

Maternal Correlates of Adolescent Sexual and Contraceptive Behavior

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Maternal disapproval of premarital sex, maternal discussions about birth control and the quality of the parent-child relationship may have an important influence on adolescents' sexual activity and the consistency of their contraceptive use. Findings from a survey of 751 black youths showed that adolescent perceptions of maternal disapproval of premarital sex and satisfaction with the mother-child relationship were significantly related to abstinence from adolescent sexual activity and to less-frequent sexual intercourse and more consistent use of contraceptives among sexually active youths. Teenagers who reported a low level of satisfaction with their mother were more than twice as likely as those highly satisfied with their relationship to be having sexual intercourse. Discussions about birth control were associated with an increased likelihood that adolescents were sexually active. Such discussions were not significantly related to consistent contraceptive use for female adolescents, but were associated with increased contraceptive use for male teenagers.

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There have been numerous social psychological studies of the relationship between familial variables and adolescent sexual behavior. In general, this research has examined two broad areas: the nature and extent of parent-adolescent communication about sex and birth control and the influence that parents have on adolescent sexual behavior. Most summaries of this literature conclude that the evidence is equivocal regarding the impact of parents on adolescent sexual behavior.¹ Recent studies, however, have found fairly consistent associations between parental variables and sexual behavior among teenage youths. For example, several investigations have found a relationship between parental supervision and adolescent sexual behavior.² Parents who exercise low levels of supervision over the dating activities of their adolescents are more likely to have adolescents who engage in sexual risk behavior.³ Other studies have observed relationships between the style of parent-child communication and the sexual activity and contraceptive behavior of the adolescent.⁴ Although conflicting results remain across studies, it is evident from past research, as

well as from more recent empirical endeavors, that familial variables can be useful predictors of adolescent sexual behavior in a number of contexts.

In this article, we focus on adolescents and their mothers and three familial variables likely to influence adolescent sexual behavior: maternal disapproval of premarital sex; maternal discussions of birth control; and the quality of the parent-child relationship.

Parental Variables

Attitudes Towards Premarital Sex

Studies of parental influences on adolescent sexual behavior often have not examined variance in parental attitudes toward premarital sex, and thereby have implicitly assumed that parents are uniformly opposed to premarital sexual intercourse on the part of their teenage children. However, there are data that call this assumption into question.⁵ Some parents believe that sexual activity on the part of their teenage children is permissible as long as it is done responsibly, on a limited basis and with someone who is special.

In one study, parent-adolescent communication about sex was related to lower levels of adolescent sexual behavior for young women from more traditional families but not for those from less traditional families.⁶ Another study found that general parental attitudes toward premarital sex were predictive of adolescent premarital sexual attitudes, which were in turn related to adolescent sexual behav-

ior.⁷ These studies used general parental attitudes as predictors of sexual behavior rather than specific attitudes focused on parental orientations toward their own child engaging in premarital sexual intercourse. Research in social psychology,⁸ however, suggests that behavior-specific attitudes should be more predictive of behavior than such global attitudes. Studies that have used measures focused on parents' attitudes toward their own adolescent have found parental disapproval to be related to adolescent sexual activity⁹ and contraceptive use.¹⁰ The importance of parental approval in an adolescent's decision to use birth control or to engage in sex also has been reported in several other investigations.¹¹

Taken together, these studies suggest that parental attitudes toward premarital sexual intercourse may influence the sexual activity and contraceptive behavior of adolescents. Studies that have failed to observe a relationship between parental variables and adolescent sexual behavior often have not adequately measured such attitudes.

Discussions About Birth Control

The appropriateness of discussing birth control with young, unmarried adolescents has received increased attention in the popular press and has been most controversial in regard to school-based sex education and the availability of family planning services. Critics have argued that discussions about birth control encourage adolescents to be sexually active by implicitly sanctioning sex and by removing the threat of an unintended pregnancy. Some also object to the discussion of birth control on moral or religious grounds.

Advocates of birth control discussions tend to emphasize the importance of encouraging abstinence, but also stress the need to provide information about the use of birth control so as to encourage protected sex if intercourse occurs. The sex drive of the typical 15- or 16-year-old is about as strong as it will be over the course of a lifetime.¹² Given that marriage typically occurs at least 10 years beyond the onset of menarche and that within this time period adolescents are confronted with pervasive sexual imagery,¹³ it is sim-

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ply unrealistic to expect abstinence on a widespread basis. By denying information about effective contraceptive use, programs and policies that solely emphasize abstinence may actually increase the likelihood of an unintended pregnancy.

