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**Early Predictors of Girls’
Adolescent Sexual
Activity: Longitudinal
Findings from the Girls
Shape the Future Study**

Final Report

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*Brian Goesling
Anu Rangarajan*

Submitted to:

Girls Incorporated
441 West Michigan St.
Indianapolis, IN 46202-3232

Project Officers:

Heather Johnston Nicholson
Kristin Adams

Submitted by:

Mathematica Policy Research, Inc.
P.O. Box 2393
Princeton, NJ 08543-2393
Telephone: (609) 799-3535
Facsimile: (609) 799-0005

Project Director:

Anu Rangarajan

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EXECUTIVE SUMMARY

High rates of risky sexual behaviors among U.S. adolescents have been a long-standing concern of social policy and research. Recent national estimates indicate that nearly half of all high school students have had sexual intercourse. Among those students who are sexually active, more than one-third have engaged in unprotected sex. The risks associated with unprotected sex include not only unintended pregnancy but also the spread of HIV and other sexually transmitted infections.

To add to the research evidence in this area, this report summarizes results from a secondary analysis of data from the Girls Shape the Future (GSTF) study, a unique new longitudinal survey of a relatively high-risk sample of adolescent girls. The study was conducted from 2001 to 2006 by Mathematica Policy Research, Inc. (MPR) in collaboration with Girls Incorporated[®] (Girls Inc.[®]), a nonprofit youth organization that provides education and support programs to girls ages 6 to 18 through a network of affiliate sites in the United States and Canada. More than 800 adolescent girls from five Girls Inc. affiliate sites participated in the study by completing three rounds of survey questionnaires over a three-year period from approximately sixth through ninth grades.

Drawing on this information, the report answers three broad questions concerning girls' early experiences with adolescent sexual activity: (1) How do girls' sexual risk behaviors change in early adolescence? (2) What factors put girls at risk for early involvement in sexual activity? (3) What factors put girls at risk for early involvement in unprotected sexual activity? Answers to these questions are important not only for expanding the research evidence on adolescent sexual activity, but also for improving programs designed to promote adolescent health through the prevention of risky sexual behaviors.

Research Methods

Our analysis is based on longitudinal data collected through three rounds of surveys: (1) a baseline survey administered shortly after girls were recruited into the study, (2) a first follow-up survey completed an average of 17 months after baseline, usually when the girls were in seventh grade, and (3) a ninth-grade survey completed an average of 40 months after baseline, usually during spring of the girls' ninth grade year.

We focus on two key self-reported measures of adolescent sexual activity—ever having had sexual intercourse and not using a condom during last intercourse. In examining the factors that put girls at risk for early involvement in sexual activity, we focus on five broad groups of factors that prior studies have identified as especially important determinants of adolescent sexual behavior: (1) demographic characteristics such as race/ethnicity and age, (2) teens' views and attitudes toward sex and taking risks, (3) substance use and negative peer influences, (4) school-related factors, and (5) family relationships.

We use slightly different analysis samples and analytic methods to answer each of the study's research questions. First, to examine how girls' sexual risk behaviors change in early

adolescence, we use basic descriptive methods to show how the percentage of girls who reported having engaged in different behaviors changed over the three-year study period. Second, to determine the factors that put girls at risk for early involvement in sexual intercourse, we use bivariate and multivariate logistic regression analyses to examine the association of various demographic and personal characteristics from the first follow-up survey with the chances of later initiating sexual intercourse between the first follow-up and ninth-grade surveys. Third, to determine the factors that put girls at risk for early involvement in risky sexual behaviors, we use basic descriptive methods to identify the distinctive characteristics of girls who reported having engaged in unprotected sex.

Key Findings

Consistent with the findings of prior research, we find that rates of sexual activity increase sharply in adolescence. From sixth to ninth grade, the percentage of girls in our sample who reported ever having had sexual intercourse jumped from 3 percent to nearly 30 percent. In addition, among those girls who were sexually active, the percentage who reported not using a condom the last time they had sex increased from 25 percent to 30 percent between seventh and ninth grades. These rates are very similar to those reported in national data sets for girls in this age group.

As rates of sexual activity increased, the girls in our sample also developed more accepting attitudes toward sex. For example, when asked whether it is okay for teenagers to have sex if they have been dating for a long time, the percentage of girls who agreed with this statement increased from 19 percent to 31 percent. The percentage of girls who felt it is okay for teens to have sex if they use birth control also increased.

We find that the strongest predictors of early involvement in sexual activity include (1) academic achievement and (2) attitudes toward sex. For academic achievement, girls who reported receiving high grades in their reading classes at the time of the first follow-up survey had a 17 percent chance of initiating sexual intercourse between the first follow-up and ninth-grade surveys, compared with a 46 percent chance for girls who reported receiving low grades in their reading classes. For attitudes toward sex, the chances of initiating sexual intercourse were more than twice as great for girls who expressed the most accepting attitudes than for those who were least accepting (42 percent versus 17 percent). These estimates are adjusted for differences between groups in demographic and other personal characteristics.

We also find evidence that the chances of initiating sexual intercourse are related to several other personal and family characteristics, including negative peer influences, substance use, and family relationships. In particular, girls in our sample were more likely to initiate sexual intercourse if they reported receiving pressure from their friends to have sex, having used drugs or alcohol, or having less positive relationships with their parents, especially their mothers. However, these associations are not as strong after adjusting for other demographic and personal characteristics, especially academic achievement and attitudes toward sex.

Finally, we find that a different set of factors is related to girls' involvement in unprotected sexual activity. Among the girls in our sample who were sexually active, those who reported involvement in unprotected sexual activity had higher rates of substance use, felt less attached to

school, and were less likely to participate in extracurricular activities. Participation in sports and church or religious groups in particular was lower among girls who engaged unprotected sex than among other sexually-active study girls. These findings are based on a relatively small sample of 93 girls and do not adjust for differences between groups in demographic or other personal characteristics.

