# Is it Necessary to Walk the Talk? The Effects of Parental Experiences and Communication on Adolescent Sexual Behavior

## Extended Abstract

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**Abstract** Recent social marketing campaigns exhort parents to talk to their children about drug and alcohol use and/or sexual abstinence. The efficacy of such campaigns is difficult to ascertain, however, if parents are more likely to broach these 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. This research aims to separately identify the effects of parenting style, a parent's own risky behavior, and the parent's communication about risky behavior on her adolescent's sexual behavior.

Adolescent substance use and risky sexual behavior have been a concern of parents and policy makers for decades. Recent social marketing campaigns, such as The Partnership for a Drug Free America's TimeToTalk and The Department of Health and Human Services' 4Parents.gov, exhort parents to talk to their children about drug and alcohol use and/or sexual abstinence (see for example: http://www.timetotalk.org/). The efficacy of these campaigns is difficult to ascertain because those parents who are most likely to talk to their adolescents about these issues may also be those who have the most reason to be concerned about their child's behavior. Extant research in this area has not been able to separately control for various aspects of parenting that might also be confounded with the influence of the marketing campaigns.

In this research, we use data from two waves of the Adolescent Health Survey (AddHealth) to examine the influence that parent-child discussions (hereafter, parental "talk"), parenting style and parent behaviors (parental "walk") have on an adolescent's decision to engage in sexual intercourse. Our work improves on previous work in this area in three ways. First, we can control for unobservable school influences by using school fixed-effects. While many factors of schools that influence adolescent outcomes are unobserved by econometricians,

they are likely to be observed by parents and, thus, potentially correlated with parental talk. Second, we use multiple correspondence analysis (MCA) to create a parenting style index of permissiveness/strictness. MCA reduces the number of explanatory variables in our models while maintaining important variation in parental behavior reported in AddHealth's myriad questions about parental activities and approaches to childrearing. Third, our data allow us to measure the effect of what parents say to their teens about sex on the teen's propensity to engage in sexual intercourse while holding constant parenting style, school influences and the parent's own behavior. Thus, ours is the first research to isolate the effect of parental talk from other aspects of parenting.

As suggested by the campaigns urging parents to talk to their kids, there is basic evidence that parent behavior is related to adolescent behavior. In Table 1 below, we report the percent of adolescents who engage in sexual intercourse within each category defined by adolescent gender and whether the adolescent's parent was a teenage mother (our measure of parental walk). These raw tabulations indicate that, in fact, teens who had mothers who were teenage parents are more likely to have engaged in sexual intercourse. Of course, these raw correlations are not adjusted for other factors.

**Table 1: Percent of Adolescents who are Sexually Active, by Teenage Mother**

| | **Male** | **Female** |
|---|---|---|
| Not a Teenage Mother | 40.1% | 37.2% |
| Teenage Mother | 50.1% | 48.9% |

Our preliminary measure of parent talk indicates whether the parent responds that she talks to her adolescent about sex. Table 2 shows the percent of teenagers within a category, defined by parent walk and talk, who engage in sexual intercourse.

**Table 2: Propensity of Adolescents who are Sexually Active, Interactions of Walk and Talk**

| | Not a Teenage Mother | Teenage Mother |
|---|---|---|
| Does not Talk | 28.4% | 43.2% |
| Does Talk | 39.4% | 51.9% |

From these raw statistics, it appears that adolescents with parents who talk to them about sex or whose mothers had children as teenagers are more likely to engage in sexual intercourse. Furthermore, the combination of both suggests the highest propensity for adolescent sexual activity.

Future analyses will take advantage of the full set of questions asked to the parents of the adolescents in the AddHealth data set about what they talked to their children about regarding sexual activity. In particular, a parent (usually the mother) was asked four questions about "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?

and two additional questions regarding the frequency of the parent's discussions with the child about birth control and about sex. Each response was on a four point Likert scale ranging from "not at all" (indicating that no discussion of this topic had occurred) to "a great deal." Thus,

higher values of our index indicate that the parent has talked more extensively with their adolescent about these issues.

