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Is it Necessary to Walk the Talk? The Effects of Maternal Experiences and Communication on the Sexual Behavior of Female Adolescents

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ABSTRACT

Is it Necessary to Walk the Talk? The Effects of Maternal Experiences and Communication on the Sexual Behavior of Female Adolescents[*]

Numerous social marketing campaigns exhort parents to talk to their children about sexual abstinence and pregnancy/STD prevention while child-development experts advise parents to initiate discussions about reproductive health and related values at an early age. The efficacy of these marketing campaigns and the precise impact of ongoing dialogue between parents and children are difficult to ascertain, however, if parents are more likely to broach related topics with adolescents with otherwise greater propensities for risky behavior. While extant research recognizes the importance of family environment and parenting activities, little has been done to separately control for the various aspects of parenting that might confound the influence of the marketing campaigns. We separately identify the effects of parenting style, a parent's own risky behavior, and the parent's communication about sex on her adolescent's sexual behavior. OLS models indicate that female adolescents with less strict parents, whose mothers gave birth as teenagers, or whose mothers communicate more about sex are more likely to have sexual intercourse, practice unsafe sex, and engage in casual sex. After controlling for the endogeneity of parental talk, though, we find that an increase in parental talk neither increases nor decreases the probability an adolescent has had sex, unsafe sex, or casual sex. The only exception is a strongly significant result that more communication about sex from mothers who were themselves teen mothers actually *increases* the probability a daughter has had sex.

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Although teen pregnancy rates in the U.S. are at an all time low (Hamilton and Ventura, 2012), the U.S. still has the highest teen pregnancy rate among developed countries (Centers for Disease Control, 2011). Currently about one-third of girls will give birth before age 20 (National Campaign to Prevent Teen Pregnancy, 2011). Furthermore, recent estimates indicate that rates of unintended pregnancy are highest amongst those aged 15 to 19 years old (Finer, 2010). In 2008, births to teen mothers cost taxpayers (federal, state and local) approximately $11 billion (National Campaign to Prevent Teen Pregnancy, 2011).

But a much wider range of concerns regarding adolescent sexual activity - including health, social, economic and even moral ramifications – continue to motivate involvement by parents, professionals, and policy makers. A variety of programs are in place to attempt to delay the sexual debut of adolescent women and/or teach them about contraceptive use (Lindberg et al., 2006). Among these interventions are informational campaigns targeting parents and encouraging them to speak to their children about sex.[1] The Department of Health and Human Services' "Parents Speak Up" emphasizes an abstinence-first message, for example. The National Campaign to Prevent Teen Pregnancy, on the other hand, supports parents in providing more "comprehensive" information and even provides discussion guides for use with MTV's popular television show *16 and Pregnant*. On top of big budget campaigns like these, child-development experts advise age-appropriate and continuing dialogue between parents and children regarding sex (Bernstein, 2011). Despite the widespread support for parent-child communication about sex, the effect of these conversations, and thus the efficacy of the social marketing campaigns, is unknown. The effect is also difficult to ascertain because those parents who are most likely to talk to their adolescents about these issues may also be those who have

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[1] These campaigns are not dissimilar from long-standing social marketing campaigns like The Partnership for a Drug Free America's *TimeToTalk* initiative aimed at adolescent substance use or a newer campaign by Children Now which encourages parents to address a range of topics from terrorism to HIV and to "talk to your kids before everyone else does."

the most reason to be concerned about their child's behavior. Therefore, in this research we carefully address the endogeneity of parent-child communication while also accounting for other aspects of parenting in order to identify the causal influence of parental communication on adolescent sexual activity.

Specifically, we use data from the National Longitudinal Study of Adolescent Health (AddHealth) to examine the influence that mother-daughter discussions (hereafter, parental "talk"), parenting style, and parent risky behaviors (parental "walk") have on a female adolescent's decision to engage in sexual intercourse or safe sex practices (e.g., condom use). Utilizing an instrumental variables approach, we measure the effect of "talk" on the teen's propensity to engage in sexual intercourse while holding constant parenting style, school influences, and the parent's own behavior. Ours is the first research to isolate the effect of parental talk from other aspects of parenting.

Our concept of parental talk is novel in the economics literature, although numerous social scientist have explored related issues.[2] Theoretical models in the sociological and developmental psychology literature have linked high levels of parental supervision and discipline with positive outcomes and a reduced propensity of adolescents to engage in risky behavior (Fletcher et al. 1995; Amato and Rivera 1999; Amato and Fowler 2002; Browning et al. 2005). Increased supervision and monitoring are hypothesized to limit the opportunities and incentives for engaging in risky behavior. Others have found empirical correlations that they interpret as support for these hypotheses (for example, Richardson et al. 1993; Vandell and Ramanan 1991). Expressing concern that the findings described above might be endogenous if levels of supervision are driven by unobservable parent characteristics, Aizer (2004) found that

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[2] Some other social scientists have explored parent-child communication. See, as examples, Swain et al. (2006), a discussion of the predictors of the extent and content of parent communication, and Blake et al. (2001), a small scale experimental study of parent involvement with school-based sex education curriculum.

an increase in adult supervision reduced truancy, alcohol and marijuana use, theft, and fighting among school-age children.

There is little empirical research in adolescent risky behavior on parental inputs other than basic parent characteristics and supervision and even less that attempts to uncover the causal relationship between parenting activities and adolescent outcomes. If a parent expects risky behavior from her child or foresees negative influences from her adolescent's peer group, she may find more incentive to talk to her child. If a parent is aware of school curricula that effectively discourage risky behaviors, she may choose to talk to her child about similar things less frequently or less forcefully. If any of these potential scenarios is true, estimation of a simple production function of adolescent risky behavior will return biased estimates of the true effect of parental talk.

Our findings demonstrate that parental talk is endogenous. In OLS regressions we find that parental talk is associated with a higher probability of having sex, having unsafe sex, and engaging in sexual activities outside of a romantic relationship (hereafter, "casual sex"). However, when using instrumental variables to effectively control for endogeneity, we find that parental talk does not increase the likelihood of adolescent sexual risky behavior at least among female adolescents whose mothers were not teenage mothers. The only exception is found among daughters of teenage mothers, where more talk from (previously) teenage mothers significantly increases the likelihood the adolescent has had sex. To summarize, talk is not an important predictor of adolescent risky sexual behavior in most cases, but it does seem to be important that mothers have "walked the talk" to avoid the presumably unintended consequence of increased probability of adolescent sex.

The Costs and Consequences of Various Sexual Activity

We explore a variety of sexual behaviors in adolescents. Before discussing our model and data, we provide a brief overview of some of the consequences of adolescent sex as well as evidence that the sexual behaviors we examine are particularly salient for adolescent girls.