Implications

Our findings have three main implications for programs aimed at reducing high rates of risky sexual behaviors among U.S. adolescents:

1. ***Promote academic achievement and healthy attitudes toward sex.*** Our findings for the early predictors of sexual intercourse suggest that programs for younger girls should consider academic achievement and general attitudes toward sex as two possible mechanisms for delaying the initiation of adolescent sexual activity. Both factors are strongly predictive of girls' later involvement in sexual activity and both may be amenable to change through intervention.
2. ***Address changes in attitudes as girls transition to high school.*** When discussing girls' attitudes toward sex, programs should focus especially on possible changes in attitudes occurring during the transition from middle school to high school. Our findings concerning trends in girls' attitudes show that although most girls disapprove of premarital and teenage sex as middle school students, they develop more accepting attitudes during the transition to high school. Successful programs must focus not only on encouraging healthy attitudes among middle school students but also on sustaining these attitudes as teens grow older and face new experiences and challenges as high school students.
3. ***Adapt program models as girls age.*** Our findings for the early predictors of unprotected sexual activity suggest that programs may need to change their focus as girls age and have their first experiences with sexual activity. In particular, to encourage safe and healthy behaviors among girls after they become sexually active, it may be less important to focus on their general attitudes toward sex than on issues such as substance use, attachment to school, and participation in extracurricular activities—the three factors most closely associated with unprotected sexual activity among the girls in our sample.

A. INTRODUCTION AND BACKGROUND

High rates of risky sexual behaviors among U.S. adolescents have been a long-standing concern of social policy and research. Recent national estimates indicate that nearly half of all high school students have had sexual intercourse (CDC 2008). The proportion of students who report having had sex declined in the 1990s, but has held steady since 2001. Among those students who are sexually active, more than one-third have engaged in unprotected sex (CDC 2008). The risks associated with unprotected sex include not only unintended pregnancy but also the spread of HIV and other sexually transmitted infections. Research by the Centers for Disease Control and Prevention (CDC) suggests that as many as one in four teenage girls has a sexually transmitted infection, including nearly half of all teenage African American girls (Forhan et al. 2008).

Motivated in part by the high prevalence of these risks and their possible negative consequences for adolescent health and well-being, many programs have been developed to reduce youth involvement in risky sexual behaviors. For example, nearly 90 percent of public school students take at least one sexuality education class before finishing high school (Kaiser Family Foundation 2002). Many teens also participate in additional after-school relationship skills and sexuality education programs, sponsored by a broad range of local community and national youth organizations (Karney et al. 2007; Kirby 2007). Funding for these programs comes from a mix of private and public sources, including federal support for family planning services and both HIV and abstinence education programs.

To add to the research evidence in this area, this report summarizes results from a secondary analysis of data from the Girls Shape the Future (GSTF) study, a unique new longitudinal survey of a relatively high-risk sample of adolescent girls. The study was conducted from 2001 to 2006 by Mathematica Policy Research, Inc. (MPR) in collaboration with Girls Incorporated®

(Girls Inc.[®]), a nonprofit youth organization that provides education and support programs to girls ages 6 to 18 through a network of affiliate sites in the United States and Canada. More than 800 adolescent girls from five Girls Inc. affiliate sites participated in the study by completing three rounds of survey questionnaires over a three-year period from approximately sixth through ninth grades. The surveys collected rich information on the girls' families, friends, attitudes, and early experiences with sexual behavior.

Drawing on this information, the report examines three broad research questions concerning the prevalence and determinants of girls' adolescent sexual activity:

- **How do girls' sexual risk behaviors change in early adolescence?** What proportion of girls have initiated sexual intercourse by ninth grade? What proportion have engaged in unprotected sex? Do girls develop more accepting attitudes toward sex in early adolescence?
- **What factors put girls at risk for early involvement in sexual activity?** How do the chances of initiating sexual intercourse relate to demographic characteristics such as age, race/ethnicity, and socioeconomic status? Are girls with more accepting attitudes toward sex and taking risks at greater risk for early involvement in sexual activity? How do substance use behaviors and negative peer influences relate to the chances of initiating sexual intercourse? Can school and family characteristics act as protective factors against early involvement in sexual activity?
- **What factors put girls at risk for early involvement in unprotected sexual activity?** What are the characteristics of girls who engage in unprotected sexual activity? Do they come from disadvantaged families or have poor relationships with their parents? Are they more likely to use drugs, tobacco, and alcohol than other girls in their age group? Do they feel less attached to school or have lower participation in extracurricular activities? Do their attitudes toward sex and taking risks differ from those of other girls in their age group?

Answers to these questions are important not only for expanding the research evidence on adolescent sexual activity, but also for improving programs designed to promote adolescent health through the prevention of risky sexual behaviors.

The report is divided into four remaining sections. First, we briefly review prior research evidence on the early predictors of adolescent sexual behavior. We focus specifically on

evidence concerning how rates of adolescent sexual activity vary according to various demographic and personal characteristics. Then, we describe the data and methods we used for our analyses. All of the analyses are based on data from the GSTF study, but the analysis sample, measures, and analytic methods vary depending on the research question. Next, we describe the results of our analysis, comparing our findings for the GSTF study with the results of prior research. We end the report by summarizing our research findings and discussing their implications for youth policy and research.

B. PRIOR RESEARCH ON ADOLESCENT SEXUAL ACTIVITY

Prior studies have identified many factors that put adolescents at risk for early involvement in sexual activity (Kirby 2007). In this study, we focus specifically on evidence concerning five broad groups of factors that prior studies have identified as especially important determinants of adolescent sexual activity: (1) demographic characteristics such as race/ethnicity and age, (2) teens' views and attitudes toward sex and taking risks, (3) substance use and negative peer influences, (4) school-related factors, and (5) family relationships.

1. Demographic Factors

Rates of adolescent sexual activity increase sharply with age. Some of the best evidence on age differences in adolescent sexual activity comes from the national Youth Risk Behavior Survey (YRBS), a nationally representative survey of high school students conducted every two years by the CDC. Data from the 2007 YRBS indicate that the percentage of high school students who report ever having had sexual intercourse jumps from 33 percent for ninth grade students to over 60 percent for twelfth grade students (CDC 2008). Only 7 percent of high school students report having had sexual intercourse before age 13. Over half (53 percent) of all twelfth

graders report having had sex in the past three months, compared with less than one-quarter (20 percent) of all ninth grade students (CDC 2008).

