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Maternal Influence on Adolescent Sexual Initiation: Race/Ethnic- and Gender-Specific
Longitudinal Associations

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Abstract

Little is known about how maternal effects on adolescent sexual activity differ across race/ethnicity and gender. This study examined group-specific associations between adolescents' and mothers' reports of mother-child closeness and negative maternal reactions to sex and sexual initiation in the following year. Using Waves I (1994-1995) and II (1996) of the National Longitudinal Study of Adolescent Health, this study analyzed data from White, Black, and Hispanic adolescents aged 15-17 who were virgins at Wave I and whose mothers provided survey data (N=3,130). Results indicated that adolescents' perceptions of mother-child relationship characteristics had stronger effects than did mothers' reports; adolescents who expected negative maternal reactions to sex were less likely to initiate sex. In adjusted analyses, this association only was significant among girls: in the expected direction for White and Hispanic girls and the unexpected direction for Black girls. When implementing sexual risk prevention programs, group differences should be considered.

KEYWORDS: Adolescence, Gender, Mother-Child Relationships, Race/Ethnicity, Sexual Initiation

Recent data indicate that among U.S. high school students, most of whom still reside in their parental home, nearly half (46%) have initiated sexual activity (CDC, 2010). Early sexual initiation is associated with subsequent sexual risk-taking behaviors, such as condom use inconsistency and multiple partnerships, and detrimental outcomes, such as pregnancy and sexually transmitted infections (STIs) (Coker, et al., 1994; Durbin, et al., 1993; Kaestle, Halpern, Miller, & Ford, 2005; McNeely, et al., 2002; O'Donnell, O'Donnell, & Stueve, 2001; Santelli, Brener, Lowry, Bhatt, & Zabin, 1998; Upchurch, et al., 1992). Surveys indicate that parents do not condone early sexual activity (McNeely, et al., 2002; Seiving, McNeely, & Blum, 2000), yet their children engage in it anyway. It is important to document, given changes in sex-related norms over the past few decades, whether parental attitudes and behaviors remain effective in influencing adolescents' rate of sexual initiation.

Although rates of adolescent sexual activity are high among all adolescents, the rates and related risks of sex are not equal across gender, race, and ethnicity. For example, the proportion of boys who initiate sex at a very young age is considerably higher than that of girls (CDC, 2010); perhaps more importantly, boys and girls have one categorically different risk associated with sexual activity – pregnancy. Additionally, many racial and ethnic minorities are at a greater risk of becoming sexually active at a young age than non-minorities; Black and Hispanic high school students, for example, are more likely to be sexually active than their White counterparts (65% and 49% vs. 42%, respectively) and are more likely to initiate sex at a younger age (CDC, 2009). Further, there is evidence that the racial/ethnic gap in sexual activity may be increasing (Eaton, et al, 2006). Despite these inequalities, little research to date has examined the associations of mother-child relationship characteristics with adolescent sexual activity by gender and racial/ethnic sub-population. This represents a critical gap in research, as parenting

practices and sexual socializations practices often differ for boys and girls and across racial/ethnic groups.

The current study examines associations between adolescents' and mothers' reports of mother-child closeness and negative maternal reactions to sex and adolescent sexual initiation within the following year. It examines these associations by gender (boy and girl) and race/ethnicity (White, Black, and Hispanic), thereby exploring variation in the influence of family and background controls on adolescent sexual initiation among these subgroups.

BACKGROUND

Of the numerous individual, relational, peer, community, and societal characteristics known to influence adolescent sexual activity (see DiClemente, Salazar, & Crosby, 2007; Kirby, 2002; Miller, 2002 for reviews), adolescents indicate that parents are the most influential when it comes to making decisions about sex (Albert, 2007). Parental characteristics and parent-child relationships represent key antecedents of sexual risk behavior (Dittus & Jaccard, 2000; Markham, et al., 2010; Miller, 2002; Perrino, Gonzalez-Soldevilla, Pantin, & Szapocznik, 2000), and, specifically, mother-child closeness and maternal disapproval of sexual activity seem to be influential in adolescents' decisions to have sex (Fox, 1981; Miller & Fox, 1987).

Numerous studies have found that high levels of closeness between parents and children are associated with delays in sexual initiation (see Markham, et al., 2010 for a review). Further, it has been demonstrated that family members' – particularly mothers' – expressions of discouragement or disapproval towards sex are critical motivators for abstaining from sex, especially for younger adolescents (McNeely, et al., 2002; Porter, et al., 2004). Additionally, research indicates that, more than mothers' actual disapproval of sexual behavior, adolescents' *expectations* of negative maternal reactions to sex affect sexual risk behaviors – particularly by

delaying sexual initiation (Acock & Bengtson, 1980; Dittus & Jaccard, 2000; Jaccard, Dittus, & Gordon, 1996; Sieving, McNeely, & Blum, 2000). However, most studies that have examined associations between mother-child relationships and adolescent sexual activity have been limited in their predictive ability by using cross-sectional data, by using small, geographically- or racially-limited samples, or by failing to control for confounding variables. Additionally, many of these studies have focused on very early sexual initiation (among adolescents younger than 15) and neglect to examine the factors that influence sexual initiation in later adolescence, a developmental period that still represents a critical time for initiation of risky behaviors. Finally, many of these studies use only adolescents' or mothers' reports of closeness or disapproval of sex and fail to examine the relative importance of these two different perspectives.