The consequences and costs of adolescent sex are well documented, particularly in the case of unprotected sex and multiple sexual partners – behaviors that are often termed "risky." Pregnancy, sexually transmitted diseases (STDs), and even depression are potential costs associated with risky sexual activity. Sabia and Rees (2008) use an IV approach to find that sexually active females, especially those not utilizing contraceptives, exhibit more symptoms of depression. STDs are also of considerable concern for women. The Centers for Disease Control reports that 1 in 4 young women between the ages of 14 and 19 in the U.S. is infected with at least one of the most common STDs (human papillomavirus (HPV), Chlamydia, herpes simplex virus, and trichomoniasis) (CDC, 2010). Women are more likely to contract an STD than men when they have sex with an infected partner and do not use a condom, and women who are infected are more likely than infected men to be asymptomatic, which can lead to serious health complications. Furthermore, STDs may have more serious consequences for women including Pelvic Inflammatory Disease, ectopic pregnancy, and cervical cancer than for men (Landry and Turnbull, 1997).

Sexual intercourse with condoms (sometimes referred to as "safer sex") may have negative consequences as well. First, many teenagers do not use condoms correctly and consistently (Santelli et al., 1998).Within our sample from the AddHealth, fewer than 1 percent of sexually active adolescents report using condoms at every sexual encounter. If condoms are not used at all times correctly, intercourse is not without the above-stated physical risks.

A large interdisciplinary literature suggests that adolescent sex, even when condoms are used, can lead to adverse consequences. Among the small number of causal analyses in this area, Sabia and Rees (2011) find that females have a higher probability of high school graduation if they abstain from sex. Additionally, it is clear from the AddHealth that mothers at least perceive moral ramifications as well as consequences among their child's peer group of their daughters' sexual activity, since they report discussing these concerns with their adolescents. While sexual intercourse might increase self-esteem among males, non-virgin females are at increased risk for poor self-esteem (Sabia and Rees 2008).

We take advantage of the richness of the AddHealth data, described in more detail below, by using three measures of adolescent sexual activity each of which speaks to distinct research questions and policy debates. First, we consider whether the adolescent has ever engaged in sexual intercourse, or "has had sex." This is our broadest measure and is directly relevant to the debate regarding "abstinence only" education and the relevance of abstinence as an alternative choice. In some cases though, parents and/or policy makers may be more concerned about "risky sex" which we characterize in two ways: the proportion of times the adolescent has engaged in intercourse without using a condom and participation in sexual activity outside of a romantic relationship. We define "unsafe sex" as using condoms less than "most of the time" when engaging in vaginal intercourse. AddHealth respondents also report whether or not they have engaged in a sexual activity outside of a romantic relationship, what we call "casual sex."[3]

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[3] Unfortunately, although we would have liked to include data on other types of sexual activity including anal and oral sex, the AddHealth did not collect data on anal sex until wave 2 (and then only for girls who are in a relationship) and did not collect data on oral sex until wave 3 (at which time the respondents are young adults). Given that our primary variable of interest is mother's talk about sex, which is only measured at wave 1, we must limit our analyses to vaginal sexual intercourse except in the case of casual sex where the survey question does not distinguish between sexual activity generally and intercourse specifically.

I. The Model

In the production process of adolescent behavior, both parents and adolescents are decision-makers. A parent makes a set of choices in order to maximize her utility which may include investments in children, labor market participation, schooling, marriage, and leisure. Her parental investments (including talk, walk, and parenting style) may influence her child in two distinct ways. She may influence the resource constraint that the adolescent faces, commonly thought of as punishment. She may also influence her child's values; i.e., alter the fundamentals of the adolescent's utility function. Possessing a utility function that is, in part, shaped by parental values and a resource constraint that is largely determined by an endowment from her parent, an adolescent maximizes his utility over choices of risky behaviors. In this research we estimate reduced form production function models of adolescent risky-behaviors with a special focus on observed parental inputs while recognizing that the choice of a parent's inputs is very likely correlated with her expectations of her child's behavior.[4]

In our empirical work, we are interested in estimating the effects of parental inputs on child outcomes related to sexual behavior. Our empirical model can be stated as follows:

(1) $R_i = \alpha PT_i + \delta PB_i + \Theta PS_i + \gamma' F_i + \beta' X_i + \varepsilon_i,$

where PT_i represents the amount of communication the adolescent's parent reports having with her child about sex, PB_i is a dichotomous variable equal to 1 if the adolescent has a parent who was a teenage mother, PS_i is our index of parenting style, which ranges from permissive to strict. F_i is a vector of family size and birth order dummy variables;[5] and the vector X_i contains a variety of other controls including information on the mother, the family's socioeconomic status,

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[4] While we find much evidence that parenting inputs of many types influence adolescent outcomes, in our data the parenting inputs themselves are not highly correlated. (The greatest pair-wise correlation among talk, walk, and parenting style is about .15 between talk and teenaged mother.) Furthermore, following empirical tests of endogeneity of walk and parenting style we cannot reject that these variables are exogenous to adolescent sexual behavior.

[5] Existing research has documented the role of family size and birth order in the production of risky adolescent behavior. See for example, Rodgers et al. 1992, Argys et al. 2006, and Averett et al. 2011.

and child demographics including age, race, and religion. R_i is one of our three dichotomous measures of adolescent sexual activity.

The AddHealth's school-based sampling design allows us to identify multiple adolescents across many schools. Previous research has identified individual-invariant school effects that include student peer group (Gaviria and Raphael 2001) and school curriculum and policies, including sex education (Oettinger 1999). Thus, we further refine our model to portion out the variation in adolescent behavior due to unobserved factors of the adolescent's school by adding school fixed effects, denoted s_j below (where j indexes schools). This is particularly important in the context of our research question because it eliminates a potential source of endogeneity of parental talk. One might expect that the talk behavior of a parent is affected by her expectations of what the child is hearing at school about risky behaviors through both informal and formal channels. Controlling for school fixed effects has the added bonus of eliminating the need to identify which school policies are, in fact, effective in reducing adolescent risky behavior while allowing that such factors still may have significant influence on the adolescent's outcomes.[6] School fixed effects may also capture some of the influence of an adolescent's peer group. These groups and the social interactions they facilitate can have significant effects on risky behavior (Ali and Dwyer 2011, Fletcher 2009, Kawaguchi 2004).

Yet school fixed effects cannot eliminate any family-specific or child-specific unobserved heterogeneity that may continue to confound the estimated effect of parental talk. Therefore, we propose the use of a set of instruments, Z_i, that are plausibly related to parental talk but orthogonal to adolescent sexual behavior in estimating the following system of equations:

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[6] For example, Cannonier (2012) finds a significant effect of at the state-level on teen childbirth rates with increased funding for abstinence education.

(2) $PT_i = \alpha_1 Z_i + \delta_1 PB_i + \Theta_1 PS_i + \gamma_1' F_i + \beta_1' X_i + s_{1j} + \varepsilon_{1i}$

$R_i = \alpha_2 \hat{PT}_i + \delta_2 PB_i + \Theta_2 PS_i + \gamma_2' F_i + \beta_2' X_i + s_{2j} + \varepsilon_{2i},$

where ε_{1i} and ε_{2i} are both mean zero errors but are presumed to be correlated allowing that $C(\varepsilon_{1i},$ $\varepsilon_{2i}) \neq 0$. We estimate this system using standard Two-Stage Least Squares (2SLS) and refer to the equation predicting parental talk, PT_i, as the "first stage," as is conventional. As specified, this system of equations amounts to an instrumental variables approach that allows for school fixed effects in predicting parental talk behavior as well as in adolescent sexual behavior.