Rates of risky adolescent sexual behaviors also increase with age. For example, data from the 2007 YRBS indicate that the percentage of high school students who report having had sex with at least four different partners in their lifetime increases from less than 10 percent for ninth grade students to over 20 percent for twelfth grade students (CDC 2008). Similarly, among students who report having had sex in the past three months, the percentage who say they did *not* use a condom the last time they had sex jumps from 31 percent for ninth grade students to 46 percent for twelfth graders (CDC 2008). These rates are similar to those reported in other national data sets for teens in this age group (Abma et al. 2004). The increase in the percentage of students who report not using a condom the last time they had sex may be explained in part by older teens switching to other types of contraceptives. For example, data from the 2007 YRBS indicate that, among high school girls who are sexually active, the percentage who report using birth control pills increases from less than 10 percent for ninth grade students to nearly 26 percent for twelfth grade students (CDC 2008). Birth control pills protect against the risk of unintended pregnancy but not the spread of sexually transmitted infections.

In addition to these age group differences, studies have also found that the risk for early involvement in sexual activity varies by demographic characteristics such as race/ethnicity and gender. Data from the 2002 National Survey of Family Growth (NSFG) show that the percentage of teens who report ever having had sex is higher for boys than for girls among both African Americans and Hispanics (Abma et al. 2004). For teenage whites, however, girls are just as likely as boys to report having ever had sex (Abma et al. 2004; CDC 2008). Regardless of racial or ethnic background, teenage boys are more likely than girls to report having engaged in risky

sexual behaviors, including having had sex with at least four different partners and having used drugs or alcohol before the last time they had sex (CDC 2008).

2. Attitudes Toward Sex and Taking Risks

Rates of adolescent sexual activity are strongly related to teens' views and attitudes toward sex. Drawing on longitudinal data for a diverse sample of more than 800 public high school students, Carvajal et al. (1999) found that teens with accepting attitudes toward sex were significantly more likely than other teens to initiate sexual intercourse over a two-year study period. The study measured teens' attitudes toward sex by asking students whether they believe it is okay for people their age to have sex with a steady boyfriend or girlfriend, or whether they agree that people their age should wait to have sex until they are older. Similarly, focusing on data for a slightly younger sample of teens, a more recent study by Blinn-Pike et al. (2004) found that boys and girls who initiate sexual intercourse in early adolescence are more likely than abstinent teens to approve of sex among unmarried teenagers. In his recent review article on the determinants of adolescent sexual activity, Kirby (2007) notes that changing teens' attitudes toward sex may be one of the most effective ways to reduce youth involvement in risky sexual behaviors and help prevent teenage pregnancy, because studies have consistently found a strong link between teens' attitudes toward sex and their later sexual behaviors, and because attitudes can ostensibly be changed through intervention, unlike other predictors of adolescent sexual behaviors such as race/ethnicity or gender.

3. Substance Use and Negative Peer Influences

Adolescent sexual activity tends to cluster with other youth risk behaviors, especially the use of alcohol, marijuana, tobacco, and other harmful substances. For example, data from the National Longitudinal Survey of Youth (NLSY) show that, for both girls and boys, teens who

use substances in early adolescence face an increased risk of initiating sexual intercourse before age 16 (Rosenbaum 1990). Other studies using more recent data have found similar results (Santelli et al. 2004; Tapert et al. 2001). In the NLSY, the correlation between substance use and adolescent sexual activity is stronger for Hispanics and whites than for African Americans (Rosenbaum 1990).

Studies also suggest that, regardless of their own substance use, teens face a greater risk of early involvement in sexual activity if their friends are substance users. For example, drawing on longitudinal data for a sample of nearly 1,400 middle school students, Kinsman et al. (1998) found that teens who report that their peers use alcohol are more likely than other teens to initiate sexual intercourse, controlling for their own level of alcohol use. This finding is consistent with evidence showing that peer influences can play an important role in determining youth involvement in sexual activity (Bearman and Bruckner 1999).

4. School-Related Factors

There is less evidence concerning the influence of school environment on adolescent sexual activity. Several studies have found that teens who get good grades in school or high scores on academic achievement tests are less likely than other teens to initiate sexual intercourse, controlling for family background and other personal characteristics. For example, data from the National Longitudinal Study of Adolescent Health (Add Health) show that for every one-point gain in student grade point average, the chances of initiating sexual intercourse decline by 20 percent (Resnick et al. 1997; see also Halpern et al. 2000). Studies also show that the risk for early involvement in sexual activity is lower for teens who feel more attached to school (L'Engle and Jackson 2008; Resnick et al. 1997).

However, studies report mixed evidence concerning the effects on sexual activity of participation in extracurricular school activities. Analyzing data from the Add Health study,

Bearman and Bruckner (2001) found that participation in school sports activities reduces the chances of initiating sexual intercourse for teenage girls but not for teenage boys. In addition, the protective effects of sports participation may be somewhat weaker for African American girls than for Hispanic, Asian, and white girls (Bearman and Bruckner 2001). An earlier study by Halpern et al. (2000), also based on the Add Health data, found stronger effects on sexual activity for participation in school clubs than in school sports activities.

5. Family Influences

Evidence suggests that families can also have important protective influences on adolescent sexual behaviors. Many studies of family influences have focused on how rates of sexual activity vary across different family types, showing that the chances of initiating sexual intercourse are lower for teens who grow up living with both of their biological parents than for those raised by single parents (Kirby 2007). However, mounting evidence indicates that, beyond these effects of basic family structure, the quality of teens' relationships with their parents may also influence their sexual behaviors (Miller et al. 2001; Moore et al. 2004). In particular, studies show that teens who enjoy close, positive relationships with their parents are less likely to initiate sexual activity than teens who have more distant or negative relationships with parents (Dittus and Jaccard 2000; Jaccard et al. 1996). For teenage girls, the quality of their relationships with their mothers may be an especially important determinant of their sexual behaviors (Davis and Friel 2001; McNeely et al. 2002).