Moreover, despite that fact that “parents are significant agents in the sexual socialization of youth” (Somers & Vollmar, 2006, p. 452), studies that have examined adjusted, longitudinal associations between mother-child relationship variables and sexual outcomes (Ream & Savin-Williams, 2005; Sieving, McNeely, & Blum, 2000) have, by and large, neglected to examine how these relationships vary by race, ethnicity, and gender. This represents a gap in the literature for two important reasons. First, mothers sexually socialize boys and girls differently: sons and daughters discuss different sex-related topics with their mothers, sons are less comfortable talking about sex with their mothers than daughters, and mother-child communication about sex tends to be less frequent and less effective for sons than daughters (DiIorio, Kelley, & Hockenberry-Eaton, 1999; McNeely, et al., 2002; Rosenthal & Feldman, 1999; Sneed, 2008). Furthermore, maternal values and mother-child relationship characteristics tend to have stronger effects in delaying sexual initiation for girls than for boys (McNeely, et al., 2002); thus, it is important to examine these associations separately, by gender. Second,

adolescents' behaviors are influenced by parental beliefs and values, as mediated by culture (Goodnow, 1988). Cultural attitudes associated with various racial/ethnic groups have important implications for how a mother sexually socializes her children; for example, certain racial or ethnic subpopulations may consider adolescent sexual activity – or the outcomes associated with sexual activity, such as pregnancy – less upsetting than others. Therefore, the effects of mother-child relationships should also be examined within the cultural context of race and ethnicity (Collins, 1994).

Theory

This study uses rational choice theory to describe the processes underlying adolescent sexual initiation. Rational choice suggests that people make decisions based upon enhancement of benefits and reduction of costs. It is assumed that perceived benefits – physical pleasure and social or relational acceptance, for example – underlie the decision to initiate sexual activity. It also is assumed that individuals weigh those perceived benefits against perceived costs; for example, adolescents may consider the cost of pregnancy or STIs when deciding to initiate sex. However, it has been posited that the latter are not deterrents for teens (Ott, et al., 2004); that adolescents may give more weight to the present – and to immediate gratification – than to future costs (Kearney & Levine, 2007; O'Donahue & Rabin, 1999).

For costs to have enough relative weight compared to perceived benefits, the perceived costs of sexual initiation must be salient and tangible. The future costs of sexual behavior may not represent tangible or conceivable risks to adolescents, however, mothers' negative reactions to adolescents' sexual activity are concrete and perceptible and, thus, may significantly impact adolescents' decisions to initiate sex. It can be expected, then, that mothers' negative reactions to sex (either real or perceived) represent significant costs to adolescents, thus resulting in a

delay of their sexual initiation. It must be noted, though, that how a mother sexually socializes her child likely will affect her disapproval of sex (or by child's expectation of her disapproval) – and sexual socialization may be influenced by a child's gender or racial/ethnic identity.

Rational choice theory also can elucidate the link between parent-child closeness and delay of sexual initiation. It is posited that adolescents who are close to their mothers are less likely to engage in an activity that might threaten the quality of that relationship, and the perceived cost of losing a close relationship with one's mother might cause an adolescent to delay sex. Again, this assertion must be considered in the context of cultural variations in mother-child relationships. For example, certain racial or ethnic groups – especially those that are typically matriarchal or are more likely to comprise female-headed households – might report higher levels of mother-child closeness than other groups. Moreover, the context of gender must be considered when examining the role of mother-child relationship quality, as adolescents tend to identify with and report higher levels of closeness with their same-sex parent (Starrels, 1994); mothers may have a particularly important effect on daughters, compared to sons.

The current study used the National Longitudinal Study of Adolescent Health (Add Health) to measure longitudinal associations between adolescents' and mothers' reports of mother-child closeness and negative maternal reactions to sex and later adolescent sexual initiation for gender and racial/ethnic (White, Black and Hispanic) subgroups.

Hypotheses

The study was guided by four hypotheses. First, it was hypothesized that both higher levels of negative maternal reactions to sex and higher levels of mother child closeness would be associated with a delay in sexual initiation among all adolescents. Second, it was hypothesized that of these two mother-child relationship characteristics, negative maternal reactions would

have greater effects on delaying sexual initiation, as these reactions represent clear sanctions or costs. Third, it was hypothesized that the magnitude of associations between the two mother-child relationship characteristics would vary between sub-populations. In particular, it was posited that these characteristics would have stronger, more consistent effects in delaying sexual initiation among girls, the subgroup most likely to be affected by mothers, and especially among black girls, because this subgroup represents a subgroup that often resides in single-mother households with particularly close mother-child relationships.

METHODS

Data

Add Health is a longitudinal study of a nationally representative sample of U.S. adolescents who were in grades 7-12 during the 1994-1995 school year. Add Health data are appropriate for the current study because Wave I data were collected from both adolescents and one of their parents (usually a mother) and include responses regarding relationships and sexual behaviors; Wave II data were collected from the same adolescents one year later. As such, Add Health data can be used to examine how family relationships affect adolescent sexual initiation.

Participants

The current study used Add Health data from Waves I (1994-1995; N=20,745) and II (1996; N=14,738) that had valid Wave II weight, strata, and cluster variables (N=13,570). The analytic sample included only adolescents who had not initiated sex at Wave I (N=8,763) and whose mothers completed the parent survey (N=7,031). The sample included only White (non-Hispanic), Black (non-Hispanic), and Hispanic adolescents (N=6,556). Additionally, only those who were 15, 16, or 17 years old at Wave I were included (N=3,405), since some questions regarding sexual activity were asked only to respondents 15 years or older, and since those who

were 18 and older at Wave I were already adults. Only cases with no missing data on the independent variables (N=3,130) were used.

Independent Variables (Wave I)

Mother-child closeness (adolescent report). This variable was assessed by asking: *“How close do you feel to your [mother/adoptive mother/stepmother/foster mother/etc.]?”* Responses were coded on a 1 - 5 scale; high scores indicated a close mother-child relationship.

Negative maternal reaction to sex (adolescent report). This variable was assessed by asking: *“If you had sexual intercourse, it would upset [name of mother].”* Responses were coded on a 1 - 5 scale; high scores indicated that it would upset one’s mother to have sex.

Mother-child closeness (mother report). This variable was assessed by asking the mother how often this statement was true: *“You get along well with (him/her).”* Responses were coded on a 1 - 5 scale; high scores indicated a close mother-child relationship.