The literature on parent-adolescent communication about birth control and adolescent sexual behavior suggests that the relationship between these variables is complex; the impact on behavior varies with the context and nature of the discussions. Overall, findings are equivocal as to the relationship between these variables.¹⁴

Relationship Quality

Adolescent sexual behavior has been linked with qualitative aspects of the family environment. For example, several studies have found pregnancy risk to be associated with variables such as family stress, family conflict and family cohesion.¹⁵ Other studies have observed a relationship between sexual activity and the quality of the parent-adolescent relationship.¹⁶ We expect that the quality of the parent-child relationship will also affect how strongly parental orientations toward premarital sex affect adolescent sexual behavior. Specifically, the more positive the relationship between parent and child, the greater should be the influence of parental attitudes on adolescent behavior.

In this article, we explore the extent to which perceived maternal disapproval of premarital sexual intercourse is associated with the sexual activity and contraceptive behavior of an inner-city sample of black youths between the ages of 14 and 17. Additionally, we address the issue of causal direction in the associations between these variables: Do mothers who disapprove of premarital sex discourage their adolescent children from engaging in sex, or do mothers simply become less disapproving of sex when they discover that their children are sexually active? Another purpose of the research is to examine the relationship between the extent of parent-adolescent discussions about birth control and the sexual and contraceptive

behavior of adolescents. Finally, we explore the relationship between adolescent satisfaction with the maternal relationship and sexual behavior, as well as how such satisfaction alters the association between maternal attitudes toward premarital sex and adolescent sexual behavior.

Method

Procedures

We identified potential study respondents through a systematic random area sampling of households in Philadelphia County using the 1990 Census Public Law tapes for blacks, 12–14 years of age.* A household qualified for the study if an unmarried 14–17-year-old resided in the household, a mother or female caretaker resided in the household, the youth’s biological mother was black and the mother or female caretaker signed a consent form giving permission to interview the teenager if the teenager chose to participate. The sampling frame was stratified so as to yield an approximately equal number of male and female adolescents. Eighty-four percent of those who were invited to be in the study agreed to participate. The most frequently mentioned reason for refusal was lack of time. Adult women were compensated \$15 and teenagers were compensated \$10 for their participation. Data were collected over a five-month period, from March to July 1993.

The adolescents and their mothers were interviewed separately at home (i.e., mothers were not present when the adolescent completed his or her interview, and vice versa). All participants were ensured that their responses were confidential. Almost all of the data were obtained through self-administered questionnaires. If a respondent could not read, the interviewer read the questions aloud and asked the respondent to record the answers in his or her own booklet. Thirteen percent of the teenagers and 12% of the adult women participated under these conditions. If the respondent was unable to read and write, the interviewer asked the questions and recorded the respondent’s answers. Six percent of the adolescents and 12% of the adult women participated in this manner.

Measures

The measures were obtained from a more detailed interview on family influences on adolescent sexual behavior.¹⁷ All respondents were first provided with sample items using response scales from the main interview and were asked to complete the practice items, both in order to eliminate

Table 1. Percentage of male and female black adolescents aged 14–17 who were sexually active, by age, Philadelphia, 1993 (N=745)

Age	Total		Females		Males	
	%	N	%	N	%	N
14	36	115	26	53	43	62
15	54	273	43	140	64	133
16	65	223	63	110	67	113
17	74	134	64	69	85	65

warm-up effects and to detect any misunderstandings. All items had been pretested extensively with a small, representative adolescent sample.[†]

• *Adolescent sexual behavior.* Adolescents were asked whether they had ever had sexual intercourse, and parents were asked if they thought that their teenage child had ever had sexual intercourse. Sexually active adolescents were asked how many times in the last six months they had engaged in sexual intercourse. These measures have been used in previous studies and found to have excellent reliability and validity.¹⁸

Among adolescents who had been sexually active in the past six months, consistency of contraceptive use was assessed with the following item: “When you had intercourse during the past six months, how much of the time, if ever, did you and your partner use any birth control (for example, the pill, a condom, etc.) so that you wouldn’t get pregnant?” Participants were then asked to give their response using a six-point scale as follows: six indicated “always” (100% of the time), five “most of the time” (71% to 99% of the time), four “often” (51% to 70% of the time), three “sometimes” (31% to 50% of the time), two “occasionally” (1% to 30% of the time), and one “never” (0% of the time). Questions similar to these have been used in previous research and have been found to be predictive of future unintended pregnancy¹⁹ and to have high test-retest reliability.²⁰ In addition, the items have been consistently uncorrelated with measures of social desirability,²¹ as was the case in the present data.