C. DATA, METHODS, AND MEASURES

To add to these research findings, this report presents results from a secondary analysis of data from the Girls Shape the Future (GSTF) study, a recent longitudinal survey that tracked a relatively high-risk sample of adolescent girls over a three-year period from approximately sixth

through ninth grades. The study coincided with a period when many of the girls had their first involvement with sexual activity. The study also adds to prior research by looking simultaneously at a wide array of factors that put girls at risk for early involvement in sexual activity, and by using a longitudinal research design to help establish the direction of the relationship between adolescent sexual activity and various demographic and personal characteristics. In this section, we begin by describing the GSTF study and the characteristics of the girls who were recruited to participate. Then, we describe the measures and analytic methods we used in our analysis.

1. Data and Samples

The GSTF study was designed to evaluate the implementation and effectiveness of the Girls Inc. Will Power/Won't Power[®] curriculum, a program to reduce risky adolescent sexual behaviors, pregnancy, and sexually transmitted infections by building skills and knowledge among girls ages 12 to 14 (Zief et al. 2008). The study design called for a random assignment evaluation to assess the effectiveness of the curriculum on key program outcomes, based on follow-up surveys collected one year after random assignment and again during the ninth and eleventh grades. A total of 832 girls were recruited to participate in the study from five Girls Inc. affiliate sites in different areas of the United States. Recruitment was conducted on a rolling basis beginning in 2001. After recruitment, girls were randomly assigned to either a program group that was eligible to participate in the Girls Inc. Will Power/Won't Power program or to a control group that was not offered the program.

Ultimately, the effectiveness of the program could not be estimated because the full curriculum was not delivered in some sites and, overall, less than two-thirds of the girls randomly assigned to the program group received any component of the curriculum. As a result, a decision was made to close out the impact analysis and end data collection efforts before fully

completing the ninth- and eleventh-grade surveys. However, the data collected earlier in the study provide a rich source of information on changes in adolescent girls' attitudes and risk behaviors during the middle school and early high school years. For a complete description of the study, see Zief et al. (2008).

For this analysis, we used data from three sources: (1) a baseline survey completed by 757 (91 percent) of the girls in the study shortly after recruitment; (2) the first follow-up survey, completed by 699 (84 percent) of the study girls an average of 17 months after baseline; and (3) the ninth-grade survey, completed by 494 (59 percent) of study girls an average of 40 months after baseline. The response rate was lower for the ninth-grade survey than for the two earlier surveys because the data collection efforts were stopped during the ninth-grade survey. Sampling weights were calculated for both the first follow-up and ninth-grade surveys to adjust for survey non-response and the incomplete release of girls for the ninth-grade survey.

Table 1 describes the baseline characteristics of the study sample. The girls ranged in age from 11 to 13 at the time of the baseline survey and more than three-quarters (82 percent) were sixth graders. The racial/ethnic composition of the sample was typical of the girls and young women served by Girls Inc. programming, with relatively high proportions of African Americans (41 percent) and Hispanics (26 percent). Nearly two-thirds (63 percent) of the baseline sample reported receiving free or reduced-price school lunch.

We used a slightly different analysis sample depending on the research question. To examine how girls' sexual risk behaviors change in adolescence, we used the sample of 397 girls who completed all three rounds of surveys. For other analyses, we focused on girls with data for both the first follow-up and ninth-grade surveys. We describe these analysis samples in greater detail below.

TABLE 1
CHARACTERISTICS OF BASELINE SAMPLE

Characteristics	Number	Percentage
Age		
11	393	52
12	253	33
13	111	15
Grade		
6th	617	82
7th	94	12
8th or 9th	46	6
Race/Ethnicity		
White	143	19
African American	310	41
Hispanic	195	26
Other	97	13
Missing	12	2
Receives Free/Reduced Price Lunch		
Yes	481	63
No	218	29
Missing	58	8
Sample Size	757	100

Source: Girls Shape the Future study conducted by Mathematica Policy Research, Inc.

2. Measures

We focused on two common measures of involvement with sexual activity (Table 2). First, girls were asked in all three surveys whether they have ever had sexual intercourse. We used this measure to compare girls who reported ever having had sexual intercourse with those who reported never having had sex. Second, in both the first follow-up and ninth-grade surveys, girls were asked whether their partner used a condom the last time they had sex. We used this measure as an indicator of involvement in risky sexual behaviors. Information on unprotected sexual activity was not collected in the baseline survey, due to the young age range of the baseline sample.

TABLE 2
VARIABLES USED IN ANALYSIS

Variable	Definition
Sexual Activity	
Sexual Intercourse	Binary variable: equals 1 if girl reported ever having had sexual intercourse; equals 0 if girl reported never having had sex.
Unprotected Sexual Activity	Binary variable: equals 1 if girl reported that her partner did not use a condom during last sex; equals 0 if girl reported that her partner did use a condom.
Demographic Characteristics	
Age	Categorical variable, with three categories for age at time of ninth-grade survey: (1) 14 years old, (2) 15 years old, (3) 16+ years old.
Race/ethnicity	Categorical variable, with four categories: (1) white, (2) African American, (3) Hispanic, (4) other.
Free/Reduce Price Lunch	Binary variable: equals 1 if girl reported receiving free or reduced price school lunch; equals 0 otherwise
Views Toward Sex and Taking Risks	
Views Accepting of Premarital Sex	Continuous (scale) variable, reflecting average of responses to two survey questions (see Appendix A for list). Variable ranges from 0-3, with higher values indicating more supportive attitudes. Alpha coefficient for first follow-up survey equals .84.
Views Accepting of Teenage Sex	Continuous (scale) variable, reflecting average of responses to five survey questions (see Appendix A for list). Variable ranges from 0-3, with higher values indicating more supportive attitudes. Alpha coefficient for first follow-up survey equals .75.
Views Supportive of Taking Risks	Continuous (scale) variable, reflecting average of responses to five survey questions (see Appendix A for list). Variable ranges from 0-3, with higher values indicating more supportive attitudes. Alpha coefficient for first follow-up survey equals .44.
Substance Use and Negative Peer Influences	
Any Substance Use in Past Month	Binary variable: equals 1 if girl reported any use of alcohol, tobacco, or marijuana in past month; equals 0 if girl reported no substance use.
Any Peer Substance Use in Past Month	Binary variable: equals 1 if girl reported that friends used alcohol, tobacco, or marijuana in past month; equals 0 if girl reported no peer substance use.
Receives Pressure from Friends to Have Sex	Binary variable: equals 1 if girl reported receiving pressure from friends to have sex; equals 0 if girl did not report receiving pressure.