II.   Data

The AddHealth is a nationally-representative survey of roughly 90,000 adolescents who were in 7th through 12th grade during the 1994-95 academic year. Our data derive from wave one of the study when both students and parents were asked about the adolescent's health, relationships, family setting and socioeconomic background, as well as school and neighborhood characteristics. Since the vast majority of parent respondents are mothers and very few are fathers, we chose to focus on mother-daughter interactions as cross-gender communication may be of a different nature (e.g., less likely to occur than same-sex communication or more prevalent in single-parent homes). Furthermore, as discussed earlier, adolescent females are more likely to suffer the negative physical and emotional consequences of sexual behavior.

From the 20,745 surveys in wave one of the AddHealth, we deleted all males (11,111) as well as adolescents whose parent survey was completed by someone other than a biological mother (2,440). We limit our analyses to those aged 14 to 18 (dropping 1,255). We eliminated others for missing key variables including parental talk (135), teenage mother (1,764), and other covariates (1,137). Since we used school fixed effects in all but our baseline OLS models, we also eliminated one adolescent because she was the only respondent in her school. We are left

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with 2,858 female adolescents in 129 schools. Our use of the data is straightforward except for the parenting inputs and instruments we specify below.[7]

Index for Parenting Style

Because the AddHealth asked parents a large number of questions that can be construed as relating to their parenting style, we use Multiple Correspondence Analysis (MCA) to create an index of parental strictness or, more generally, parenting style. MCA has recently been used by economists to measure health (Kohn 2012) and is closely related to principal components analysis which is often used by development economists to create indices of socioeconomic status (Vyas and Kumaranayake 2006). MCA reduces the dimensionality of our set of categorical variables that indicate parenting style. It computes weights to maximize the correlation in these data across all the categories. Thus, rather than several potentially highly correlated variables measuring parental leniency, we use one measure that is a combination of all of these.

In Appendix Table I, we present the weights created by MCA in the creation of our parenting index. A negative sign indicates that the factor is correlated with being a lenient parent while a positive sign indicates a more strict parenting style. The signs on our variables are as we might expect. For example, parents who are more likely to supervise their children are stricter and those who allow their daughter to make her own decisions about, say, her curfew are more lenient. We normalize this index to lie between zero and 100.

Specifications for Parental Talk

The empirical results that follow take advantage of the full set of questions asked of the parents of the adolescents in the AddHealth data set about what they have ever discussed with their children regarding sexual activity. One set of questions asks parents about the specific

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[7] Rather than eliminating respondents who are missing income data, we impute income and include a binary variable in the models to indicate these observations.

subject matter of their discussions about sex including: "How much have you and {NAME} talked about his/her having sexual intercourse and:

- the negative or bad things that would happen if she become pregnant (he got someone pregnant)?

- the dangers of getting a sexually transmitted disease?

- the negative or bad impact on his/her social life because he/she would lose the respect of others?

- the moral issues of not having sexual intercourse?

Each response was given on a four-point Likert Scale ranging from "not at all", "somewhat", "a moderate amount," and "a great deal". We have constructed an index by averaging a parent's responses to these four items. Thus, higher values of our index reveal that the mother has talked more extensively with her adolescent about the potential costs or risks of sexual intercourse.

Two additional questions were aimed at the frequency of the parent's discussions with the child about birth control and sex, respectively. Each response was given, again, on the four-point Likert scale described above. Our second index of parental talk combines the talk of risks index with the frequency of these sex-related discussions.

Instruments for Parental Talk

In order for our instruments to be valid, they must influence a mother's decisions about whether to talk with her adolescent daughter about sex but be uncorrelated with the error term in the production function of adolescent sexual activity. Our instruments, found in the parent survey, reflect attributes of the mother rather than of the daughter so as to increase the *a priori* plausibility that the instruments were exogenous to the production of sexual behavior after controlling for other observable factors of the child and family. To capture the general proclivity of the mother to confront issues of concern or generally get involved in her adolescent daughter's

relationships, we identify two instruments. One is a measure of the number of parents of her child's friends to whom the mother has spoken within the last four weeks. The other is an indicator reflecting the likelihood that the mother would speak to a neighbor if that neighbor's child was getting in trouble. The indicator is set equal to 1 if the mother reports that she "probably would" or "definitely would" speak to the neighbor and equals 0 otherwise.

In light of the richness of the AddHealth data and the set of covariates we include in our analyses, we are confident that both the mother's proclivity to confront a neighbor and the extent of her interaction with other parents are exogenous to her daughter's sexual behavior once we account fully for other potentially confounding factors. Identification of those potentially confounding factors is of the utmost importance so as to allow us to explicitly control for those factors and assure the exogeneity of our instruments. Thus, following the advice of Murray (2006), we regress each of our instruments on a large set of independent variables to identify the significant explanatory variables of our instruments. Included in these regressions[8] are a mother's perceptions of the daughter's risk factors, characteristics that potentially increase the cost of confrontation, and factors that might increase the benefits of parental involvement.

Because the mother's proclivity for confrontation/involvement may reflect her assessment of her daughter's general propensity to engage in risky behaviors or the riskiness of the daughter's peer group or environment, we include measures of the mother's perceptions of whether her daughter uses tobacco, drinks, or has friends who are "bad influences." We hypothesize that riskier daughters might incent mothers to talk to more neighbors and other parents.[9] What we find, though, is that none of these perceptions of the mother are significant

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[8] Results available upon request.
[9] It is not clear whether mothers should, in fact, interpret substance use as a warning sign for sexual risky behavior. See Grossman et al. (2004) for evidence that alcohol and marijuana use, for example, may not be causally related to adolescent sexual intercourse.

predictors of the mother' proclivity to confront a neighbor or meet other parents. Thus, it does not appear that our instruments are inadvertently reflecting the daughter's riskiness.

Our analyses identify other factors that are significantly correlated with our instruments. Neighborhoods with less crime, presumably making involvement with neighbors and other parents less costly, are positively correlated with each instrument. The mother's personal belief that it is "most important for a daughter to be well behaved" is positively associated with our instruments as well, perhaps reflecting a correlation between a mother's desire for a well-behaved daughter and the mother's belief in active pursuit of that end. Finally, the daughter's GPA is a significant predictor of both instruments. It is positively correlated with the number of friends' parents the mother has recently met but negatively (though weakly significantly) related to the likelihood the mother would speak to a neighbor. The former seems consistent with the story that a higher GPA indicates enhanced college and/or career opportunities for the daughter that might make the mother's investments more beneficial. The theoretical explanation for the latter result is not clear.

Other factors significantly related to our instruments include indicators that the mother's religion is very important to her, that the mother is not involved in the daughter's school's Parent-Teacher Association, that the child is supervised before school[10], and indicators of rural and urban residency. We include all of these significant predictors of our instruments in both the first and second stages of our 2SLS models (as well as baseline OLS models) so that our instruments cannot be construed as simply mediating the effects of (or, proxying for) other individual, family, or neighborhood characteristics that may influence adolescent sexual behavior.

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[10] Supervision of the adolescent after school and "at bedtime" were not, however, significant predictors of our instruments. Even so, if we include these additional supervision variables in the OLS and 2SLS models that follow, there are no perceptible differences in any of our results.