• *Attitudes toward premarital sex.* Mothers’ attitudes toward premarital sex were measured using a five-item scale in a five-point agree-disagree format. Measures were obtained separately from the adolescents and their mothers. The scale consisted of the following items (phrased here for the adolescents): “My mother would disapprove of my having sex at this time in my life”; “My mother thinks it is fine for me to be sexually active (having sexual intercourse) at this time in my life”; “My mother thinks I definitely should not be sexually active (having sexual intercourse) at this time in my life”; “If it was with

*The sampling frame was developed and applied by the Institute for Survey Research at Temple University. Details of the sampling strategy are available upon request.

†All items were first reviewed by at least three experts in the field of black adolescent sexual behavior to ensure their relevance and the appropriate use of language. The items were then reviewed by a sample of 30 adolescents representative of the study population. These adolescents provided feedback as to item relevance, item simplicity and use of appropriate language. Finally, all items were reviewed and refined based on feedback by the interviewing team that conducted the initial interviews and were experienced in working with black adolescents.

someone who was special to me and who I knew well, like a steady boyfriend, my mother would not mind if I had sexual intercourse"; and "My mother has specifically told me not to have sex." For the adult women, phrasing was adjusted to appropriately focus the item on the adolescent (e.g., "I have specifically told my daughter not to have sex").

Each item was scored from one to five, with higher scores indicating greater perceived disapproval on the part of the mother. We obtained an overall measure of maternal opposition to premarital sex by averaging the scores across the five items. Coefficient alpha was .75 for the adolescent scale and .60 for the adult version. Only the measure of adolescent perception of maternal disapproval was used in the data analyses.

• *Discussions about birth control.* Three statements assessed the extent of parent-child discussions about birth control. Adolescents were asked "How much has your mother talked to you about each of the following topics?" This was followed by three statements: "We have talked about birth control, in general"; "We have talked about the importance of using birth control"; and "We have talked about specific birth control methods." The items were scored on a four-point scale, with one representing "not at all", two "somewhat", three "a moderate amount" and four "a great deal." Responses to the three items were summed to yield a total score. Coefficient alpha for the measure was .89.

• *Satisfaction with relationship.* We measured satisfaction with the parent-child relationship using an 11-item scale that has been employed in past research.²² Adolescents indicated the extent to which they were satisfied with a wide range of relationship variables, such as general communication, affection, emotional support, discipline, conflict resolution, respect, and shared time and interests.* Items were scored on a five-point scale, with higher scores indicating greater satisfaction. The overall satisfaction score was the average of the 11 items. Coefficient alpha for the measures with the current sample was .90.

Sample Characteristics

A total of 751 never-married black adolescents aged 14–17 and their mothers or caretakers participated in the study. The mean age of the adolescent sample was 15; 15% of the respondents were 14 years old, 37% were 15 years old, 30% were 16 years old and 18% were 17 years old. Eighty-five percent of the youths were living with their biological mother and identified her

as their primary female caretaker; 6% were living with their grandmother and identified her as their primary female caretaker. The remaining 9% were living with some other relative or friend of the family. Forty-four percent of the youths said they were raised as Baptist and 7% said they were raised as Catholic; the remaining youths were distributed across a wide range of religious affiliations, none of

which represented more than 5% of the sample. Ninety-four percent of the adolescents were currently in school; 11% had not yet completed the eighth grade.

The mean age of the adult women was 40. Twenty-three percent of the women had less than a high school education, 30% had a high school degree, 22% had some college education and 25% had either a junior college or college degree. Twenty-four percent of the adults were married and living with their husbands and 15% were "living with a male partner the way you would live with a husband." Twenty-six percent were single (never-married), 14% were separated, 17% were divorced, and 7% were widowed. Forty-eight percent of the women were employed full-time, 14% were employed part-time, 28% were unemployed and 8% were on disability. The median annual family income was approximately \$16,000. Half of the adult women in the sample were Baptist and 8% were Catholic. On average, women in the sample had raised 3.5 children.

Adolescent Sexual Behavior

Fifty-seven percent of the adolescents had engaged in sexual intercourse—65% of the males and 50% of the females. The percentage of adolescents who had engaged in sexual intercourse increased with age (see Table 1). Adolescents who had engaged in sexual intercourse reported a median of six acts of sexual intercourse in the past six months. This was fairly constant across age-groups, except among 17-year-olds, who reported a median of seven acts of intercourse.