TABLE 2 (continued)

Variable	Definition
School-Related Factors	
Grade in Last Reading Class	Categorical variable, with three categories for self-reported grade in last reading class: (1) A or 90 to 100, (2) B or 80 to 90, (3) C, D, F or below 80.
Attachment to School	Continuous (scale) variable, reflecting average of responses to five survey questions (see Appendix A for list). Variable ranges from 0-3, with higher values indicating greater attachment to school. Alpha coefficient for first follow-up survey equals .57.
Participation in Extracurricular Activities	Continuous (scale) variable, reflecting total number of activities in which girls participated during the past year (see Appendix A for list of activities.) Ranges from 0 to 13.
Family Relationships	
Lives with Mother	Binary variable: equals 1 if girl reported living with mother or mother figure; equals 0 if girl reported not living with her.
Lives with Father	Binary variable: equals 1 if girl reported living with father or father figure; equals 0 if girl reported not living with him.
Relationship Quality with Mother	Continuous (scale) variable, reflecting average of responses to four survey questions (see Appendix A for list). Variable ranges from 0-3, with higher values indicating more positive relationship. Alpha coefficient for first follow-up survey equals .81.
Relationship Quality with Father	Continuous (scale) variable, reflecting average of responses to four survey questions (see Appendix A for list). Variable ranges from 0-3, with higher values indicating more positive relationship. Alpha coefficient for first follow-up survey equals .82.

Source: Girls Shape the Future study conducted by Mathematica Policy Research, Inc.

The surveys also included several other measures of risky sexual behaviors, including number of sexual partners, substance use before last intercourse, and number of pregnancies. However, because the study sample was relatively young, fewer than 30 girls in the sample reported having had more than two sexual partners, using drugs or alcohol before the last time they had sex, or having ever been pregnant. This sample was too small to conduct detailed analyses of these measures.

In examining the early predictors of girls' sexual activity, we focused on the same five broad groups of variables discussed earlier in the literature review (Table 2):

- **Demographic characteristics.** To determine how rates of sexual activity differ according to the girls' demographic characteristics, we included measures of age, race/ethnicity, and socioeconomic status. Socioeconomic status was measured by asking girls whether they received free or reduced-price school lunch. Students are eligible for free or reduced-price school lunch if their family incomes are below 185 percent of the federal poverty level.
- **Attitudes toward sex and taking risks.** We measured girls' attitudes toward sex and taking risks with three attitude scales that measure (1) views accepting of premarital sex, (2) views accepting of sex among teens, and (3) views supportive of taking risks. Each scale is an average of girls' responses to multiple survey questions. Values on the scales range from 0 to 3, with higher values indicating more accepting attitudes toward sex and taking risks. A detailed description of the items included in each scale is presented in Appendix A.
- **Substance use and negative peer influences.** Girls were asked in the first follow-up survey whether they had used any alcohol, tobacco, or marijuana in the month before the survey. For this analysis, we compared girls who reported using any substance in the past month with those who reported no substance use. From the first follow-up survey, we also included measures of peer substance use and whether girls reported feeling pressure from their friends to have sex.
- **School-related factors.** We included three measures of school environment, all taken from the first follow-up survey. First, girls were asked to report the grade they received in their last reading classes, which we used as a measure of academic achievement. Second, to measure girls' level of attachment to school, we combined five questions from the first follow-up survey into a four-point scale score ranging from 0 to 3, with higher values indicating greater attachment. The types of questions included in this scale asked girls whether they found it easy to make friends at school, enjoyed their classes, and felt safe at school (see Appendix A for a list). Third, we measured girls' level of participation in extracurricular activities by counting the total number of activities in which they participated during the past year. The three most common activities were (1) sports; (2) musical groups such as band, orchestra, or choir; and (3) church or religious groups. Appendix A presents a full list of activities.
- **Family relationships.** We used two types of measures of family relationships. First, to measure basic family structure, girls were asked whether they were living with either one or both of their parents at the time of the first follow-up survey. Second, we also measured the quality of girls' relationships with their parents, using two four-point attitude scales calculated from the first follow-up survey (see Appendix A for a list). One scale assesses the quality of girls' relationships with their mothers or mother figures, the other the quality of girls' relationships with their fathers or father figures.

figures. Both scales range from 0 to 3, with higher values indicating more positive relationships.

3. Methods

We used a different set of analytic methods to answer each of the study's three broad research questions. First, to examine how girls' sexual risk behaviors change in early adolescence, we used basic descriptive methods to calculate the percentage of girls who reported having engaged in sexual intercourse on each of the three surveys. We also calculated the percentage of girls who reported having engaged in unprotected sex, for the subgroup of girls who reported ever having had sex.

Second, to determine the factors that put girls at risk for early involvement in sexual activity, we used bivariate and multivariate logistic regression analyses to examine how various demographic and personal characteristics from the first follow-up survey predict the chances of later initiating sexual intercourse between the first follow-up and ninth-grade surveys. We used this type of longitudinal design to help establish the direction of the relationship between sexual activity and the various predictor variables. For example, if we had instead measured both sexual activity and the various other characteristics with cross-sectional data from a single survey, we could not be sure whether the outcome behaviors occurred before or after the predictor variables.

Third, to determine the factors that put girls at risk for early involvement in risky sexual behaviors, we used basic descriptive methods to identify the distinctive characteristics of girls who reported having engaged in unprotected sex. We did not conduct multivariate analyses of the determinants of unprotected sexual activity, due to the relatively small number of girls who reported having engaged in unprotected sex. We describe this analysis in greater detail below.