Moreover, we consider both of our instruments even more plausibly exogenous with the inclusion of the parental strictness index (which captures the direct effect of a mother's level of involvement in her daughter's life) and school fixed effects (which capture some of the social context within which the daughter is making her decisions about risky behavior).

Descriptive Statistics

Table I reports the means and standard deviations for each of the variables in our sample. Approximately 36 percent of our sample has had sexual intercourse, 9 percent have had unsafe sex, and 20 percent have engaged in casual sex.

In Table I we also report the percent of females in a group identified by one variable (e.g., teenage mother, age 18, Black, or only child) who have had sex. These percentages can be compared informally to the percent of all females who have had sex to get an idea of correlations between observed characteristics of adolescents and the propensity to have sex. Finally, the table also displays means within two segments of our sample, those who have not had sex and those who have, and denotes statistically significant differences in the means across groups. While we focus on parenting inputs in our discussion of results, we provide a full set of summary statistics associated with all our variables (as well as estimated coefficients in the baseline OLS model) to reveal the extensiveness of our covariate list and underscore the importance of these variables as controls in our model.

III.   Results

We present our results in two separate tables within which individual columns report the results of identical empirical specifications but with different dependent variables and/or a different measure of parental talk. Each model controls for a full set of covariates as noted and

allows for standard errors that are clustered at the school level to account for arbitrary heteroskedasticity as well as potentially correlated errors between students within a school.

OLS Regressions

Table II reports the estimated OLS coefficients for female adolescents from models of sexual intercourse, unsafe sex, and casual sex. Adolescents whose mothers were teenagers when they gave birth to their first child are more likely to have had sex (approximately 9 percentage points) and engaged in casual sex (about 8 percentage points). This is consistent with the findings of other researchers (e.g., East et al., 2007). Stricter parenting is negatively associated with all three activities, a result also suggested by Longmore et al., (2001). Both measures of parental talk, however, appear to increase the probabilities that female adolescents have had sex, unsafe sex, and casual sex. Taken as a whole, these results suggest that adolescents who have had more discussions with their mothers about more sex-related topics and/or with more frequency are more likely to have had sex and more likely to engage in risky sex. It is likely that these estimates reflect the endogeneity of parental talk rather than a causal relationship.[11]

Other estimated coefficients are what we might. For example, girls living with only one parent are more likely to engage in these behaviors, a finding established in many previous studies (e.g. Menning et al. 2007, Manlove et al. 2009, Rees et al. 2009, Averett et al. 2011). Girls who have an older sibling or who are only children are also more likely to report having had sexual intercourse as also reported by Argys et al. (2006) and Averett et al. (2011). Consistent with the findings of Manlove et al. (2006) and Manlove et al. (2008) girls whose mothers are more religious are less likely to engage in sexual intercourse. Girls whose mothers supervise them mornings before school are less likely to report having had sex, a result that is consistent with papers like Longmore et al. (2001) and Averett et al. (2011) that find parental

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[11] This positive correlation between talk and adolescent sexual activity corroborates the findings of Khurana and Cooksey (2012) which, like our baseline OLS model, does not deal with the endogeneity of parental talk.

supervision to be an important deterrent to adolescent risky behavior. Hispanic girls are significantly less likely to have had sex, a result comparable to Manlove et al., (2009) and Khurana and Cooksey (2012), and are also less likely to have had casual sex. Girls with more educated parents are less likely to have had sex as has been found by others (e.g. Averett et al. 2011, Manlove et al., 2009). Finally, as common sense would imply, older girls are more likely to have been sexually active.

2SLS Results

As an alternative to the regressions above, we use 2SLS to estimate Model 2. First-stage regression results can be found in Appendix Table II, but the standard first stage F-test and the Hansen's J-statistic for our models are presented in Table III for convenience. Since we employ a pairs of instruments, we note that each of our first stage F-statistics is greater than 11.59, the threshold suggested by Stock and Yogo (2005). Also, our models pass the overidentifying restrictions test (Hansen's J-statistic p-value is well above .10 in all cases), indicating that our instruments are plausibly exogenous and thus legitimately excluded from the second-stage equation.[12]

The first panels of Table III present a summary of the key OLS results for use as a benchmark as well as the coefficients from a simple fixed effects model since students are observed within schools. Panel C of Table III presents results from Model 2, employing instrumental variables and school fixed effects. We focus this discussion on these 2SLS estimates, but provide the simple fixed effects model as another benchmark, ultimately demonstrating that school fixed effects are important but not sufficient in accounting for endogeneity of parental talk.

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[12] The results that follow should be understood to reflect the local average treatment effect (LATE) of talk. We are identifying the effect of talk based on a weighted (according to elasticity of talk with respect to instruments) average of the mothers who are influenced in their talk decision by their willingness to communicate with other parent. Our estimated coefficients on talk in each model should be interpreted as average effects of talk for mother-daughter pairs where the mother is influenced in her amount of talk by the instruments.

As in the OLS results, stricter parenting decreases the probability that an adolescent has had sex, has had unsafe sex, and engaged in casual sex. Teenage mothers have a positive and significant effect on the probabilities the adolescent has had sex and has engaged in casual sex.

Where we see the biggest differences between the 2SLS results and OLS estimates are in the signs and significance of the estimated coefficients on parental talk variables. For each of the three outcomes, regardless of the particular specification of parental talk, the effect of talk on the adolescent's behavior is negative but not statistically significant; that is, there is no significant effect of talk on adolescent sexual risky behavior.[13]

Interactions of Talk and Walk

Panel D of Table III presents results from the same 2SLS model formulation with the addition of an interaction term between walk and talk to capture the potential for a differential effect of a mother's communication about sex if she herself was a teenage mother. While it is tempting to first note the similarities and differences between coefficient estimates across 2SLS models, for example that the coefficient on talk remains insignificant and now the coefficient on teenage mother is also insignificant, it is necessary to examine the linear combination of coefficients in interpreting the interaction results.

Since we have now modeled the effect of walk so that it might differ according to the amount of talk, the marginal effect of walk is found by differentiating the second stage equation of our 2SLS model with respect to walk. We evaluate the derivative at the mean magnitude of

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[13] The AddHealth only surveyed parents in wave one of the study and is therefore of limited use as a panel. Repeated observations of parents in addition to their children would be helpful in examining the dynamics of the mother-daughter relationship and especially the timing of talk relative to sexual initiation or sexual practices. As is, the AddHealth only allows this perspective on a select sample of adolescents – those who have not had sex in the first round of the survey. For these respondents, who by their previous abstinence are demonstrably less likely than the average female to engage in sex, we can more clearly identify the effect of parental talk that occurs *before* sexual initiation with the parent's answers in wave one. In OLS models, parental talk (in wave one) increases the probability that the adolescent has had sex in wave two. After controlling for endogeneity of parental talk using valid instruments, however, all estimated effects of parental talk on sexual outcomes become negative, though not always statistically significant. Admittedly, these results flow from a narrowly selected sample, but what remains clear is that OLS regressions that indicate positive relationships between parental talk and sexual behaviors should not be interpreted causally.

talk and present these in separate row of Panel D. What the marginal effects reflect is that, at the average level of talk, being a teen mom is generally not an important predictor of adolescent sex. The marginal effect is only weakly significant and positive for the models predicting sexual intercourse and casual sex as functions of talk of risks surrounding sex. The marginal effect is never significant in models employing the broader measure of talk.