Negative maternal reaction to sex (mother report). This variable was assessed by asking the mother how much she agreed with this statement: *“You disapprove of {NAME}’s having sexual intercourse at this time in (his/her) life.”* Responses were coded on a 1 - 5 scale; high scores indicated that it would upset the mother if her child had sex.

Confounding Variables (Wave I)

Age. Adolescent’s age was calculated by subtracting birth month and year from the interview date. Responses were dummy-coded as age 17, 16, and 15 (the referent).

Good grades. Grades were determined by asking: *“At the most recent grading period, what was your grade in each of the following subjects: English/Language Arts, Mathematics, History/Social Studies, and Science?”* Responses were summed and averaged, and respondents were coded as having “good grades” if they reported mainly A’s and B’s or having “bad grades”

if the mainly reported C's and below (the referent).

Maternal education. Maternal education was based on maternal response to the question: *"How far did you go in school?"* if she provided a valid response, otherwise by adolescent's report of maternal education. Responses were dummy-coded "more than high school," "high school," or "less than a high school education" (the referent).

Household low functional income. This variable was determined by maternal response to the questions: *"Do you have enough money to pay your bills?"* and *"Last month, did you or any member of your household receive a housing subsidy or public housing?"* Individuals with difficulty paying bills or who received housing assistance were coded as having a "low functional income;" those who did not were coded as "no low functional income" (the referent).

Religiosity. Adolescent's religiosity was assessed by asking if an adolescent was religious, then asking: *"In the past 12 months, how often did you attend religious services? How important is religion to you? How often do you pray?"* Responses to the latter questions were summed and averaged. Individuals who prayed and attended services very often and who reported that religion was very important were dummy-coded as "very religious;" otherwise they were dummy-coded as "somewhat religious." Those that reported that they were not religious were dummy-coded as "not religious" (the referent).

Delinquency. Delinquency was based on 15 questions: *"In the past 12 months, how often did you lie to your parents or guardians about where you had been or whom you were with? Take something from a store without paying for it? Run away from home? Drive a car without its owner's permission? Steal something worth more than \$50? Go into a house or building to steal something? Steal something worth less than \$50? Act loud, rowdy, or unruly in a public place?"* Respondents that had committed more than three acts were dummy coded as "very delinquent;"

those than had committed one to three were dummy coded as “moderately delinquent;” those that had committed zero acts were dummy coded as “not delinquent” (the referent).

Household structure. This variable was based on adolescent report of household roster. If both a mother and father were identified, they were coded as having a “mother and father household.” If they only identified a mother or a father, or did not identify either, they were coded as “not having a mother and father household” (the referent).

Dependent Variable (Wave II)

Sexual initiation. Sexual initiation was determined by asking: “*Have you ever had sexual intercourse? When we say sexual intercourse, we mean when a male inserts his penis into a female’s vagina.*” Responses were coded as “yes” or “no” (the referent).

Procedures

Weighted Wave I sociodemographic characteristics and Wave II sexual initiation were estimated and compared by race/ethnicity using t-tests. Means and standard deviations were estimated for both adolescents’ and mothers’ reports of mother-child closeness and maternal disapproval of sex and were compared by race/ethnicity using t-tests.

Logistic regression was used to estimate odds ratios (ORs) and 95% confidence intervals (CIs) for the associations between adolescents’ Wave I reports of mother-child closeness and of perceived negative maternal reactions to sex and Wave II sexual initiation. The same method was used to estimate associations between mothers’ Wave I reports of mother-child closeness and of negative reactions to sex and Wave II sexual initiation. Logistic regression also was used to estimate ORs and 95% CIs for the associations between both adolescents’ and mothers’ reports of mother-child closeness and maternal disapproval of sex and sexual initiation. This method was used to assess unadjusted and adjusted (controlling for confounders) associations for

the total sample and for boys and girls individually; additionally, this method was used to assess associations for the various gender and race/ethnic subgroups (White boys, Black boys, Hispanic boys, White girls, Black girls, and Hispanic girls).

Analyses were run using SAS Version 9.2. The complex survey design of the data set was incorporated by using survey commands to account for stratification, clustering, and unequal selection probabilities. Ethical approval for this research was obtained from the University of Maryland, College Park Institutional Review Board.

RESULTS

Wave I Sociodemographic Characteristics

Total sample. The analytic sample was 78% White, 9% Black, and 13% Hispanic (weighted; not shown). Given that this sample had not initiated sex at Wave I, it contained more younger than older adolescents (46% were aged 15) (Table 1). Slightly more than half of the sample were girls (53%), had a mother with more than a high school education (54%) and had good grades (54%). Most lived with both a mother and father (77% vs. 23%) that did not have a low functional income (90% vs. 11%). Most were at least somewhat religious (90%) and had engaged in at least one delinquent activity in the prior year (77%).

(Table 1 about here)

Race/ethnic groups. Comparing Whites, Blacks, and Hispanics, there were no significant differences in respondent age; however, compared to White adolescents (the referent), there were more girls among the Black and Hispanic respondents (Table 1). Blacks and Hispanics were less likely than Whites to report getting good grades (38% and 40% vs. 58%). Hispanics were less likely than Whites to not be religious (5% vs. 11%), and Blacks were more likely than Whites to be very religious (58% vs. 37%). Hispanics were more likely than

Whites to report very delinquent behavior, but less likely to report moderately delinquent behavior. Blacks and Hispanics were more likely than Whites to have a mother with less than a high school education (18% and 49% vs. 9%) and were less likely to have a mother with more than a high school education (48% and 31% vs. 58%). Both Blacks and Hispanics were less likely than Whites to be living with both a mother and father (49% and 74% vs. 81%).

Mother-Child Relationship Characteristics

Total sample. Overall, adolescents reported high closeness with their mothers (mean = 4.56) and high expectations of negative maternal reactions to sex (mean = 4.32) (Table 2). Mothers also reported high closeness and high negative reactions to sex, though slightly lower than their children on closeness (mean = 4.30) and slightly higher than their children on negative reactions to sex (means = 4.51).