D. HOW DO GIRLS' SEXUAL RISK BEHAVIORS CHANGE IN ADOLESCENCE?

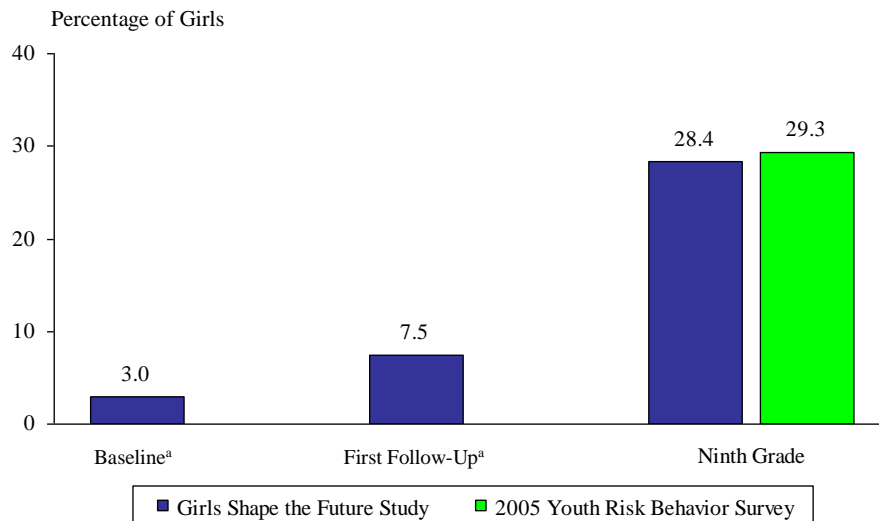
To examine how rates of sexual activity changed among girls in the GSTF study, we analyzed data for the sample of 397 study girls who completed all three rounds of surveys.¹ This sample is slightly younger than the full sample of 757 girls who completed the baseline survey but is similar in terms of both racial/ethnic and socioeconomic background. We used a consistent sample of girls across all three surveys to ensure that any changes we observed did not reflect differences in the sample of girls who responded to each survey. In this section, we describe how the chances of initiating sexual intercourse changed from the baseline survey to the ninth-grade survey. Then, we describe changes in the proportion of girls who reported having engaged in unprotected sex. We also describe changes in girls' views and attitudes toward sex.

- ***More than one-quarter of study girls had initiated sexual intercourse by the ninth-grade survey, a rate similar to the national average for girls in this age group.***

Rates of sexual activity increased sharply over the three-year study period (Figure 1). At baseline, only 3 percent of study girls reported ever having had sexual intercourse. By ninth grade, however, more than one-quarter of the girls in our sample (28 percent) reported having had sex. These rates are very similar to those reported in national surveys for girls in this age group. For example, data from the 2005 YRBS indicate that just over 29 percent of ninth grade girls nationwide reported having had sexual intercourse (CDC 2006). About 5 percent of ninth grade girls in the YRBS indicated that they had sex for the first time before age 13, a rate that is comparable to the 3 percent of girls who reported having had sexual intercourse in the baseline

¹ This sample excludes a subsample of 56 girls who were old enough at the time of the first follow-up survey to complete the ninth-grade survey at the same time. For these girls, field staff administered a single follow-up survey that included questions from both the first follow-up and ninth-grade surveys. We excluded these girls from any analyses that required separate responses to the first follow-up and ninth-grade surveys.

FIGURE 1
PERCENTAGE OF GIRLS WHO HAVE EVER HAD SEXUAL INTERCOURSE,
BY SURVEY YEAR AND DATA SOURCE



Source: Girls Shape the Future study conducted by Mathematica Policy Research, Inc.

^aComparable data are not available for the Youth Risk Behavior Survey.

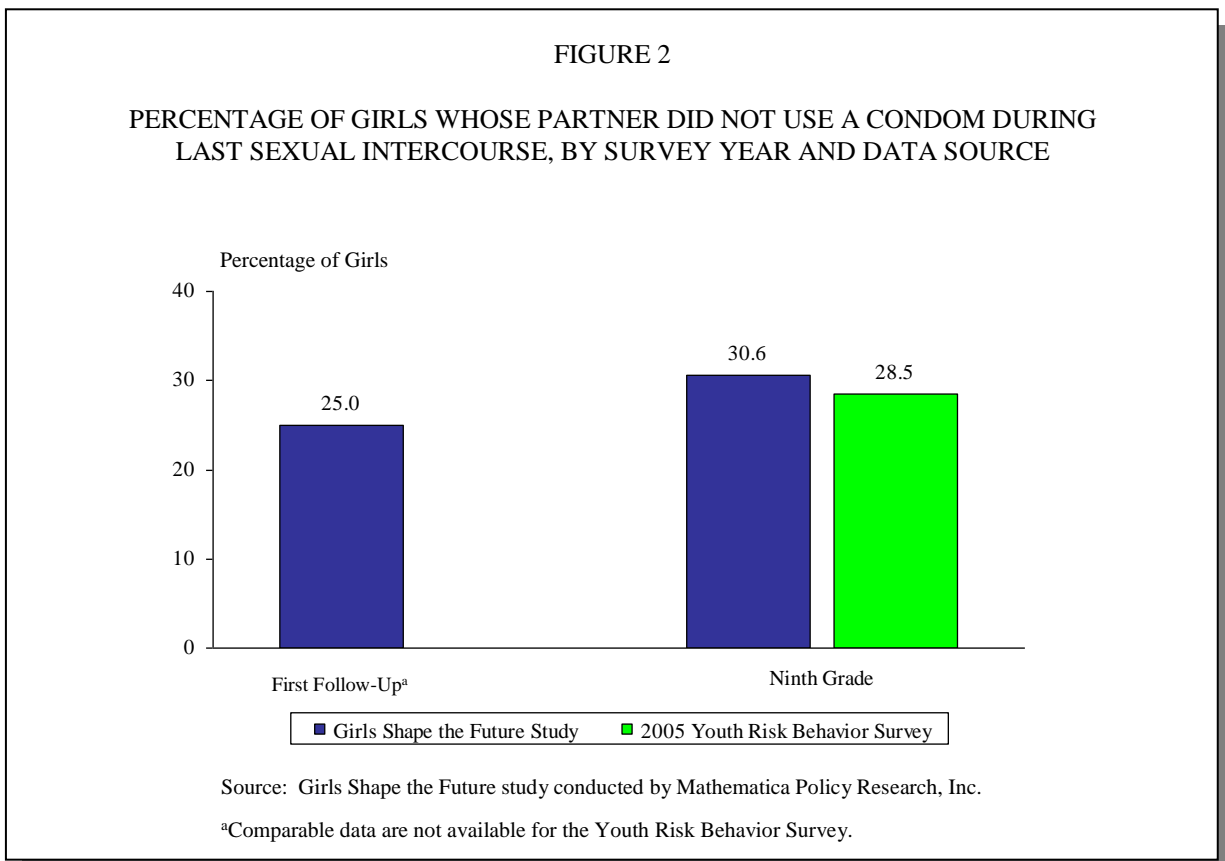
survey of the GSTF study. The 2005 YRBS was conducted around the same time as the ninth-grade GSTF survey.