To properly understand the marginal effect of talk, we must consider whether the mother had a child as a teenager. For non-teen moms, the effect of talk is found in the coefficient on talk alone. As in our other 2SLS models, talk is not a statistically significant predictor of any of the adolescent outcomes. For teen mothers, though, we have to consider the sum of the coefficients on talk and on the interaction term. The sums are provided in Panel D with stars denoting whether the sum is significantly different from zero at any of the conventional levels. Notice, when it comes to adolescents having had sex, more talk predicts a greater probability that the daughter had sex in cases where the mother was a teen mother. For these same mothers/daughters, talk neither increases nor decreases the predicted outcome unsafe or casual sex. Overall, a mother's own experience with teen pregnancy has an important influence on the impact of her discussions on her daughter's outcomes. This suggests that for teen mothers, more talk may be detrimental, and it is apparently important to "walk the talk."

Both the marginal effect of walk and the marginal effect of talk illuminate some complementarities between parental investments but they also raise some important directions for future research. Namely, what are mothers saying, how are they saying it, and what heterogeneous effects might they produce? We cannot, at this point, rule out the possibility that the nature of conversations with teen mothers compared to mothers who were older at first birth are fundamentally different and that these differences underlie the average treatment effect we uncover here, for example.

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IV. Conclusions

Our results suggest that, whatever the measure of parental talk, it is positively correlated with greater prevalence of adolescent sexual activity, unsafe sex, and casual sex in naïve models that do not take into account the potential endogeneity of such conversations. However, with the use of valid instruments for parental talk, we find that parental talk has no statistically significant effect on female adolescent sexual initiation, unsafe sex, or casual sex while parental strictness appears to reduce these behaviors and having a teenage mother may increase these activities. With the addition of an interaction term between parental talk and parental walk however, we find that high levels of talk may increase adolescent sexual risky behavior among daughters whose mothers weren't themselves teen mothers. It appears it is indeed important to have "walked the talk," as mothers who had a child in their teen years and who talk more have daughters who are more likely to have engaged in sex.

Our findings underscore the importance of not basing policy decisions on OLS models or correlations that are not well understood by policymakers. Raw statistics and basic regressions that naively compare outcomes of adolescents who have received more or less "talk" appear to support what might be no more than a persistent old wives' tale: that discussions about sex with adolescents could actually encourage, legitimize, or facilitate related risky behaviors. Taking into account unobservable factors correlated with parental talk and adolescent sexual activity provides a much different story and a more accurate estimate of the causal effect of such conversations.

Table I: Summary Statistics

	Percent in Category Who Have Had Sex	All N=2858				Have Not Had Sex N=1827		Have Had Sex N=1031		Significant Difference?
		Mean	**Std Dev**	**Min**	**Max**	**Mean**	**Std Dev**	**Mean**	**Std Dev**	
DEPENDENT VARIABLES:										
Has Had Sex		**0.361**	**(0.480)**	**0**	**1**					
Unsafe Sex		**0.094**	**(0.292)**	**0**	**1**					
Casual Sex		**0.198**	**(0.007)**	**0**	**1**	0.035	(0.004)	0.488	(0.016)	***
WALK:										
Mom a Teenage Mother	50.5%	0.177	(0.381)	0	1	0.136	(0.343)	0.248	(0.432)	***
TALK:										
Talk about risks of sex		3.074	(0.797)	1	4	2.976	(0.810)	3.247	(0.742)	***
Frequency of talk and risks		3.032	(0.761)	1	4.17	2.915	(0.765)	3.240	(0.708)	*
PARENTING:										
Parenting index (strictness)		27.553	(17.869)	0	100	29.446	(16.433)	24.197	(15.435)	***
INSTRUMENTS:										
Number of child's friend's parents talked with		2.268	(1.950)	0	6	2.404	(2.007)	2.028	(1.821)	*
Report to neighbor about child		0.818	(0.386)	0	1	0.814	(0.389)	0.826	(0.379)	
COVARIATES:										
No Religion	48.8%	0.101	(0.302)	0	1	0.081	(0.273)	0.137	(0.344)	***
Catholic	29.6%	0.275	(0.447)	0	1	0.303	(0.460)	0.226	(0.418)	***
Black	46.3%	0.216	(0.411)	0	1	0.181	(0.385)	0.276	(0.447)	***
Other race	30.3%	0.051	(0.219)	0	1	0.055	(0.229)	0.043	(0.202)	
Hispanic	26.6%	0.135	(0.342)	0	1	0.155	(0.362)	0.100	(0.300)	***
Urban	38.3%	0.350	(0.477)	0	1	0.338	(0.473)	0.371	(0.483)	*
Rural	36.2%	0.268	(0.443)	0	1	0.268	(0.443)	0.270	(0.444)	
One parent family	47.8%	0.260	(0.439)	0	1	0.212	(0.409)	0.344	(0.475)	***
Two parents, one not biological	37.5%	0.056	(0.230)	0	1	0.055	(0.228)	0.058	(0.234)	
Other Family	60.0%	0.003	(0.059)	0	1	0.002	(0.047)	0.006	(0.076)	
Parent some college°	40.3%	0.224	(0.417)	0	1	0.209	(0.407)	0.250	(0.433)	**
Parent high school°	42.1%	0.271	(0.444)	0	1	0.245	(0.430)	0.316	(0.465)	***
Parent less than high school°	39.4%	0.096	(0.294)	0	1	0.091	(0.287)	0.105	(0.306)	
Don't know parent education°	30.6%	0.017	(0.130)	0	1	0.019	(0.135)	0.015	(0.120)	
Parent on welfare	41.1%	0.100	(0.301)	0	1	0.093	(0.290)	0.114	(0.319)	*
Income in 1994		44.084	(51.618)	0	999	45.838	(54.239)	40.976	(46.474)	**
Don't know parent income	30.3%	0.117	(0.321)	0	1	0.127	(0.333)	0.098	(0.297)	**
Older sibling	35.4%	0.558	(0.497)	0	1	0.564	(0.496)	0.548	(0.498)	
Only child	60.0%	0.010	(0.102)	0	1	0.007	(0.081)	0.017	(0.131)	*
Two children in HH	37.0%	0.471	(0.499)	0	1	0.465	(0.499)	0.483	(0.500)	
Three children in HH	37.7%	0.318	(0.466)	0	1	0.310	(0.463)	0.333	(0.471)	
Mother's age		41.254	(4.890)	24	60	41.409	(4.885)	40.979	(4.890)	**
Mom is not in PTA	39.3%	0.365	(0.4810)	0	1	0.602	(0.489)	0.692	(0.462)	***
PTA unknown	36.3%	0.007	(0.087)	0	1	0.007	(0.087)	0.007	(0.088)	
GPA		2.907	((0.745)	1	4	3.026	(0.728)	2.697	(0.728)	***
GPA missing	61.4%	0.024	(0.154)	0	1	0.014	(0.121)	0.042	(0.200)	***
Religion very important to mother	34.4%	0.613	(0.487)	0	1	0.628	(0.483)	0.585	(0.493)	***
Live in neighborhood due to less crime	34.0%	0.590	(0.492)	0	1	0.609	(0.487)	0.557	(0.497)	***
Unknown if live in neighborhood b/c of crime	43.2%	0.012	(0.113)	0	1	0.011	(0.106)	0.015	(0.123)	
Parent supervises adolescent before school	34.2%	0.843	(0.362)	0	1	0.868	(0.337)	0.800	(0.400)	***
Age 14	15.9%	0.202	(0.008)	0	1	0.265	(0.010)	0.089	(0.009)	***
Age 15	26.8%	0.255	(0.436)	0	1	0.292	(0.455)	0.189	(0.392)	***
Age 16	40.2%	0.230	(0.421)	0	1	0.215	(0.411)	0.256	(0.437)	**
Age 17	51.2%	0.194	(0.396)	0	1	0.148	(0.356)	0.275	(0.447)	***
Age 18	57.5%	0.119	(0.324)	0	1	0.079	(0.270)	0.190	(0.393)	***