Our concept of parental talk is novel in the social science literature, although numerous studies have explored somewhat related issues. 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 or improper behavior.

Social scientists have empirically examined the relationship between parental supervision after school and several behavioral outcomes. Using data on 9$^{th}$ graders, Richardson et al. (1993) found that substance use and other risky behaviors were highest for students with no adult supervision after school. Vandall and Ramanan (1991) examined behavior problems indices for 5$^{th}$ graders. They concluded that behavior problems were more pronounced for children who returned to an empty home after school as compared to those whose mothers were at home or those who were supervised by another adult.

Expressing concern that the findings described above might be endogenous if levels of supervision are driven by unobservable parent characteristics, Aizer (2004) more recently examined the relationship between parental supervision and behavior. With the inclusion of family fixed effects to control for unobservable factors that might affect both parental supervision and the behavior of children aged 10 to 14 years, she found that an increase in adult supervision after school was associated with reductions in truancy, alcohol and marijuana use, theft, and fighting among school-age children. Averett et al. (in press) examined the effect of

birth order and parental supervision on adolescent risky behavior and found that parental supervision is an important deterrent to risky adolescent behavior.

However, there is little empirical research in adolescent risky behavior on parental inputs other than basic parent characteristics and supervision and even less research that focuses on uncovering the causal relationship between parenting activities and adolescent outcomes. If a parent expects risky behavior from her child, 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 forcefully. If a parent foresees negative influences from her adolescent's peer group, she may increase her efforts to discuss risky behaviors with her child. If any or all of these potential scenarios is true, a simple production function of adolescent risky behavior will return biased estimates of the true effect of parental talk.

**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 or, in other words, 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 his parent, an adolescent maximizes his utility over choices of risky behaviors. In this

research we estimate reduced form models of the adolescent risky-behavior, specifically sexual intercourse, production function 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.

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

$$(1) \qquad R_{it}^{*} = \alpha PT_{it} + \delta PB_{it} + \Theta PS_{i} + \gamma' F_{it} + \beta' X_{it} + \varepsilon_{it},$$

where $PT_{it}$ is a dichotomous variable equal to 1 if the adolescent's parent reports talking to the adolescent about sex at time t, $PB_{it}$ 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. $F_{it}$ is a vector of family size dummy variables that includes an indicator for whether the respondent was an only child and the respondent's birth order; and the vector $X_{it}$ contains controls such as age, sex, race, ethnicity, and measures of socioeconomic status. $R_{it}^{*}$ is a latent variable representing an adolescent's unobserved propensity to engage sexual activity at time t. When $R_{it}^{*} > 0$ an indicator variable, $R_{it}$, is observed to be equal 1, so that: Prob ($R_{it} = 1$) = Prob($\alpha PT_{it} + \delta PB_{it} + \gamma' F_{it} + \beta' X_{it} + \varepsilon_{it} > 0$). If $\varepsilon_{it}$ is normally distributed, then this equation can be estimated as a standard univariate probit model.

**Empirical Contributions and Extensions**

The AddHealth's school based sampling design allows us to identify multiple adolescents in many schools. Thus, we can further refine our model to portion out the variation in adolescent

behavior due to unobserved factors of the adolescent's school. Adding school fixed effects, denoted $s_i$, we obtain the following model:

$$(2) \qquad R_{it}^{*} = \alpha PT_{it} + \delta PB_{it} + \Theta PS_i + \gamma' F_{it} + \beta' X_{it} + s_i + \varepsilon_{it}.$$

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). Controlling for these factors is especially important in the context of our research question in order to eliminate 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. If positive school factors (defined as those that reduce adolescent risky behavior) reduce the impetus on a parent to talk about related topics with her child, ignoring school effects would cause us to understate the true effect of parental talk. On the other hand, if parents choose schools because of the school's policies or peer groups, parents who desire to have their adolescents participate in discussions of risky behavior may choose schools with positive programs and peers, at the same time having their own discussions with the adolescent. Ignoring school choice would cause us to overstate the effect of parental talk. Controlling for school fixed effects has the added bonus of eliminating the need to identify what school policies or peer influences are, in fact, effective in reducing adolescent risky behavior while allowing that such factors still may have significant influence on the adolescent's outcomes.