Girls in the GSTF study were also asked to describe their feelings concerning their sexual experiences. Among the girls who had initiated sexual intercourse before the ninth-grade survey, girls were split evenly between those who said they regretted their experiences and those who expressed no regret (not shown). By contrast, among the girls who reported never having had sex, a large majority of girls (95 percent) said they felt fine with their experiences while only a small proportion (5 percent) said they regretted their experiences and wished they had had sex. These findings suggest that girls’ feelings toward their sexual experiences are more varied among girls who have initiated sexual intercourse than among girls who are abstinent.

- ***By ninth grade, nearly one-third of the girls who were sexually active had engaged in unprotected sex, a rate similar to the national average for girls in this age group.***

Among the girls in our sample who reported ever having had sexual intercourse, the proportion who reported that their partner did not use a condom the last time they had sex increased from 25 percent in the first follow-up survey to just over 30 percent in the ninth-grade survey (Figure 2). These rates are similar to those reported in national data sets for girls in this age group. For example, the comparable rate for ninth grade girls in the 2005 YRBS was nearly 29 percent (CDC 2006).

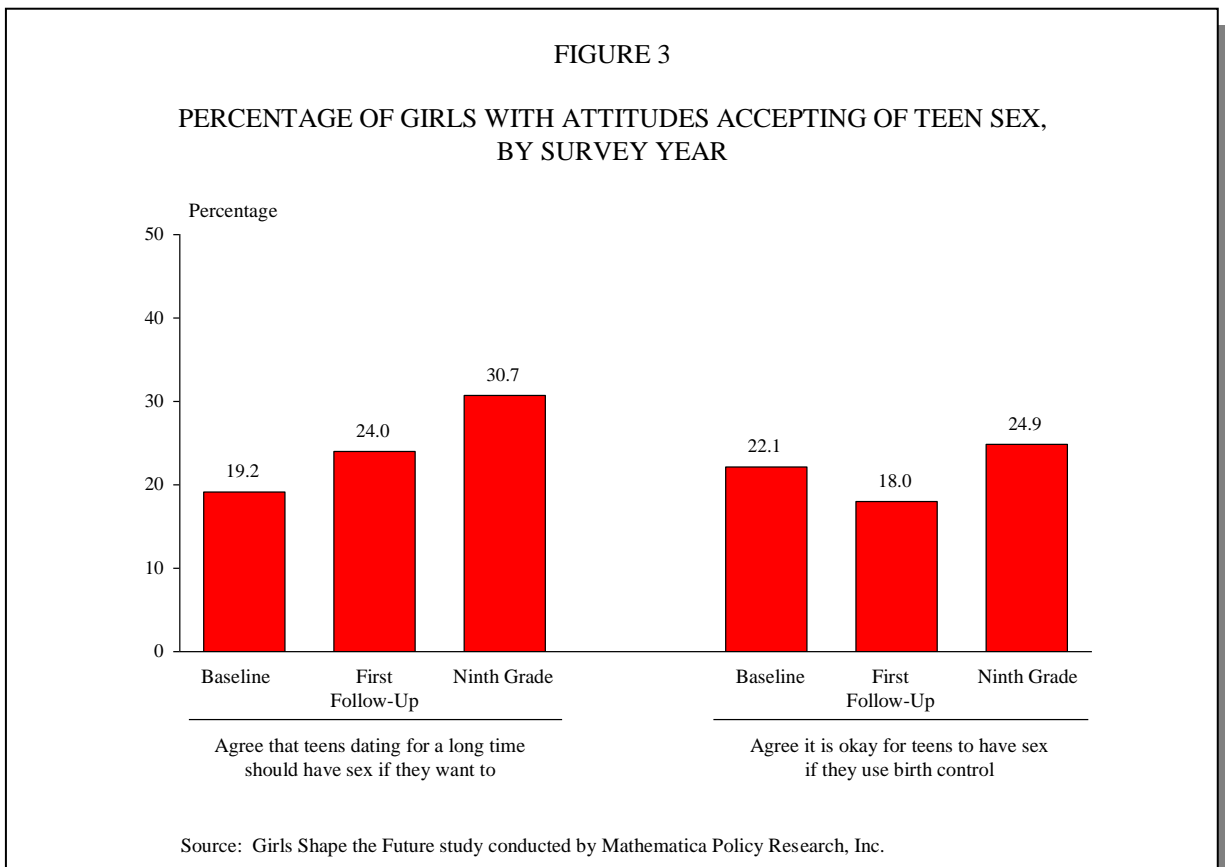
The increase in rates of unprotected sexual activity between the first follow-up and ninth-grade surveys is consistent with evidence from other sources (CDC 2008). However, because these statistics are conditional on ever having had sexual intercourse, the increase in rates could reflect compositional change in the sample of girls who reported having sex, instead of change in the likelihood of engaging in risky sexual behaviors. We could not separate these effects in the



GSTF study due to the relatively small sample of girls who reported having had sexual intercourse in both the first follow-up and ninth-grade surveys.

- ***Girls became more accepting of teenage sex during the three-year study period.***

The increase in rates of sexual activity among study girls follows a similar change in girls’ attitudes toward sex. For example, girls were asked in all three surveys whether they agreed or disagreed with the statement, “Teens who have been dating for a long time or going steady should have sex if they want to.” The percentage of girls who agreed with this statement increased from 19 percent in the baseline survey to over 30 percent in the ninth-grade survey (Figure 3), indicating a growing acceptance of sexual activity in the context of romantic relationships. Similarly, the percentage of girls who agreed that it is okay for teens to have sex if they use birth control increased from 22 percent in the baseline survey to nearly 25 percent in the ninth-grade survey.