(Table 2 about here)

Race/ethnic groups. Comparing racial/ethnic groups, both Black and Hispanic adolescents reported higher levels of mother-child closeness than White adolescents (Table 2). Black and White adolescents did not differ in their expectations of negative maternal reactions to sex, but Hispanic adolescents reported significantly lower expectations of negative reactions to sex than White adolescents. Both Black and Hispanic mothers reported significantly higher levels of closeness to their children and significantly lower negative reactions to sex than White mothers.

Sexual Initiation

By Wave II, 23% of the total sample had initiated sexual activity (Table 1). Comparing racial/ethnic groups, Blacks were more likely than Whites to initiate sex (33% vs. 23%), but there was not a significant difference between Hispanics and Whites (21% vs. 23%).

Multivariate Associations: Sexual Initiation, Total Sample

Adolescents' reports. Unadjusted analyses examining adolescents' reports indicated that adolescents were less likely to initiate sex by Wave II if they reported higher levels of mother-child closeness (OR: 0.84, 95% CI: 0.73-0.96) and if they reported greater expectations of negative maternal reactions to sex (OR: 0.72, 95% CI: 0.64-0.80) (Table 3, Model 1).

(Table 3 about here).

Mothers' reports. Unadjusted analyses examining mothers' reports indicated that higher levels of negative maternal reactions to sex were associated with a decreased likelihood of adolescents' sexual initiation (OR: 0.87, 95% CI: 0.80-0.94) (Table 3, Model 2). However, mothers' reports of mother-child closeness were not associated with subsequent sexual initiation.

Adolescents' and mothers' reports. In analyses examining both adolescents' and mothers' reports, adolescents' report of mother-child closeness remained significantly associated with sexual initiation (OR: 0.84, 95% CI: 0.73-0.97) as did adolescents' expectations of negative maternal reactions to sex (OR: 0.73, 95% CI: 0.65-0.82) (Table 3, Model 3). Mothers' report of mother-child closeness remained unassociated with sexual initiation; mother's report of negative reactions to sex remained significantly associated with sexual initiation, though the association weakened (OR: 0.91, 95% CI: 0.83-0.99). Adjusting for confounders, the only association that remained significant was between adolescents' expectations of negative maternal reactions to sex and sexual initiation (adjusted odds ratio (AOR): 0.85, 95% CI: 0.74-0.98) (Table 3, Model 4).

Sociodemographic variables. Among all adolescents, being female, Black, aged 16 or 17, and demonstrating delinquent behaviors were associated with an increased risk of initiating sex by Wave II (Table 3, Model 4). Being Hispanic, having good grades, having a mother with more than a high school education, being religious, and living with both a mother and a father

were associated with a decreased risk.

Multivariate Associations: Sexual Initiation, by Gender

Boys. In unadjusted analyses examining both adolescent's and mother's reports, boys with greater expectations of negative maternal reactions to sex were less likely to initiate sex (OR: 0.74, 95% CI: 0.63-0.88) (Table 4, column 1). There were no significant associations between boys' reports of mother-child closeness or mothers' reports of mother-child closeness or negative reactions to sex and sexual initiation. Controlling for confounders, no mother-child relationship characteristics were associated with risk of sexual initiation (Table 4, column 2).

Sociodemographic variables. Among boys, being Black, being age 16 or 17, and having a high number of delinquent behaviors were associated with an increased likelihood of sexual initiation (Table 4, column 2). Having a mother with more than a high school education, being religious, and living with both a mother and father were associated with a decreased likelihood.

(Table 4 about here)

Girls. Unadjusted analyses among girls indicated that those who reported greater mother-child closeness (OR: 0.81, 95% CI: 0.68-0.97) and who reported greater expectations of negative maternal reactions to sex (OR: 0.69, 95% CI: 0.61-0.79) were less likely to initiate sex (Table 4, column 3). Additionally, adolescents whose mothers reported greater disapproval of sex were less likely to initiate sex (OR: 0.89, 95% CI: 0.78-1.00); however, there was no significant association between mothers' reports of mother-child closeness and sexual initiation. In adjusted analyses, the only association that remained significant was between adolescents' expectations of negative maternal reactions to sex and sexual initiation (AOR: 0.82, 95% CI: 0.69-0.96) (Table 4, column 4).

Sociodemographic variables. Among girls, being aged 16 or 17 and engaging in

delinquent activities were associated with an increased risk of sexual initiation. In contrast, being Hispanic, having good grades, being very religious, and living with both a mother and a father were associated with decreased risk (Table 4, column 4).

Multivariate Associations: Sexual Initiation, by Race/Ethnicity and Gender

White boys. Among White boys, unadjusted analyses revealed that boys who reported greater expectations of negative maternal reactions to sex were less likely to initiate sex by Wave II (OR: 0.74, 95% CI: 0.60-0.90) (Table 5, column 1). There were no significant associations between boys' reports of mother-child closeness or mothers' reports of mother-child closeness or negative maternal reactions to sex and sexual initiation. In adjusted analyses, the association between adolescents' expectations of negative maternal reactions to sex and sexual initiation weakened and was no longer significant. There remained no significant associations between boys' reports of mother-child closeness or mothers' reports of mother-child closeness or negative maternal reactions to sex and sexual initiation (Table 5, column 2). However, though not significant, it appeared that boys whose mothers who reported higher levels of mother-child closeness were more likely to initiate sex (AOR: 1.25, 95% CI: 0.90-1.74).

(Table 5 about here)

Sociodemographic variables. Among White boys, being aged 16 or 17 and engaging in very delinquent behavior were associated with an increased risk of sexual initiation. In contrast, having a mother with more than a high school education, being religious, and living with both a mother and father were associated with a decreased risk (Table 5, column 2).