Unprotected intercourse was common. Fifty-eight percent of the sexually active adolescents (68% of males and 47% of females) reported having used no contraceptive method at first intercourse. Forty-seven percent reported at least one

Table 2. Percentage distribution of mothers' responses to selected questions assessing attitudes toward premarital sex, by gender of adolescent

Response	Mothers of females (N=368)					Mothers of males (N=372)				
	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5
Strongly disagree	14	74	86	22	13	12	61	76	18	19
Moderately disagree	2	7	5	3	6	4	11	10	4	10
Neither	7	12	6	8	15	9	16	8	10	25
Moderately agree	8	4	1	6	14	15	4	2	10	12
Strongly agree	69	3	3	61	51	61	8	4	58	35
Total	100	100	100	100	100	100	100	100	100	100

Note: Q1—I disapprove of my (son/daughter) having sexual intercourse at this time in (his/her) life; Q2—if it was with someone who was special to (him/her) and who (he/she) knew well, like a steady (boyfriend/girlfriend), I would not mind if my (son/daughter) had sexual intercourse; Q3—I think it is fine for my (son/daughter) to be sexually active (having sexual intercourse) at this time in (his/her) life; Q4—I think my (son/daughter) definitely should not be sexually active (having sexual intercourse) at this time in (his/her) life; and Q5—I have specifically told my (son/daughter) not to have sex.

instance of unprotected intercourse in the past six months; 28% reported practicing contraception at fewer than half of their acts of sexual intercourse, and 14% indicated that they never did so. Thirteen percent of the females reported that they had experienced a pregnancy, and 8% of the males reported having caused a pregnancy. Consistency of contraceptive use over the past six months was relatively uncorrelated with amount of sexual activity.

Sixty-six percent of the mothers believed that their adolescent had not engaged in sexual intercourse, whereas this was actually the case for only 42% of the adolescent sample. Of those adolescents who had engaged in sexual intercourse, 47% of their mothers thought that they had not yet done so. These data are consistent with other studies that suggest that parents tend to underestimate the sexual activity of their children.²³

Parental Attitudes Toward Premarital Sex

Table 2 presents distributions of mothers' responses to the questions assessing their attitudes toward premarital sex. Although the majority of mothers expressed opposition to premarital sexual intercourse on the part of their adolescent, approximately 25% registered ambivalence or a positive attitude. The correlation between an

*The relationship satisfaction scale consisted of the following items: I am satisfied with the way my mother and I communicate with each other; I am satisfied with the love and affection my mother shows me; I am satisfied with the emotional support my mother gives me; I am satisfied with how many things my mother and I have in common; I am satisfied with the household responsibilities my mother gives me; I am satisfied with the way my mother disciplines me; I am satisfied with the amount of time my mother and I spend together; I am satisfied with the way my mother and I resolve conflicts; I am satisfied with the respect my mother shows me; I am satisfied with the fun my mother and I have together; I am satisfied with my relationship with my mother.

Table 3. Logistic coefficients, standard errors and odds ratios (at low and high values) showing effects of selected variables on initiation of sexual intercourse

Variable	Logistic coefficient	Standard error	Odds ratio at low value	Odds ratio at high value
Relationship satisfaction	-0.4069*	.097	2.61	1.02
Maternal disapproval	-0.4437*	.116	2.52	1.05
Discussion about birth control	0.3156*	.094	1.13	2.33
Intercept	0.4875	.105	na	na

* $p < .01$. Note: In this and subsequent tables, na=not applicable.

adolescent's perception of his or her mother's orientation and the mother's self-report of her orientation was .22 ($p < .01$).

Multivariate Analyses

The first step in our analyses involved the identification of potential confounding variables. We assessed a wide range of variables to serve as covariates, including maternal religion, education, religiosity, educational aspirations for the adolescent, employment status, marital status, age, family income and maternal estimates of the sexual activity of their adolescent. Potential adolescent covariates included religion, religiosity, age, gender, whether or not the adolescent was in school, grade in school, educational aspirations and self-reports of peer sexual activity and peer influence. Any variable that was found to be significantly associated with measures of sexual activity or contraceptive use and that added significantly to explained variance over and above other statistically significant covariates was included as a covariate in all of our analyses. The final set of covariates were: age of adolescent, gender of adolescent, religiosity of mother, religiosity of adolescent, whether the adolescent was currently in school, maternal age, maternal perceptions of adolescent

*For all regressions, we conducted an analysis of residual scores to identify outliers and problematic residual patterns (e.g., nonnormality and heteroscedasticity). In each case, we adopted a liberal definition for outlier identification (an absolute standardized residual of two or greater) and compared results that both included and excluded the outliers from the analysis. We report here the results for the analysis that included the outliers, but note any discrepancies in terms of the pattern of significance tests between analyses that included and excluded outliers. Residual analysis focused on identifying model misspecification and heteroscedasticity. Although the residuals were often nonnormal in form (due to the inherent skewness in measures of sexual activity), studies suggest that the analytic methods we employed are reasonably robust to violations of normality (see: J. Kmenta, *Elements of Econometrics*, MacMillan, New York, 1986; and W. Van den Brink, "Robustness of the t Test of the Correlation Coefficient and the Need for Simulation Studies," *British Journal of Mathematical and Statistical Psychology*, 41:251-256, 1988). No major residual problems were identified in the analyses.

sexual activity and adolescents' perception of peer sexual activity.