We might be concerned that adolescent sexual behavior is affected by alcohol and substance use as well. There is some evidence that alcohol use by adolescents is positively

correlated with sexual behavior (Grossman, et. al. 2004), however few studies examine the causal nature of this relationship. Of those that do, findings support weak effects or no effect of substance use on sexual behavior. Rees et al. (2001) estimated bivariate probit models of sexual behavior (sexual initiation or use of birth control) and substance use (alcohol or marijuana) and found only weak evidence that significant alcohol use increased the probability that adolescent males had sexual intercourse without the use of contraception. Markowitz, et al. (2005), estimated a bivariate probit model that controls for individual fixed effects and also found no significant effect of alcohol consumption on the initiation of sexual intercourse. However, they found that alcohol consumption decreases the probability of condom use and birth control. In our research, in order to allow for correlation in the unobservables that influence adolescent risky behaviors, we estimate the following model:

$$(3) \qquad R_{1it}^{*} = \zeta R_{2it} + \alpha_1 PT_{1it} + \delta_1 PB_{it} + \Theta_1 PS_{1i} + \gamma_1' F_{it} + \beta_1' X_{it} + \varepsilon_{1it}$$

$$R_{2it}^{*} = \delta_2 PB_{it} + \Theta_2 PS_{2i} + \gamma_2' F_{it} + \beta_2' X_{it} + \varepsilon_{2it}$$

$$Cov(\varepsilon_{1it}, \varepsilon_{2it}) = \rho$$

where subscripts 1 and 2 denote sexual behavior and alcohol use respectively. The parameter $\rho$, if statistically significant, will reflect an interplay of these choices for adolescents that is explained by something unobserved to the econometrician. The estimate of $\zeta$ captures the direct effect of alcohol use on sexual activity. Where we differ from Rees, et al. (2001) and Markowitz, et al. is the inclusion of a fuller set of parenting inputs in our models. This allows for the possibility that parent's who do not abuse alcohol may have an indirect effect on their child's sexual behavior through the adolescence's delay of alcohol use, even in the absence of talk

regarding sexual initiation. The presence of a unique indicator of "talk" in the sexual activity equation provides identification in the model beyond the functional forms chosen. (That is, the specific parental inputs provide plausible exclusion restrictions.)

Digging further into the previously "black box" of parenting, parenting style may interact in important ways with the choice of parental talk so we allow for an interaction between these two variables as shown below:

$$(4) \qquad R_{it}^{*} = \alpha PT_{it} + \zeta PT_{it}PS_i + \delta PB_{it} + \Theta PS_i + \gamma' F_{it} + \beta' X_{it} + s_{it} + \varepsilon_{it}$$

If parental talk is more (less) effective at deterring risky behavior when a parent is stricter, the coefficient on the interaction of PS and PT will be significant and negative (positive).

Including interaction terms of talk and walk in a fifth model may indicate for which parents talk is most effective.

$$(5) \qquad R_{it}^{*} = + \alpha PT_{it}(1-PB_{it}) + \zeta PT_{it}PB_{it} + \delta(1-PT_{it})(1-PB_{it}) + \Theta PS_i + \gamma' F_{it} + \beta' X_{it} + s_{it} + \varepsilon_{it}$$

If a parent talk is more effective when the parent also did not demonstrate risky behaviors in her past, an estimate of $\alpha$ will be negative and statistically significant. If parent talk is more effective when coming from a parent who can share what she has learned through her own risky behavior, $\zeta$ will be negative and statistically significant. If nonrisky parent behavior can reduce the probability of ensuring nonrisky adolescent behavior even in the absence of talking with the child, $\delta$ will be negative and statistically significant. Furthermore, the magnitudes of the estimated coefficients will demonstrate the relative effectiveness of different combination of

walk and talk (where each of these is identified relative to the state in which the parent was a teenage mother and chose not to talk about sex with her adolescent.)