Black boys. In unadjusted analyses among Black boys, it appeared that boys who reported greater expectations of negative maternal reactions to sex were much less likely to initiate sex (OR: 0.63, 95% CI: 0.46-0.86) (Table 5, column 3). There were no significant

associations between boys' reports of mother-child closeness or mothers' reports of mother-child closeness or negative maternal reactions to sex and sexual initiation. In adjusted analyses, the association between adolescents' expectations of negative maternal reactions to sex and sexual initiation weakened and was no longer significant, and there remained no significant associations between boys' reports of mother-child closeness or mothers' reports of mother-child closeness or negative maternal reactions to sex and sexual initiation (Table 5, column 4). However, though not significant, it appeared that boys whose mothers reported higher levels of mother-child closeness were more likely to initiate sex (AOR: 1.40, 95% CI: 0.67-2.94).

Sociodemographic variables. Among black boys, being delinquent was associated with a much greater likelihood of sexual initiation (Table 5, column 4). Being aged 17, having a mother with at least a high school education, and living in a household with low functional income were associated with a decreased likelihood of sexual initiation.

Hispanic boys. In both adjusted and unadjusted analyses among Hispanic boys, there were no significant associations between boys' or mothers' reports of mother-child closeness or negative maternal reactions to sex and sexual initiation (Table 5, column 5). However, adjusted analyses indicated that Hispanic boys with greater expectations of negative maternal reactions to sex were more likely to have sex, though this association was not significant (AOR: 1.34, 95% CI: 0.82-2.20) (Table 5, column 6).

Sociodemographic variables. Among Hispanic boys, having a mother with only a high school education and being highly delinquent were associated with an increased risk of sexual initiation (Table 5, column 6).

White girls. Among White girls, unadjusted analyses revealed that girls who reported higher levels of mother-child closeness (OR: 0.78, 95% CI: 0.64-0.97) or who reported greater

expectations of negative maternal reactions to sex (OR: 0.67, 0.56-0.79) were less likely to initiate sex (Table 6, column 1). Additionally, girls whose mothers reported greater negative reactions to sex were marginally less likely to have initiated sex (OR: 0.84, 95% CI: 0.69-1.01). Adjusting for confounders, the only association that remained significant was between adolescents' expectations of negative maternal reactions to sex and sexual initiation (AOR: 0.77, 95% CI: 0.63-0.97) (Table 6, column 2).

(Table 6 about here)

Sociodemographic variables. Among White girls, being aged 16 or 17 and engaging in delinquent activities were associated with an increased risk of sexual initiation, whereas having good grades and being religious were associated with a decreased risk (Table 6, column 2).

Black girls. In unadjusted analyses among Black girls, there were no significant associations between girls' or mothers' reports of mother-child closeness or negative maternal reactions to sex and sexual initiation (Table 6, column 3). Adjusted analyses revealed that Black girls who thought their mothers would be very upset if they had sex were marginally more likely to initiate sex (AOR: 1.41, 95% CI: 0.97-2.04) (Table 6, column 4). Additionally, though not significant, Black girls whose mothers reported higher levels of mother-child closeness also were more likely to initiate sex (AOR: 1.30, 95% CI: 0.93-1.81).

Sociodemographic variables. Among Black girls, being moderately delinquent was associated with an increased likelihood of sexual initiation. In contrast, having a mother with a high school education or greater, living in a household with low functional income, and living with both a mother and a father were associated with a decreased likelihood (Table 6, column 4).

Hispanic girls. In both unadjusted analyses among Hispanic girls, girls who reported greater expectations of negative maternal reactions to sex were much less likely to initiate sex

(OR: 0.62, 95% CI: 0.45-0.83; AOR: 0.61, 95% CI: 0.44-0.84) (Table 6, column 5 and 6). There were no significant associations between girls' reports of mother-child closeness or mothers' reports of mother-child closeness or negative reactions to sex and sexual initiation.

Sociodemographic variables. Among Hispanic girls, no sociodemographic characteristic was associated with risk of sexual initiation (Table 6, column 6).

DISCUSSION

The findings of this study support previous findings and validate the key hypothesis of this study that higher levels of mother-child closeness and maternal disapproval of sex significantly delay sexual initiation in adolescence (Ream & Savin-Williams, 2005; Sieving, McNeely, & Blum, 2000). Controlling for confounding variables, the most important component of maternal influence seems to be adolescents' expectations that mothers would be upset if they had sex, again validating the second hypothesis that adolescents' expectations of the sanction of upsetting their mothers would represent a cost salient enough to cause them to delay sex. This finding indicates that the rational choice model is appropriate for understanding why adolescents engage in sexual activity: upsetting one's mother clearly represents a salient-enough cost to influence an adolescent to delay sex. However, this study found that, among all adolescents, adolescents' expectations of these characteristics seem to have greater influence on delaying sexual initiation than mothers' reports, and adolescents expected less disapproval than their mothers themselves expressed. This suggests that maternal influence is likely to decline as adolescent group norms become more accepting of sexual activity.

The third hypothesis of differential associations across subgroups was supported and, as expected, the significant associations were found among girls, not boys. The hypothesis that Black girls would react most strongly to potential disapproval by mothers by delaying sexual

activity was not supported. An interesting and unexpected finding was that among Black girls, mothers' perceptions of mother-child closeness and adolescents' expectations of negative maternal reactions to sex were associated with an increased likelihood of sex. Although it was hypothesized that there would be differential sizes and significances of associations between mother-child relationship characteristics and sexual initiation, it was not hypothesized that the directions of these associations would differ across subgroups.

It is possible that, in Black families, adolescents who were aware of their mother's disapproval of sex chose to engage in sexual behavior as a form of rebellion. It is, perhaps, more possible that the mothers in these relationships became aware of their children's impending initiation of sexual activity and increased their expression of disapproval of sex in order to delay their children's behavior, thus explaining why higher perceptions of disapproval are linked with subsequent sexual initiation. Perhaps most importantly, it is possible that the association between mother-child closeness and sexual initiation is representative of the impact of overly close, "peerified" relationships (Burton, 2007) between mothers and children. Especially in households comprising a single mother and daughter, the mother may act more like a friend than a parent, and the mother might be more accepting of the child's sexual behavior, thus putting the child at a greater risk of sexual initiation. Along the same lines, it is possible that when mothers become aware of the child's imminent sexual activity, they feel closer to their child; in this case, closeness, in a way, can be conceptualized as an outcome of adolescent sexual activity.