The analyses reported below used either logistic regression or multiple regression strategies. To facilitate interpretation of the regression coefficients, all predictor variables were mean-centered prior to analysis. Centering was per-

formed prior to the formation of product terms, but not on the product term per se. Preliminary tests and analysis of residuals revealed no problematic cases regarding outliers or model assumptions, except where noted in later discussions.*

Maternal Variables and Sexual Activity

Table 3 summarizes the results of the logistic analysis for the regression of the initiation of sexual intercourse onto the three primary maternal variables of interest (plus the covariates). The adolescent's satisfaction with the mother-child relationship, perceptions of maternal orientation toward premarital sex and report of maternal discussions about birth control were all significant predictors of adolescent sexual activity ($p < .01$). Both relationship satisfaction and maternal attitudes toward premarital sex were inversely associated with the initiation of sexual activity. As adolescent satisfaction with the parent-child relationship increased, the probability that the youth had engaged in sexual intercourse decreased. Similarly, as adolescents' perceptions of mothers' emphasis on abstinence increased, the likelihood that the adolescent had engaged in intercourse decreased. In contrast, as reported discussions about birth control increased, the likelihood that the adolescent had initiated intercourse also increased. Product-term analyses indicated that interaction effects between age and gender and the three core predictor variables were not statistically significant.²⁴

Table 3 also presents odds ratios for engaging in sexual intercourse under two different scenarios: when the predictor variable was set to one standard deviation below its mean and all other variables were set equal to their respective means, and when the predictor was set to one standard deviation above its mean and all other variables were set equal to their respective means. The odds of engaging in sexual intercourse were more than twice as large when relationship satisfaction was "low" as opposed to "high." This was also

true when maternal disapproval was relatively "low" as opposed to "high."

We also calculated the odds ratio of engaging in sexual intercourse under two multivariate scenarios: when relationship satisfaction was one standard deviation above its mean, maternal orientation was one standard deviation above its mean, and discussion of birth control was one standard deviation below its mean (conditions that the logistic analysis suggests will tend to minimize premarital sexual intercourse), and the inverse, when relationship satisfaction was one standard deviation below its mean, maternal orientation was one standard deviation below its mean, and discussion of birth control was one standard deviation above its mean (conditions that the logistic analysis suggests will most encourage sexual intercourse). In both cases, all other predictors were at their mean values.

The odds of engaging in sexual intercourse when the predictors were set to low risk were 0.46 to 1, but when they were set to high risk, the odds were 5.75 to 1. Thus, when relationship satisfaction was high, when the mother was seen as being opposed to premarital sex, and when discussions of birth control were minimal, it was 12.5 times more likely that the adolescent would not engage in sexual intercourse than when relationship satisfaction was low, the mother was seen as more equivocal in her opposition to premarital sex, and the mother had talked to a greater extent about birth control.

Although the logistic analyses indicate statistically significant relationships between the three main predictor variables and adolescent sexual activity, the causal direction is unclear. The negative association between perceived maternal disapproval of premarital sex and initiation of sexual intercourse may reflect the fact that disapproval discourages intercourse or, alternatively, that mothers become more accepting of sexual intercourse when they learn that their teenager is sexually active. If learning about the sexual activity of the adolescent is indeed the primary causal mechanism underlying the association between attitudes and behavior, then it would follow that these two variables should be unrelated when the analysis focuses only on mothers who do not think that their teens are sexually active. Stated in more formal terms, the relationship between maternal disapproval and the initiation of sexual behavior should be statistically nonsignificant when maternal perceptions of adolescent sexual activity are statistically held constant.

This same logic applies to the other maternal variables. The negative association between relationship satisfaction and the initiation of sexual intercourse may occur because a poor relationship with the mother encourages the adolescent to engage in risk behaviors. Alternatively, the negative association between these variables may result from the fact that the quality of the parent-child relationship is negatively affected when the parent learns about (and becomes upset by) the adolescent's sexual activity. This latter reasoning predicts that relationship satisfaction and sexual initiation should be uncorrelated when maternal perceptions of sexual activity are statistically held constant. Finally, the higher levels of sexual activity that are associated with discussions of birth control may simply reflect the fact that a mother is more likely to discuss birth control with her teenager when she learns that he or she is sexually active. If this is the case, then the positive association between birth control discussions and the initiation of sexual behavior should be reduced to nonsignificance when maternal perceptions are statistically held constant.