While our school fixed effects model (2) controls for unobserved school and peer effects, one potential remaining source of endogeneity in parental talk is unobserved characteristics of the individual child to which the parent adjusts her talk strategy. Using the presence of sibling pairs in AddHealth we can control for a portion of this by using sibling fixed effects, denoted below by $s_{ft}$, if there is a familial propensity for risky behaviors

$$(6) \qquad R_{fit}^{*} = \alpha PT_{fit} + \Theta PS + \gamma' F_{fit} + \beta' X_{fit} + s_{ft} + \varepsilon_{fit}$$

In this way, we can identify the effect of talk based on family observations where the parent chooses to talk to one child and not the other. However, we cannot observe the effect of parental walk, since this is constant across siblings within a family. An alternative model that more directly controls for adolescent-specific unobservables by utilizing the panel nature of the AddHealth data is an individual fixed effects model. However, such a model is not feasible for us because the parental walk and talk variables are only observed in wave 1 of the AddHealth. Yet, the sibling fixed effect model can tell us something about any remaining endogeneity in parental talk in model (2), however, they cannot estimate the effect of parental walk.

In each of the models described above, we include variables capturing family structure in the vector $F_{it}$. Existing research has documented the relationship between birth order and risky adolescent behavior. Children with older siblings are more likely to use alcohol and are more likely to be sexually active than observationally identical first-born children, even after controlling for family size and other background characteristics (Rodgers et. al 1992, Argys et al.

2006.) While the estimated vector $\gamma$ will indicate the direct effects of these family characteristics, it is also possible that these characteristics might interact with parental inputs to explain some of the variation in the probability of adolescent risky behavior. For example, Hao, et al. (2007) developed a theoretical model that illustrates the incentive parents face to behave in certain ways (e.g., punish) older siblings in order to signal younger siblings. Their results suggest an inverse relationship between birth order and severity of punishment. Averett, et al. (in press) found that first-born children are more closely supervised than later-born children. Both of these facts suggest an important relationship between birth order and parenting style. Further, if first-born children are not influenced by younger siblings in the same way that younger siblings are affected by their older siblings, or if parents (dis)taste for adolescent risky behavior or estimates of the true cost of adolescent risky behavior changes with experience rearing a first-born child, the underlying fundamentals of a parents utility function (which determines her choice of talk and parenting style) may be quite different for her first born than later-born children. In light of these complications due to birth order, we will run additional models similar to those described above focusing on first-born children only.

**Initial Results**

Table 3 presents results from basic regression models resembling Model 1 above. The table is split by gender of the adolescent, and each column represents a different univariate probit model with indicators of neither walk nor talk (Column A), walk alone (Column B), talk only (Column C), or both (Column D). Each regression includes a parsimonious set of regressors, namely demographics and indicators of family structure as covariates. We will expand our set of covariates in later work.

Overwhelmingly, the initial results in Table 3 reflect statistically significant relationships. Black and Hispanic adolescents are more likely than their white counterparts to engage in sexual intercourse, particularly for males. Adolescents who are in none of these categories (denoted "other race") are generally found to be less likely than whites to have sex. That this is no longer significant in the specification including parent talk (Column C) suggests that parent talk may be more or less effective depending on race or that observed parent talk reflects something different for different races, a question will explore further.

Older adolescents are more likely to engage in sexual intercourse. Relative to adolescents who live in a home with both biological parents, teens who live with only one biological parent, with neither parent, or in a two-parent home where only one parent is biological are more likely to have sex.

In these basic regressions, parent walk and talk are significant predictors of sexual intercourse for both male and females. Adolescents whose mothers had at least on child in her teenage years are more likely to engage in sex during their teen years. If the mother reports discussing sex with her child, the adolescent is more likely to engage in sex as well. Both of these relationships appear to be even stronger for female adolescents, suggesting greater parental influence over females, greater parental response to risky behavior by females, or both.