Conclusions and Implications

These findings have the potential to inform more effective, population-specific sexual risk prevention programs that may reduce disparate rates of sexual initiation between and across groups. Although both boys and girls, as a whole, seem to be less likely to initiate sexual

activity if they think that sex would upset their mothers, once confounding variables are controlled this association is only significant for girls. Successful gender-specific programs might include mothers and relationship factors in the programs for girls, but focus on other indicators of risk, such as delinquency, for boys. In fact, providing non-group-specific programs has the potentially deleterious effect of increasing the likelihood of initiating sex for some. For example, there is evidence that negative maternal reactions to sex are associated with greater sexual initiation risk among Black girls. The message, then, is that even though it seems that mother-child relationship characteristics might delay sex for adolescents, programs that work with certain racial, ethnic, and gender groups should use caution in implementing programs that impact these or other mother-child relationship qualities.

Although this study fills a critical research gap in examining population-specific, longitudinal, adjusted associations between mother-child relationship characteristics and adolescent sexual initiation, several limitations must be noted. First, the data are limited by self-report. It is possible that adolescents were dishonest about whether or not they had initiated sexual activity in order to provide more desirable responses. Second, this study is limited in its measures of mother-child characteristics. It is possible that other mother-child relationship characteristics, such as monitoring or communication, are more important in predicting sexual initiation, and future studies should assess these variables. Third, this study is limited in its examination of only mother-child dyads. It is possible that father-child influences have disparate effects on sexual activity, especially among boys, since father-son relationships and communication about sex may implicitly or explicitly condone or encourage sex (Hampton, Jeffery, McWatters, & Smith, 2005; Wight, Williamson, & Henderson, 2006), thereby leading to increased and earlier sexual activity among boys. Fourth, by using only older adolescents, the

findings of this study may be limited in their generalizability. That is to say, groups that are more likely to initiate sex at very young ages (younger than 15) – such as boys, Blacks, and Hispanics – may have been under-represented in this sample on the basis of their initiation of sexual initiation prior to Wave I; these individuals may be differentially affected by mother-child relationships. Finally, this study is limited by using only two time points in adolescence. By using measures that are close in time (approximately one year apart), it is possible that these findings underestimate the transactional nature of these associations. That is, it is possible that many of these adolescents are on the cusp of sexual initiation at Wave I, which might affect how they perceive their mother's reactions towards sex. Likewise, it is possible that mothers are aware of their child's impending sexual initiation and may take steps to foster a closer relationship with their child or may make a greater effort to reinforce their disapproval of sex.

Overall, by providing further support that maternal influence is not only associated with sexual initiation but, in fact, may be predictive of sexual initiation, this study points to the potential success of teen sexual health programs that encourage mothers to make sure their children know (or think) that they disapprove of them having sex – even if this is not necessarily the case. Additionally, these findings have important parent education implications, as parents of adolescents often underestimate the degree to which they influence their children's sexual behaviors (Albert, 2007).

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Table 1. Sample Characteristics of 3,130 U.S. White, Black, and Hispanic U.S. Adolescent Virgins at Wave I (aged 15-17 at Wave I) §

	Total Sample Weighted % (N=3,130)	White (Referent) Weighted % (n=2,039)	Black Weighted % (n=454)	Hispanic Weighted % (n=637)		
Sexual Activity (by Wave II)						
Sexual Initiation	23.4	22.6	33.0	*	21.1	
Sociodemographics (Wave I)						
<i>Gender</i>						
Male	47.5	49.8	35.2	*	42.5	*
Female	52.5	50.2	64.8	*	57.5	*
<i>Age</i>						
15	46.1	45.8	46.2		47.4	
16	34.5	34.5	34.4		34.7	
17	19.4	19.7	19.4		17.9	
<i>Grades</i>						
Good Grades (A's and B's)	53.8	57.8	38.0	*	40.4	*
Good Grades (C's, D's, and F's)	46.2	42.2	62.0	*	59.6	*
<i>Mother's Education</i>						
Less than High School	14.9	8.9	18.2	*	49.2	*
High School	31.2	32.8	33.5		19.7	*
More than High School	53.9	58.3	48.3	*	31.2	*
<i>Household Poverty</i>						
No Low Functional Income	89.5	93.0	71.4	*	81.2	*
Low Functional Income	10.5	7.0	28.6	*	18.8	*
<i>Religiosity</i>						
Not at All Religious	10.2	11.0	10.6		4.8	*
Somewhat Religious	50.4	52.4	31.5	*	52.4	
Very Much Religious	39.4	36.7	57.9	*	42.8	
<i>Delinquency(past year)</i>						
Not Delinquent (0 acts)	23.1	22.7	24.9		24.0	
Moderately Delinquent (1-3 acts)	52.2	53.3	53.1		44.8	*
Very Delinquent (>3 acts)	24.8	24.0	22.1		31.3	*
<i>Household Structure</i>						
Mother and Father Household	77.3	81.2	49.4	*	73.9	*
Not Mother and Father Household	22.7	18.9	50.6	*	26.1	*

§ Percentages may not add to 100 because of rounding error

* Significantly different from White adolescents (the referent) at the $p < 0.5$ level

Table 2. Weighted Means and Standard Deviations of Mother-Child Characteristics of 3,130 U.S. White, Black, and Hispanic U.S. Adolescent Virgins at Wave I (aged 15-17 at Wave I)