The coefficients of the logistic regression analysis for all three maternal variables were statistically significant when maternal perceptions of sexual activity were partialled out. These results argue against a causal interpretation that adolescent sexual behavior influences maternal attitudes. These results do not affirm the causal influence of attitudes on behavior, but they do lend support to such an interpretation.

The logistic analysis, however, could be misleading if there is an interaction effect between maternal perception of adolescent sexual behavior and the parenting variable hypothesized to influence behavior. The partial logistic coefficient is essentially a weighted average of the coefficients from the regression of behavior onto the maternal variable at each of the two levels of maternal perceptions ("my teen has engaged in sexual intercourse" versus "my teen has not engaged in sexual intercourse"). A statistically significant interaction effect would imply that the coefficients are discrepant in the two conditions and that "averaging" them is not appropriate. We therefore tested for an interaction effect by including a product term in the equation between the maternal variable and maternal perceptions of sexual activity on the part of their teenage child. In no case did the product term yield a logistic coefficient that was statistically significant.

A second set of interaction analyses fo-

cused on whether the association between perceptions of maternal disapproval and adolescent initiation of sexual behavior became more pronounced as the quality of the parent-child relationship improved. For this analysis, we formed a product term between maternal disapproval and relationship satisfaction and included it in the logistic regression reported in Table 3. The product term yielded a statistically significant negative logistic coefficient (coefficient = $-.251$, $p < .01$, not shown), which was consistent with our hypothesis. We repeated the analysis using a product term between birth control discussions and relationship satisfaction. The logistic coefficient for this product term was not statistically significant.

Frequency of Intercourse

To examine the relationship between maternal variables and frequency of sexual activity, we performed regression analyses focusing only on sexually active youths and using frequency of sexual intercourse in the past six months as the dependent variable. The upper panel of Table 4 presents this portion of the regression equation. Both relationship satisfaction and adolescent perception of maternal disapproval for sexual intercourse yielded statistically significant regression coefficients ($p < .001$ and $p < .01$, respectively); the more satisfied the adolescent was with the parent-child relationship and the more strongly the mother was perceived to have emphasized abstinence, the less frequently the adolescent engaged in sex. The regression coefficient for birth control discussions was not statistically significant. The multiple correlation for prediction of sexual frequency using just the covariates was $.33$ ($p < .01$), whereas the multiple correlation for the covariates and the three additional maternal variables was $.37$ ($p < .01$). Thus, the three maternal variables accounted for about 5% of unique explained variance in sexual frequency.

Inspection of the residuals in the regression analysis suggested several possible interaction effects, but these accounted for small amounts of the variance in the dependent measures. For example, the pattern of residuals suggested a possible interaction effect between gender and the extent of discussion about birth

Table 4. Regression coefficients (and error terms) and t-ratios showing effects of selected variables on frequency of sexual intercourse and on consistency of contraceptive use

Variable	Standard B	t-Ratio	p value
Frequency of intercourse			
Relationship satisfaction	-2.11 (.51)	4.10	<.0001
Maternal disapproval	-1.74 (.66)	2.61	.0094
Discussion about birth control	0.83 (.56)	1.48	.1411
Intercept	5.72 na	na	na
Consistency of use			
Relationship satisfaction	0.174 (.086)	2.02	.0447
Maternal disapproval	0.298 (.112)	2.67	.0081
Discussion about birth control	0.089 (.053)	0.95	.3440
Intercept	3.63 na	na	na

control. We therefore formed product terms to reflect all possible two-way interactions between gender, age and the three maternal predictors and included these in the regression equation. The product term for gender and the extent of birth control discussions was just barely statistically significant ($t = 1.96$, $p < .05$), accounting for about 1% of unique explained variance. The slope for the regression of sexual frequency onto the extent of birth control discussions was -0.44 for girls and 2.19 for boys. Thus, there was a tendency for increased discussions about birth control with boys to be associated with increases in sexual activity. However, this interaction effect was not replicated when more robust analyses were pursued.*

The issue of causal direction for this dependent measure followed the same logic as that for the previous logistic analysis. Because maternal perceptions of adolescent sexual activity were included as a covariate, the competing causal mechanism of behavior influencing attitudes was statistically controlled. Given the statistically significant coefficients, the results are consistent with the proposition that perceptions of maternal disapproval of premarital sex discourage adolescent sexual activity and inconsistent with the reverse proposition that adolescent sexual activity influences maternal disapproval of pre-