° The control variables for parental education are mutually exclusive and represent the highest level of education completed by either parent. The excluded category is "at least one parent has a college degree." We include an indicator for adolescents who do not know both parents' education.

*** p<0.01, ** p<0.05, * p<0.1

Table II: Ordinary Least Squares

Variable	Has Had Sex N=2858		Unsafe Sex N=2069		Casual Sex N=2852	
Talk about risks of sex	0.0630***		0.0302***		0.0262***	
	(0.010)		(0.007)		(0.009)	
Frequency of talk and risks		0.0812***		0.0339***		0.0338***
		(0.011)		(0.008)		(0.010)
Mom a Teenage Mother	0.0930***	0.0906***	0.0250	0.0249	0.0767***	0.0757***
	(0.031)	(0.031)	(0.025)	(0.025)	(0.029)	(0.029)
Parenting index (strictness)	-0.0021***	-0.0021***	-0.0013***	-0.0013***	-0.0016***	-0.0015***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
No Religion	0.0793**	0.0757**	0.1057***	0.1043***	0.0466	0.0452
	(0.031)	(0.030)	(0.031)	(0.031)	(0.030)	(0.030)
Catholic	-0.0172	-0.0167	-0.0241*	-0.0244*	0.0017	0.0019
	(0.021)	(0.021)	(0.013)	(0.013)	(0.017)	(0.017)
Black	0.0447*	0.0419*	-0.0263*	-0.0273*	0.0363*	0.0351*
	(0.023)	(0.023)	(0.016)	(0.016)	(0.021)	(0.021)
Other race	0.0466	0.0446	-0.0336**	-0.0341**	-0.0107	-0.0116
	(0.032)	(0.032)	(0.017)	(0.017)	(0.027)	(0.026)
Hispanic	-0.1499***	-0.1418***	-0.0064	-0.0038	-0.1100***	-0.1066***
	(0.029)	(0.029)	(0.026)	(0.026)	(0.025)	(0.025)
Urban	0.0237	0.0229	0.0105	0.0108	-0.0088	-0.0092
	(0.019)	(0.019)	(0.013)	(0.013)	(0.017)	(0.017)
Rural	0.0273	0.0276	-0.0012	-0.0007	0.0151	0.0152
	(0.022)	(0.022)	(0.015)	(0.015)	(0.021)	(0.021)
One parent family	0.0676***	0.0634***	0.0298*	0.0284*	0.0402**	0.0385**
	(0.021)	(0.021)	(0.016)	(0.016)	(0.017)	(0.017)
Two parents, one not bio	-0.0024	-0.0054	-0.0039	-0.0049	0.0597	0.0585
	(0.033)	(0.033)	(0.028)	(0.028)	(0.038)	(0.038)
Other Family	-0.0082	0.0012	-0.1520**	-0.1432**	0.0484	0.0523
	(0.107)	(0.105)	(0.068)	(0.068)	(0.152)	(0.152)
Parent some college	0.0444**	0.0424*	0.0218	0.0215	0.0433**	0.0425**
	(0.022)	(0.022)	(0.016)	(0.016)	(0.019)	(0.019)
Parent high school	0.0513**	0.0502**	0.0193	0.0194	0.0213	0.0208
	(0.020)	(0.020)	(0.017)	(0.017)	(0.020)	(0.020)
Parent less than high school	0.0422	0.0418	0.0261	0.0255	0.0346	0.0344
	(0.031)	(0.031)	(0.029)	(0.029)	(0.034)	(0.034)
Don't know parent educ.	0.0009	0.0046	0.0407	0.0426	-0.0365	-0.0350
	(0.072)	(0.072)	(0.054)	(0.054)	(0.051)	(0.051)
Parent on welfare	-0.0187	-0.0199	-0.0190	-0.0200	-0.0297	-0.0301
	(0.033)	(0.033)	(0.026)	(0.026)	(0.031)	(0.031)
Income in 1994	-0.0000	-0.0000	-0.0001	-0.0001	0.0003	0.0003
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Don't know parent income	-0.0500***	-0.0484**	-0.0102	-0.0100	-0.0100	-0.0094
	(0.019)	(0.019)	(0.019)	(0.019)	(0.021)	(0.021)

Table II: Ordinary Least Squares, cont.