	Total Sample (N=3,130)		White (Referent) (n=2,039)		Black (n=454)		Hispanic (n=637)	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Mother-Child Characteristics (Wave I)								
<i>Adolescent's Reports</i>								
Mother-Child Closeness	4.56	0.02	4.54	0.03	4.62	* 0.05	4.63	* 0.04
Maternal Disapproval of Sex	4.32	0.02	4.35	0.03	4.24	0.09	4.18	* 0.05
<i>Mother's Reports</i>								
Mother-Child Closeness	4.30	0.02	4.25	0.02	4.38	* 0.05	4.54	* 0.05
Maternal Disapproval of Sex	4.51	0.03	4.59	0.02	4.33	* 0.06	4.18	* 0.14

§ Scale from 1-5, with 1=Not at All and 5=Very Much

* Significantly different from white adolescents (the referent) at the $p < 0.5$ level

Table 3. Odds Ratios (ORs) and 95% Confidence Intervals (CIs) of Associations between Mother-Child Relationship Characteristics and Sexual Initiation between Waves I and II, among 3,130 White, Black and Hispanic Adolescents Aged 15-17 at Wave I in the United States

	Model 1	Model 2	Model 3	Model 4
	Adolescent OR (95% CI)	Mother OR (95% CI)	Mother & Adolescent OR (95% CI)	Full Model OR (95% CI)
Mother-Child Characteristics				
<i>Adolescent Report</i>				
Closeness	0.84 (0.73-0.96) *		0.84 (0.73-0.97) *	0.91 (0.79-1.05)
Sex Would Upset Mother	0.72 (0.64-0.80) **		0.73 (0.65-0.82) **	0.85 (0.74-0.98) *
<i>Mother Report</i>				
Closeness		0.96 (0.78-1.17)	0.99 (0.81-1.21)	1.08 (0.87-1.35)
Sex Would Upset Mother		0.87 (0.80-0.94) **	0.91 (0.83-0.99) *	0.97 (0.86-1.09)
Sociodemographics				
<i>Gender</i>				
Female				1.29 (1.04-1.59) *
<i>Race/Ethnicity</i>				
Black				1.51 (1.00-2.27) †
Hispanic				0.71 (0.47-1.06) †
<i>Age</i>				
Age 16				1.55 (1.19-2.01) **
Age 17				1.67 (1.20-2.33) **
<i>Grades</i>				
Good Grades (A's and B's)				0.76 (0.59-0.97) *
<i>Maternal Education</i>				
High School				0.92 (0.63-1.33)
More than High School				0.65 (0.44-0.95) *
<i>Household Poverty</i>				
Low Functional Income				1.01 (0.68-1.51)
<i>Religiosity</i>				
Somewhat Religious				0.65 (0.46-0.92) *
Very Much Religious				0.39 (0.25-0.62) **
<i>Delinquency</i>				
Moderately Delinquent (1-3 acts)				1.71 (1.17-2.51) **
Very Delinquent (>3 acts)				3.39 (2.18-5.28) **
<i>Household Structure</i>				
Mother and Father Household				0.63 (0.47-0.84) **

** significant at $p < 0.01$, * significant at $p < 0.05$, † significant at $p < 0.10$

Table 4. Odds Ratios (ORs) and 95% Confidence Intervals (CIs) of Associations between Mother-Child Relationship Characteristics and Sexual Initiation between Waves I and II, among 3,130 White, Black and Hispanic Adolescents Aged 15-17 at Wave I in the United States, By Sex

	Males (n=1,462) OR (95% CI)		Females (n=1,668) OR (95% CI)	
Mother-Child Characteristics				
<i>Adolescent Report</i>				
Closeness	0.91 (0.73-1.13)	0.95 (0.75-1.21)	0.81 (0.68-0.97)	* 0.87 (0.72-1.06)
Sex Would Upset Mother	0.74 (0.63-0.88)	** 0.88 (0.72-1.07)	0.69 (0.61-0.79)	** 0.82 (0.69-0.96) *
<i>Mother Report</i>				
Closeness	1.08 (0.83-1.41)	1.19 (0.89-1.58)	0.92 (0.72-1.18)	0.98 (0.74-1.28)
Sex Would Upset Mother	0.92 (0.79-1.08)	1.05 (0.87-1.25)	0.89 (0.78-1.00)	* 0.91 (0.79-1.04)
Sociodemographics				
<i>Race/Ethnicity</i>				
Black		1.80 (1.12-2.88)	*	1.40 (0.80-2.46)
Hispanic		0.88 (0.50-1.56)		0.58 (0.36-0.95) *
<i>Age</i>				
Age 16		1.52 (1.00-2.29)	*	1.55 (1.14-2.11) **
Age 17		1.89 (1.03-3.47)	*	1.54 (1.04-2.27) *
<i>Grades</i>				
Good Grades (A's and B's)		0.82 (0.57-1.19)		0.70 (0.50-0.99) *
<i>Maternal Education</i>				
High School		0.75 (0.40-1.40)		1.12 (0.68-1.86)
More than High School		0.58 (0.31-1.08)	†	0.69 (0.44-1.10)
<i>Household Poverty</i>				
Low Functional Income		1.08 (0.57-2.06)		0.99 (0.57-1.70)
<i>Religiosity</i>				
Somewhat Religious		0.57 (0.33-0.97)	*	0.74 (0.45-1.22)
Very Much Religious		0.40 (0.21-0.79)	**	0.39 (0.22-0.70) **
<i>Delinquency</i>				
Moderately Delinquent (1-3 acts)		1.62 (0.82-3.23)		1.75 (1.17-2.61) **
Very Delinquent (>3 acts)		4.55 (2.36-8.74)	**	2.35 (1.42-3.89) **
<i>Household Structure</i>				
Mother and Father Household		0.57 (0.38-0.85)	**	0.67 (0.44-1.03) †

** significant at $p < 0.01$, * significant at $p < 0.05$, † significant at $p < 0.10$

Table 5. Odds Ratios (ORs) and 95% Confidence Intervals (CIs) of Associations between Mother-Child Relationship Characteristics and Sexual Initiation between Waves I and II, among 3,130 White, Black and Hispanic Adolescents Males Aged 15-17 at Wave I in the United States, by Race/Ethnicity