*The dependent measure, frequency of sex, was quite skewed, with a small number of adolescents reporting frequency levels that differed sizably from those of the majority of the sample. Although the basic pattern of statistical significance was maintained when outliers were removed, we decided to conduct additional robust analyses. One strategy was to apply the regression equation to rank transformed values of the frequency measure (see W. J. Conover, *Practical Nonparametric Statistics*, Wiley, New York, 1980; and W. J. Conover and R. L. Iman, "Rank Transformations as a Bridge between Parametric and Non-Parametric Statistics," *American Statistician*, 35:124-129, 1981). A second strategy was to induce censoring of the frequency measure by setting all values above 30 to a "ceiling" of 30, so that the highest score that could occur was 30.

marital sex. Similarly, the results are consistent with the proposition that the quality of the parent-child relationship influences adolescent sexual behavior. The analysis of interaction terms between maternal perceptions of adolescent sexual activity and the two statistically significant maternal variables yielded statistically nonsignificant interaction effects.

To test if relationship satisfaction moderated the impact of maternal disapproval and birth control discussions on frequency of sexual intercourse, we added product terms to the regression equation that reflected these (bilinear) interactions. None of the product terms yielded statistically significant regression coefficients.

Maternal Variables and Contraception

The lower panel of Table 4 (page 163) presents the coefficients for the regression analysis of the main maternal predictors (plus the covariates) on consistency of contraceptive use among sexually active adolescents. The regression coefficients for relationship satisfaction and perceptions of maternal disapproval were statistically significant and positive; the more satisfied the adolescent was with the parent-child relationship and the more the adolescent perceived maternal disapproval of sexual activity, the more consistent the teenager was in the use of birth control. The coefficient for the extent of discussions about birth control was not statistically significant. The three maternal variables accounted for about 5% of unique explained variance over and above the covariates (multiple correlation of .27 for the covariates and maternal variables combined versus a multiple correlation of .17 for just the covariates).

Analysis of the residuals again suggested the possibility of weak interaction effects. For example, the two-way interaction between gender and discussions about birth control was suggested by a residual analysis, and this interaction was formally evaluated with product terms. The results showed that the slope of consistency of use on extent of birth control discussions was negligible for girls (-0.13), but statistically significant and positive for boys (0.27, $p < .05$), such that increased discussions tended to be associated with greater consistency of use. The interaction accounted for just less than 1% of the variance in the dependent measure.*

Analysis of interaction effects concerning the issue of causal direction and on

moderating effects of relationship satisfaction yielded statistically nonsignificant coefficients for the relevant product terms.

Discussion

Before discussing the results of the present analysis, we offer several caveats. First, this study was restricted to a single population, namely inner-city black youths living in Philadelphia. Discretion is required in generalizing the results to broader adolescent populations. Second, the study relied on self-reports for the measures of adolescent sexual activity. We took numerous steps to enhance the accuracy of these measures: Respondents recorded their answers to sexual questions so that the interviewer would not see or hear their responses; confidentiality of responses was emphasized during our instructional sets, as was the importance of being honest; we used measures that have been successfully employed in previous research and have been shown to be predictive of unintended pregnancy; finally, we obtained measures of the tendency to provide socially desirable responses and found these to be unrelated to measures of sexual behavior. Thus, we do not believe that the self-report nature of our outcome measures is problematic. Nevertheless, some caution is required in the context of our research conclusions. Additionally, the research was correlational in nature with a cross-sectional design. Causal inferences obviously must be made with care.

Despite these limitations, we believe that there are several important trends in the data. The results are consistent with the view that maternal variables play a role in shaping adolescent sexual behavior. The overall quality of the adolescent's relationship with his or her mother was related to whether the teenager had ever had intercourse, the frequency of sex and the consistency with which birth control was used. This finding is consistent with other research on mother-daughter relationships and adolescent sexual behavior.²⁵

The maternal variables in the multiple regression analyses accounted for approximately 5% of the variance in the frequency of sexual behavior and in the consistency of birth control use, over and above the covariates. Although some may view these as small effects, we believe they are of practical import. Sexual and contraceptive behavior are complex phenomena with multiple determinants, and it is unrealistic to expect to find one or two variables that account for substantial portions of their variability. That our effect

sizes were attenuated by measurement error must also be taken into account. Rosenthal has presented a thoughtful discussion of effect sizes and has shown that small squared correlations can often represent important effects.²⁶

Accordingly, our findings suggest that if adolescents are generally satisfied with their relationship with their mothers, they may be more likely to pay attention to, process and accept information from their mothers about sexual topics. Maternal values, such as those pertaining to responsible behavior, may have a greater impact on adolescents when the quality of the parent-child relationship is positive. Likewise, avoiding a mother's disapproval may be a more powerful motivator in the context of a strong parent-child relationship. By contrast, if the parent-child relationship is a difficult one, it seems unlikely that maternal values would have as much influence. In fact, adolescents may behave in ways that directly oppose their parents if they are unhappy or dissatisfied with the relationship.