Variable	Has Had Sex N=2858		Unsafe Sex N=2069		Casual Sex N=2852	
Has an older sibling	0.0340*	0.0340*	0.0016	0.0016	0.0232	0.0232
	(0.020)	(0.020)	(0.016)	(0.016)	(0.018)	(0.018)
Is an only child	0.2225***	0.2142**	0.1257	0.1216	0.1586**	0.1552**
	(0.085)	(0.085)	(0.135)	(0.135)	(0.077)	(0.077)
Two child family	0.0852***	0.0824***	0.0234	0.0226	0.0675***	0.0663***
	(0.022)	(0.022)	(0.016)	(0.015)	(0.019)	(0.019)
Three child family	0.0841***	0.0831***	0.0414**	0.0412**	0.0696***	0.0692***
	(0.026)	(0.026)	(0.018)	(0.018)	(0.021)	(0.021)
Mother's age	-0.0025	-0.0021	-0.0019	-0.0018	-0.0000	0.0002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Mother not in PTA	0.0096	0.0099	0.0014	0.0016	0.0091	0.0092
	(0.018)	(0.018)	(0.013)	(0.013)	(0.014)	(0.014)
Unknown if in PTA	-0.0034	0.0011	-0.1164***	-0.1131***	0.0061	0.0079
	(0.101)	(0.100)	(0.038)	(0.038)	(0.080)	(0.080)
GPA	-0.1090***	-0.1066***	-0.0502***	-0.0497***	-0.0912***	-0.0902***
	(0.013)	(0.013)	(0.011)	(0.011)	(0.011)	(0.011)
GPA missing	0.1412**	0.1432**	0.1321*	0.1321*	0.0782	0.0788
	(0.062)	(0.062)	(0.076)	(0.076)	(0.055)	(0.055)
Religion very imp to mother	-0.0313*	-0.0311*	0.0054	0.0064	-0.0078	-0.0077
	(0.018)	(0.018)	(0.015)	(0.015)	(0.015)	(0.015)
Like neighborhood b/c less crime	-0.0144	-0.0159	-0.0184	-0.0189	0.0136	0.0130
	(0.017)	(0.016)	(0.013)	(0.013)	(0.015)	(0.015)
Unknown if less crime	0.0627	0.0590	0.0579	0.0564	0.0691	0.0676
	(0.080)	(0.079)	(0.065)	(0.064)	(0.067)	(0.066)
Parent supervises before school	-0.0507*	-0.0508*	-0.0433*	-0.0436*	-0.0302	-0.0302
	(0.027)	(0.026)	(0.025)	(0.025)	(0.026)	(0.026)
Age 15	0.0918***	0.0900***	0.0221*	0.0221*	0.0280	0.0273
	(0.022)	(0.022)	(0.013)	(0.012)	(0.018)	(0.018)
Age 16	0.2172***	0.2128***	0.0573***	0.0562***	0.0795***	0.0777***
	(0.025)	(0.025)	(0.018)	(0.018)	(0.022)	(0.022)
Age 17	0.3232***	0.3190***	0.0887***	0.0883***	0.1401***	0.1384***
	(0.027)	(0.026)	(0.019)	(0.019)	(0.025)	(0.024)
Age 18	0.3992***	0.3938***	0.1327***	0.1311***	0.1170***	0.1147***
	(0.027)	(0.027)	(0.029)	(0.029)	(0.029)	(0.029)
Constant	0.3725***	0.3022***	0.2235**	0.2094**	0.2496**	0.2201**
	(0.113)	(0.114)	(0.087)	(0.087)	(0.098)	(0.099)
N	2,858	2,858	2,069	2,069	2,852	2,852
R-squared	0.211	0.216	0.103	0.104	0.105	0.106

Notes: The benchmark adolescent is white, 14 years old, lives in the suburbs with both of her biological parents and four or more siblings, has a religion other than Catholicism, and has at least one parent with a college degree. (See note about parent education following Table I.) Robust (clustered) standard errors in parentheses. 129 schools (clusters).
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table III: School Fixed Effects and 2SLS

Variable	Has Had Sex N=2858		Unsafe Sex N=2069		Casual Sex N=2852	
Panel A: OLS (same as Table II)						
Talk about risks of sex	0.0630***		0.0302***		0.0262***	
	(0.010)		(0.007)		(0.009)	
Frequency of talk and risks		0.0812***		0.0339***		0.0338***
		(0.011)		(0.008)		(0.010)
Mom a Teenage Mother	0.0930***	0.0906***	0.0250	0.0249	0.0767***	0.0757***
	(0.031)	(0.031)	(0.025)	(0.025)	(0.029)	(0.029)
Parenting index (strictness)	-0.0021***	-0.0021***	-0.0013***	-0.0013***	-0.0016***	-0.0015***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Panel B: School Fixed Effects Regression						
Talk about risks of sex	0.0545***		0.0274***		0.0226**	
	(0.010)		(0.008)		(0.009)	
Frequency of talk and risks		0.0721***		-.0317***		0.0302***
		(0.011)		(0.009)		(0.010)
Mom a Teenage Mother	0.0750**	0.0725**	0.0276	0.0274	0.0662**	0.0652**
	(0.033)	(0.033)	(0.026)	(0.026)	(0.030)	(0.030)
Parenting index (strictness)	-0.0022***	-0.0021***	-0.0013***	-0.0013***	-0.0016***	-0.0015***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Panel C: 2SLS (including School Fixed Effects)						
Talk about risks of sex	-0.0421		-0.0910		-0.0766	
	(0.088)		(0.067)		(0.073)	
Frequency of talk and risks		-0.0453		-0.0990		-0.0794
		(0.090)		(0.070)		(0.074)
Mom a Teenage Mother	0.0886**	0.0891**	0.0419	0.0419	0.0799**	0.0803***
	(0.035)	(0.035)	(0.027)	(0.027)	(0.031)	(0.031)
Parenting index (strictness)	-0.0022***	-0.0022***	-0.0014***	-0.0015***	-0.0016***	-0.0016***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
p-value from Hansen J-test	0.659	0.673	0.426	0.460	0.893	0.920
F-test from first-stage	23.29	26.35	16.60	17.26	22.51	25.58
Panel D: 2SLS with Interactions of Walk and Talk (including School Fixed Effects)						
Talk about risks of sex	-0.0637		-0.1163		-0.0890	
	(0.093)		(0.073)		(0.078)	
Frequency of talk and risks		-0.0730		-0.1259*		-0.0948
		(0.096)		(0.076)		(0.079)
Teenage Mom × Talk Freq	0.1360		0.1420**		0.1118	
	(0.087)		(0.072)		(0.074)	
Teenage Mom × Talk Risks		0.1735*		0.1623**		0.1300*
		(0.090)		(0.075)		(0.074)
Mom a Teenage Mother	-0.3597	-0.4771*	-0.4148*	-0.4700**	-0.2894	-0.3446
	(0.272)	(0.277)	(0.228)	(0.231)	(0.242)	(0.237)
Parenting index (strictness)	-0.0022***	-0.0023***	-0.0014***	-0.0015***	-0.0016***	-0.0016***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Marg. Eff. of Talk (teen moms)	0.0723***	0.1005***	0.0257	0.0364	0.0228	0.0352
Marg. Eff. of Walk (at avg. talk)	0.0583*	0.0491	0.0215	0.0220	0.0543*	0.0496
p-value from Hansen J-test	0.834	0.897	0.677	0.768	0.922	0.865
F-test on First Stage	21.30	22.48	14.38	15.25	20.80	22.08

Notes: Models include full set of covariates. For other notes, see Table II.
*** p<0.01, ** p<0.05, * p<0.1

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Appendix Table I
Results from MCA Analysis of Parenting Style

Variable	Categorical Response	MCA Weight*	Percent Responding "Yes"
Mom lets daughter decide on curfew	No	0.509	28.7%
	Yes	-1.264	
Mom lets daughter decide who to hang out with	No	3.170	87.1%
	Yes	-0.471	
Mom lets daughter decide what to wear	No	4.632	92.1%
	Yes	-0.396	
Mom lets daughter decide how much TV to watch	No	3.668	85.2%
	Yes	-0.639	
Mom lets daughter decide weeknight bedtime	No	2.936	80.2%
	Yes	-0.722	
Mom lets daughter decide what to eat	No	2.003	71.6%
	Yes	-0.794	
Mom never drinks alcohol	No	-0.418	41.7%
	Yes	0.583	
Mom feels having a well behaved daughter is most important quality	No	-0.261	21.8%
	Yes	0.939	
A parent supervises daughter before bed	No	-1.125	95.9%
	Yes	0.048	
A parent supervises daughter after school	No	-0.742	58.0%
	Yes	0.538	
A parent supervised daughter before school	No	-0.434	84.4%
	Yes	0.080	

