths include use of longitudinal data spanning late childhood through late adolescence and a multimethod, multireporter measurement strategy, limitations and caveats must be noted. First, the present model is not intended to be exhaustive; models that include other parameters could also account for variation in the outcome assessments. As noted previously, future studies could include measures of peer affiliation, which may account for additional mediation of risky sexual behavior. Biological parameters can also be explored. Pubertal timing may play a role in the link between family relationships and reproductive strategy in adolescence (9). This could be particularly relevant for female youth. Second, although the design is longitudinal, environmental factors and nurturant-responsive parenting were both measured at baseline, and conventional future orientation and risky sexual behavior were both assessed at midadolescence. This limits assertions regarding the timing and causal status of these variables' influences. The health-promoting environment index used several continuous variables that have no clear cutoff points that indicate a threshold value for a promotive influence. This limitation is offset, though, by the conservative cut point used (median split), which tends to reduce Type 2 error. The accuracy of young men's reports of their sexual partners' pregnancy status may be limited due to lack of awareness of a pregnancy. Finally, the results pertain to African American youth and may not generalize to young people of other races or ethnicities. Nevertheless, the present results identify key processes that policy makers and intervention developers can target to prevent adolescent pregnancy.

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Implications and Contribution

This study examined antecedents to African American youths' avoidance of early pregnancy. Protective processes in community and family environments encouraged adolescents to focus on the future and on academic success, which reduced their involvement in risky sexual behavior and risk for early pregnancy.

Figure 1.
Conceptual model.

Figure 2.

Final logistic structural equation model. All parameters presented are significant at $p < .01$.

Table 1

Descriptive Statistics and Correlations for Study Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Pregnancy experience	–											
2. Environment index	–.08*	–										
Nurturant-Responsive Parenting												
3. Positive affect	–.09*	.13**	–									
4. Relationship quality	–.11**	.17**	.58**	–								
5. Listener responsiveness	–.09*	.13**	.41**	.46**	–							
Conventional future orientation												
6. Future-oriented values	–.01	.04	.13**	.10**	.06	–						
7. Tolerance for deviant behavior	–.13**	.01	.07	.12**	.05	.11**	–					
8. Academic orientation	.05	.10**	.13**	.12**	.04	.30**	.20**	–				
Risky sexual behavior												
9. Intercourse frequency	.24**	–.03	–.10*	–.15**	–.12**	–.06	–.23**	–.12**	–			
10. Unprotected intercourse	.15**	–.01	–.08*	–.02	–.05	–.04	–.07	–.08*	.29**	–		
11. Substance use before sex	.12**	.02	–.07	–.10**	–.10**	–.08*	–.21**	–.11**	.36**	.13**	–	
12. State (1 = Georgia)	–.09**	.03	–.09*	–.10**	–.19**	–.03	.03	.12**	–.04	–.11**	–.10**	–
<i>M</i>	0.31	1.98	5.81	5.87	5.64	18.65	29.27	10.03	–0.85	0.77	1.08	0.47
<i>SD</i>	0.46	1.18	1.75	1.81	1.73	1.94	4.73	1.51	1.90	5.20	0.27	0.50
<i>Range</i>	0–1	0–4	1–9	1–9	1–9	8–20	8–32	4–12	–2.30–4.35	0–77	1–2	0–1

*
p .05.**
p .01.

Table 2

Indirect Effects

Predictors	Mediator(s)	Outcomes	Indirect Effect [95% CI]	p value
Health-promoting environment	Responsive parenting Conventional future orientation	Ever pregnant	-.007 [-.033, -.005]	.010
Health-promoting environment	Responsive parenting	Conventional future orientation	.047 [.020, .075]	.001
Health-promoting environment	Responsive parenting	Risky sex	-.052 [-.086, -.017]	.003
Responsive parenting	Conventional future orientation	Risky sex	-.107 [-.174, -.041]	.002
Conventional future orientation	Risky sex	Ever pregnant	-.150 [-.258, -.042]	.006

CI = confidence interval.