	White Males (n= 1,020) ORs (95% CIs)		Black Males (n= 166) ORs (95% CIs)		Hispanic Males (n=276) ORs (95% CIs)	
Mother-Child Characteristics						
<i>Adolescent Report</i>						
Closeness	0.89 (0.69-1.14)	0.93 (0.71-1.21)	0.90 (0.48-1.69)	0.79 (0.43-1.47)	0.93 (0.50-1.74)	0.98 (0.43-2.25)
Sex Would Upset Mother	0.74 (0.60-0.90) **	0.86 (0.68-1.08)	0.63 (0.46-0.86) **	0.75 (0.50-1.14)	1.01 (0.66-1.56)	1.34 (0.82-2.20)
<i>Mother Report</i>						
Closeness	1.14 (0.83-1.58)	1.25 (0.90-1.74)	1.02 (0.50-2.06)	1.40 (0.67-2.94)	0.70 (0.39-1.23)	0.88 (0.43-1.77)
Sex Would Upset Mother	0.93 (0.77-1.13)	1.09 (0.85-1.40)	0.96 (0.70-1.33)	0.77 (0.52-1.15)	0.97 (0.57-1.65)	1.05 (0.63-1.75)
Sociodemographics						
<i>Age</i>						
Age 16		1.51 (0.95-2.41) †		1.20 (0.45-3.23)		2.29 (0.77-6.76)
Age 17		2.20 (1.11-4.35) *		0.31 (0.09-1.13) †		3.08 (0.62-15.40)
<i>Grades</i>						
Good Grades (A's and B's)		0.77 (0.48-1.24)		1.88 (0.63-5.61)		0.75 (0.26-2.16)
<i>Maternal Education</i>						
High School		0.61 (0.27-1.39)		0.09 (0.01-0.58) *		3.65 (1.32-10.06) *
More than High School		0.49 (0.22-1.07) †		0.12 (0.02-0.64) *		0.90 (0.32-2.56)
<i>Household Poverty</i>						
Low Functional Income		1.35 (0.63-2.86)		0.20 (0.03-1.15) †		1.15 (0.22-5.99)
<i>Religiosity</i>						
Somewhat Religious		0.57 (0.32-1.04) †		0.55 (0.07-4.37)		0.63 (0.09-4.55)
Very Much Religious		0.38 (0.18-0.82) *		0.67 (0.08-5.77)		0.39 (0.05-3.09)
<i>Delinquency</i>						
Moderately Delinquent (1-3 acts)		1.40 (0.63-3.12)		3.24 (0.85-12.38) †		2.01 (0.38-10.59)
Very Delinquent (>3 acts)		4.41 (2.05-9.47) **		7.11 (1.72-29.43) **		5.30 (1.57-17.94) **
<i>Household Structure</i>						
Mother and Father Household		0.63 (0.38-1.03) †		0.52 (0.20-1.39)		0.41 (0.10-1.70)

** significant at $p < 0.01$, * significant at $p < 0.05$, † significant at $p < 0.10$

Table 6. Odds Ratios (ORs) and 95% Confidence Intervals (CIs) of Associations between Mother-Child Relationship Characteristics and Sexual Initiation between Waves I and II, among 3,130 White, Black and Hispanic Adolescents Females Aged 15-17 at Wave I in the United States, by Race/Ethnicity

	White Females (n=1,019) ORs (95% CIs)	Black Females (n=288) ORs (95% CIs)	Hispanic Females (n=361) ORs (95% CIs)
Mother-Child Characteristics			
<i>Adolescent Report</i>			
Closeness	0.78 (0.64-0.97) *	0.99 (0.61-1.59)	0.73 (0.44-1.19)
Sex Would Upset Mother	0.67 (0.56-0.79) **	0.98 (0.73-1.31)	0.62 (0.45-0.83) **
<i>Mother Report</i>			
Closeness	0.90 (0.62-1.30)	1.26 (0.91-1.75)	0.77 (0.50-1.17)
Sex Would Upset Mother	0.84 (0.69-1.01) †	0.85 (0.66-1.09)	0.94 (0.76-1.16)
Sociodemographics			
<i>Age</i>			
Age 16	1.76 (1.18-2.63) **	1.13 (0.49-2.59)	0.93 (0.32-2.73)
Age 17	1.61 (0.94-2.74) †	1.62 (0.63-4.15)	1.25 (0.51-3.06)
<i>Grades</i>			
Good Grades (A's and B's)	0.69 (0.46-1.03) †	0.81 (0.40-1.63)	0.61 (0.23-1.64)
<i>Maternal Education</i>			
High School	1.33 (0.65-2.70)	0.45 (0.20-1.03) †	1.34 (0.37-4.80)
More than High School	0.81 (0.42-1.58)	0.35 (0.17-0.75) **	0.54 (0.17-1.74)
<i>Household Poverty</i>			
Low Functional Income	1.61 (0.77-3.35)	0.46 (0.19-1.10) †	0.80 (0.27-2.33)
<i>Religiosity</i>			
Somewhat Religious	0.58 (0.35-0.99) *	2.42 (0.64-9.13)	1.86 (0.33-10.46)
Very Much Religious	0.34 (0.18-0.65) **	0.56 (0.16-1.94)	1.44 (0.22-9.41)
<i>Delinquency</i>			
Moderately Delinquent (1-3 acts)	1.78 (1.10-2.88) *	1.98 (0.83-4.72) †	1.71 (0.36-8.22)
Very Delinquent (>3 acts)	2.17 (1.17-4.05) *	2.17 (0.62-7.59)	3.17 (0.74-13.55)
<i>Household Structure</i>			
Mother and Father Household	0.73 (0.41-1.31)	0.50 (0.25-0.98) *	0.83 (0.29-2.41)

** significant at $p < 0.01$, * significant at $p < 0.05$, † significant at $p < 0.10$