*Positive Weights Indicate Stricter Parenting

First Stage Results from 2SLS with School Fixed Effects

	Has Had Sex N=2858		Unsafe Sex N=2069		Casual Sex N=2852	
Instrumenting for:	*Risk Talk*	*Talk Freq*	*Risk Talk*	*Talk Freq*	*Risk Talk*	*Talk Freq*
INSTRUMENTS:						
# of child's friend's parents talked with	0.045***	0.044***	0.045***	0.044***	0.044***	0.044***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Report to neighbor about child	0.124***	0.112***	0.123**	0.106**	0.123***	0.112***
	(0.04)	(0.03)	(0.04)	(0.04)	(0.04)	(0.03)
Parenting index (strictness)	0.000	-0.001	-0.000	-0.001	0.000	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Mom a Teenage Mother	0.134**	0.134**	0.122	0.111	0.131**	0.131**
	(0.05)	(0.05)	(0.07)	(0.06)	(0.05)	(0.05)
No Religion	0.015	0.049	0.033	0.054	0.010	0.044
	(0.05)	(0.05)	(0.07)	(0.06)	(0.05)	(0.05)
Catholic	-0.009	-0.006	0.009	0.019	-0.011	-0.008
	(0.05)	(0.04)	(0.06)	(0.05)	(0.05)	(0.04)
Black	0.261***	0.264***	0.284***	0.300***	0.265***	0.267***
	(0.06)	(0.06)	(0.08)	(0.07)	(0.06)	(0.06)
Other race	-0.012	0.021	0.010	0.026	-0.010	0.023
	(0.07)	(0.06)	(0.08)	(0.07)	(0.07)	(0.06)
Hispanic	0.002	-0.057	-0.059	-0.106	-0.000	-0.059
	(0.07)	(0.07)	(0.08)	(0.08)	(0.07)	(0.07)
Urban	0.052	0.050	0.088*	0.078	0.055	0.053
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Rural	0.015	0.002	0.034	0.019	0.012	0.000
	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)	(0.04)
One parent family	0.101**	0.125***	0.092	0.116*	0.100**	0.125***
	(0.04)	(0.04)	(0.05)	(0.05)	(0.04)	(0.04)
Two parents, one not bio	0.112*	0.119*	0.123	0.136*	0.108*	0.116*
	(0.05)	(0.05)	(0.07)	(0.07)	(0.05)	(0.05)
Other Family	0.099	-0.039	0.145	-0.127	0.098	-0.039
	(0.18)	(0.16)	(0.14)	(0.15)	(0.18)	(0.16)
Parent some college	0.115**	0.115**	0.097*	0.103*	0.116**	0.116**
	(0.04)	(0.03)	(0.05)	(0.05)	(0.04)	(0.03)
Parent high school	0.120**	0.104**	0.145**	0.130**	0.123**	0.108**
	(0.04)	(0.04)	(0.05)	(0.05)	(0.04)	(0.04)
Parent less than high school	0.084	0.078	0.115	0.126	0.093	0.088
	(0.07)	(0.07)	(0.09)	(0.08)	(0.07)	(0.07)
Don't know parent educ.	-0.062	-0.078	0.009	-0.043	-0.059	-0.074
	(0.12)	(0.11)	(0.13)	(0.12)	(0.12)	(0.11)
Parent on welfare	-0.153**	-0.106*	-0.126*	-0.079	-0.157**	-0.111*
	(0.05)	(0.05)	(0.06)	(0.06)	(0.05)	(0.05)

Notes: The benchmark adolescent is white, 14 years old, lives in the suburbs with both of her biological parents and four or more siblings, has a religion other than Catholicism, and has at least one parent with a college degree. Robust (clustered) standard errors in parentheses. 129 schools (clusters).
*** p<0.01, ** p<0.05, * p<0.1

Appendix Table II, cont.
First Stage Results from 2SLS with School Fixed Effects

	Has Had Sex N=2858		Unsafe Sex N=2069		Casual Sex N=2852	
Instrumenting for:	*Risk Talk*	*Talk Freq*	*Risk Talk*	*Talk Freq*	*Risk Talk*	*Talk Freq*
Income in 1994	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Don't know parent income	-0.035	-0.043	-0.081	-0.080	-0.037	-0.044
	(0.05)	(0.05)	(0.06)	(0.06)	(0.05)	(0.05)
Older sibling	-0.053	-0.044	-0.085	-0.076	-0.052	-0.043
	(0.04)	(0.03)	(0.04)	(0.04)	(0.04)	(0.03)
Only child	-0.021	0.093	-0.222	-0.075	-0.018	0.095
	(0.11)	(0.10)	(0.15)	(0.15)	(0.11)	(0.10)
Two children in HH	0.009	0.029	-0.021	-0.000	0.013	0.032
	(0.04)	(0.04)	(0.05)	(0.05)	(0.04)	(0.04)
Three children in HH	-0.020	-0.015	-0.021	-0.014	-0.018	-0.014
	(0.04)	(0.04)	(0.05)	(0.05)	(0.04)	(0.04)
Mother's Age	-0.010*	-0.011*	-0.005	-0.007	-0.010*	-0.012*
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)
Not in PTA	0.002	0.005	-0.039	-0.037	0.002	0.006
	(0.04)	(0.03)	(0.05)	(0.04)	(0.04)	(0.03)
PTA unknown	0.037	-0.053	-0.074	-0.184	0.039	-0.052
	(0.16)	(0.18)	(0.22)	(0.23)	(0.16)	(0.18)
GPA	-0.117***	-0.123***	-0.100**	-0.106**	-0.117***	-0.123***
	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)	(0.03)
GPA missing	-0.047	-0.056	-0.097	-0.085	-0.017	-0.028
	(0.09)	(0.08)	(0.12)	(0.10)	(0.09)	(0.07)
Religion very imp to mom	0.151***	0.112**	0.141**	0.100*	0.149***	0.111**
	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)	(0.04)
Less Crime	0.085*	0.081*	0.073*	0.079*	0.088*	0.084*
	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)	(0.03)
Less Crime unknown	0.052	0.088	-0.075	-0.033	0.054	0.090
	(0.11)	(0.11)	(0.13)	(0.13)	(0.11)	(0.11)
Parent supervises before school	0.067	0.053	0.015	0.024	0.071	0.058
	(0.04)	(0.03)	(0.05)	(0.05)	(0.04)	(0.03)
Age 15	0.090	0.083	0.116*	0.102*	0.090	0.084
	(0.05)	(0.05)	(0.06)	(0.05)	(0.05)	(0.05)
Age 16	0.031	0.077	0.039	0.072	0.031	0.076
	(0.06)	(0.05)	(0.07)	(0.06)	(0.06)	(0.05)
Age 17	0.139*	0.155**	0.158*	0.153*	0.139*	0.155**
	(0.06)	(0.05)	(0.06)	(0.06)	(0.06)	(0.05)
Age 18	0.030	0.089	0.011	0.065	0.035	0.094
	(0.06)	(0.06)	(0.08)	(0.07)	(0.06)	(0.06)

Notes: The benchmark adolescent is white, 14 years old, lives in the suburbs with both of
her biological parents and four or more siblings, has a religion other than Catholicism,
and has at least one parent with a college degree. Robust (clustered) standard errors in
parentheses. 129 schools (clusters).
*** p<0.01, ** p<0.05, * p<0.1