Our findings are also consistent with the idea that parents need to be firm in their emphasis on abstinence if they wish to discourage their teenage son or daughter from engaging in sexual intercourse. Perception of maternal disapproval of adolescent sexual behavior not only tended to be associated with less frequent intercourse, but was positively associated with consistent use of birth control. Mothers who discourage sexual activity in their teenage children are likely to do so by emphasizing the negative consequences of an unintended pregnancy. Young people's awareness of these consequences may motivate them to use contraceptives once they become sexually active. By contrast, adolescents may engage in more sex and use birth control less consistently if their mothers take a more permissive attitude toward premarital sex.

We hypothesized that the quality of the parent-child relationship would alter the relationship between maternal disapproval and sexual behavior. This was indeed the case for the initiation of sexual intercourse, but not for the frequency of sex once sex had been initiated or for the consistent use of birth control. First intercourse is probably more significant to an adolescent than are subsequent acts of intercourse. Thus, it may be that maternal disapproval of sexual intercourse is reinforced by a strong parent-child relationship, enhancing the effect on delay of first intercourse. However, once sex has been initiated, the mediating impact of relationship

*When analyzed using rank transformations, the interaction effect was also statistically significant, yielding a comparable pattern of results.

quality on sexual activity may dissipate for subsequent acts of intercourse.

Although our data were correlational in nature, we were able to gain a perspective on the direction of causal influence between the parenting variables and adolescent sexual behavior by including maternal perceptions of adolescent sexual activity as a covariate in the regression analyses. In general, the data were consistent with the hypothesis that maternal variables influence adolescent behavior rather than behavior influencing maternal variables. It is possible, of course, that mechanisms other than those accounted for in this study are mediating the influence of adolescent behavior on the maternal variables.

Many parents are unsure if they should talk with their adolescent children about birth control; they fear that doing so may increase the adolescent's sexual activity. In this study, the relationship between birth control discussions and adolescent sexual activity was complex. Discussions about contraception were associated with an increased probability of first intercourse for both males and females as well as older and younger adolescents. By contrast, among sexually active youths, discussions about birth control were not related to the frequency of sexual intercourse over a six-month period (although a marginally increased frequency among males should be kept in mind in future research). Finally, discussions about birth control had little relationship to the consistency with which contraceptives were used, at least for females; for males, there was a positive association between these variables.

It may be that the kinds of discussions parents have with their teenage daughters lack practical information or present viewpoints that make it difficult for young women to put contraception into proper perspective. Certainly, the wider repertoire of birth control methods that are available for women as opposed to men make these discussions, by definition, more complex (and potentially more confusing) for adolescent girls as opposed to adolescent boys.

It is important to emphasize that the results of our study apply only to discussions about birth control in the context of the family and, in particular, between teenagers and their mothers. Generalizations should not be extended to controversies about sex education programs in schools and clinics. Such programs occur in different contexts and have different structures than that of family-based discussions. More research is needed to fur-

ther elaborate on the findings that maternal discussions about contraception may, on average, hasten the onset of sexual intercourse with minor apparent effects on consistent use of birth control (at least for females). Specifically, the timing of discussions (do they occur before or after the initiation of sexual intercourse) and their actual content need to be addressed before confident inferences can be made.

A substantial percentage of unintended pregnancies occur within the first six months of first intercourse,²⁷ and adolescents delay, on average, a year after first intercourse before they obtain birth control,²⁸ if they do so at all. This underscores the importance of reaching adolescents early, with appropriate educational messages about sex and birth control. We believe that a viable mechanism for doing so is through the family. Such an approach has several advantages. It permits the presentation of information in a context that is consistent with parents' values, and parents can tailor the timing and content of information to the specific life circumstances and personality of their child. Parents can be sensitive to the entire family context (e.g., sibling relationships) and to daily stressors in ways that sex education classes, given their group focus, cannot. Moreover, the content of sex education classes in schools is usually tied to normative developmental changes at defined chronological ages. By contrast, parents can take into account their child's own level of maturity.

We believe that many parents will need education about sex and birth control themselves to help them communicate with their adolescent children more effectively. More research is necessary on parent-based approaches before such interventions can be attempted. Nevertheless, family-based interventions represent an additional tool in the attempt to reduce unintended pregnancies in adolescents. We encourage family planning and health clinics to explore the potential of parent outreach programs.

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