These initial results reflect correlations between a limited set of observable child and parent characteristics and adolescent sexual intercourse. Future analyses will include more detail on family structure (especially data on siblings), socioeconomic measures, and MCA-generated indexes of parenting style. Whereas our chief empirical focus and challenge is making causal interpretations, our future research will control for a variety of unobserved factors as well through the methods described above.

## Table 3: Probit Model of Adolescent Sexual Intercourse, by Gender

| | Males: Probability of Having had sexual intercourse | | | | Females: Probability of Having had sexual intercourse | | | |
|---|---|---|---|---|---|---|---|---|
| Black | 0.2284*** | 0.2274*** | 0.2382*** | 0.2365*** | 0.0852*** | 0.0846*** | 0.0915*** | 0.0904*** |
| | (0.0100) | (0.0100) | (0.0140) | (0.0140) | (0.0094) | (0.0094) | (0.0130) | (0.0130) |
| Hispanic | 0.1011*** | 0.1006*** | 0.0852*** | 0.0846*** | -0.0118 | -0.0132 | -0.0336** | -0.0361** |
| | (0.0110) | (0.0110) | (0.0158) | (0.0158) | (0.0110) | (0.0110) | (0.0154) | (0.0154) |
| Other Race | -0.0477*** | -0.0474*** | -0.0116 | -0.0117 | -0.0732*** | -0.0727*** | -0.0226 | -0.0222 |
| | (0.0108) | (0.0108) | (0.0161) | (0.0161) | (0.0110) | (0.0110) | (0.0160) | (0.0159) |
| Age, years | 0.0988*** | 0.0989*** | 0.0994*** | 0.0991*** | 0.1040*** | 0.1040*** | 0.1053*** | 0.1045*** |
| | (0.0023) | (0.0023) | (0.0031) | (0.0031) | (0.0022) | (0.0022) | (0.0030) | (0.0030) |
| Lives with one biological parent | 0.1372*** | 0.1348*** | 0.1265*** | 0.1228*** | 0.1316*** | 0.1280*** | 0.1305*** | 0.1240*** |
| | (0.0092) | (0.0092) | (0.0126) | (0.0127) | (0.0088) | (0.0088) | (0.0119) | (0.0120) |
| Does not live with either parent | 0.1529*** | 0.1533*** | 0.1322*** | 0.1330*** | 0.1916*** | 0.1906*** | 0.1612*** | 0.1591*** |
| | (0.0154) | (0.0153) | (0.0217) | (0.0217) | (0.0145) | (0.0145) | (0.0206) | (0.0206) |
| Lives in two parent family | 0.1136*** | 0.1094*** | 0.0947*** | 0.0870*** | 0.1363*** | 0.1313*** | 0.1334*** | 0.1223*** |
| but one parent not biological | (0.0123) | (0.0124) | (0.0177) | (0.0179) | (0.0125) | (0.0125) | (0.0179) | (0.0181) |
| Mother was a teen mother | | 0.0614*** | | 0.0504*** | | 0.0741*** | | 0.0729*** |
| | | (0.0181) | | (0.0188) | | (0.0171) | | (0.0175) |
| Mom talked to teen about sex | | | 0.0630*** | 0.0625*** | | | 0.0844*** | 0.0824*** |
| | | | (0.0108) | (0.0108) | | | (0.0110) | (0.0110) |
| Constant | -1.2784*** | -1.2815*** | -1.3118*** | -1.3094*** | -1.3273*** | -1.3284*** | -1.4049*** | -1.3951*** |
| | (0.0364) | (0.0364) | (0.0490) | (0.0490) | (0.0350) | (0.0350) | (0.0467) | (0.0468) |
| Observations | 13736 | 13736 | 6923 | 6923 | 14463 | 14463 | 7196 | 7196 |

Standard errors in parentheses

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

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