At the same time, there was no change in girls' attitudes toward teenage pregnancy or childbearing. When asked whether it is okay to be pregnant as a teen or for teens to have babies, less than 10 percent of the girls in our sample expressed support—a rate that held steady over the three-year study period (not shown). This suggests that study girls became more accepting of sex in the context of romantic relationships without changing their attitudes toward the possible consequences of sexual activity for pregnancy and childbearing.

E. WHAT FACTORS PUT GIRLS AT RISK FOR EARLY INVOLVEMENT IN SEXUAL ACTIVITY?

What accounts for the increase in rates of sexual activity among the girls in our sample? To help answer that question, in this section we examine the factors that put girls at risk for early involvement in sexual activity. For this part of the analysis, we examined data for a sample of 353 girls who completed both the first follow-up and ninth-grade surveys. We focused on these surveys because rates of sexual activity before the first follow-up survey were relatively low (Figure 1, above). To identify the characteristics related to the initiation of sexual intercourse, we limited the sample to girls who reported never having had sex before the first follow-up survey. Of the 353 girls in our analysis sample, 26 percent (N = 93) reported having sex for the first time between the first follow-up and ninth-grade surveys.

First, we used basic descriptive methods to examine the association of various demographic and personal characteristics from the first follow-up survey with the chances of later initiating sexual intercourse between the first follow-up and ninth-grade surveys. Then, we estimated a multivariate logistic regression model to determine which of these characteristics are the strongest predictors of girls' sexual activity. The longitudinal design of these analyses ensures that all predictor variables were measured before the initiation of sexual activity, helping to establish the direction of the relationships.

- *The chances of initiating sexual intercourse increase with age but are similar regardless of girls' socioeconomic or racial/ethnic backgrounds.*

As we described earlier in the report, previous studies have found that rates of adolescent sexual activity vary by demographic characteristics such as age, race/ethnicity, and socioeconomic status. Data from the GSTF study confirm the finding that the chances of having sex increase sharply with age (Table 3). However, we found no significant differences in risk for early involvement in sexual activity by race/ethnicity or socioeconomic status. The chances of initiating sexual intercourse between the first follow-up and ninth-grade surveys were higher for African American girls (29 percent) than for whites (28 percent) and Hispanics (24 percent). However, these differences are not statistically significant. Similarly, the chances of initiating

TABLE 3
PROBABILITY OF INITIATING SEXUAL INTERCOURSE,
BY DEMOGRAPHIC CHARACTERISTICS

Demographic Characteristics	Probability (Percentage)	p-value	Sample Size
Age			
14 years ^a	18.0	--	340
15 years	28.9	.07*	
16 years or older	27.9	.18	
Racial/Ethnic Background			
White ^a	27.9	--	353
African American	29.3	.85	
Hispanic	23.7	.61	
Other	25.2	.77	
Receives Free or Reduced Price School Lunch			
No ^a	25.6	--	331
Yes	28.1	.65	

Source: Girls Shape the Future study conducted by Mathematica Policy Research, Inc.

^aReference category.

*/**/**Statistically different from reference category at 10/5/1 percent significance level.

intercourse were higher for girls who reported receiving free or reduced-price school lunch (28 percent) than for other study girls (26 percent), but the gap is not statistically significant.²

One possible explanation for these discrepant results is that, compared with the girls represented in national data sets, the girls in the GTSF study are a more homogeneous group that shares similar interests and family backgrounds. For example, because the sample for this study was drawn from five Girls Inc. affiliate sites, rather than from a nationally representative sample of girls, many of the girls are from the same communities and share common family backgrounds. In addition, as we described earlier in the report, over 60 percent of the girls in the baseline sample reported receiving free or reduced-price school lunch, indicating that many of the girls also share the common experience of growing up in a low-income family. These similarities among study girls may outweigh the differences in sexual activity by demographic characteristics typically found in national data sets.

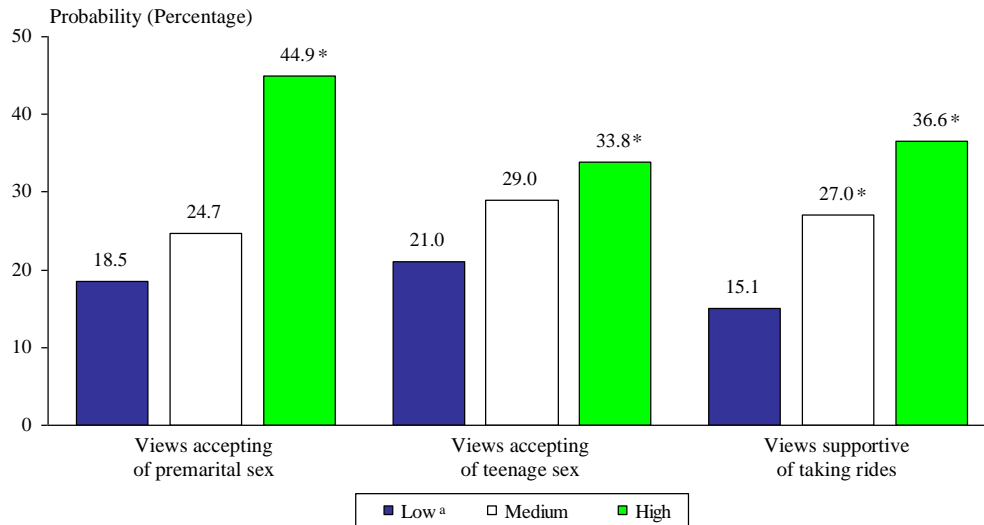
- ***Girls with accepting attitudes toward sex and taking risks were more likely than other study girls to initiate sexual intercourse.***

In contrast to the similar rates of sexual activity across racial/ethnic and socioeconomic groups, there are large differences in rates according to girls' attitudes toward sex and taking risks. Figure 4 shows how the chances of initiating sexual intercourse between the first follow-up and ninth-grade surveys relate to three attitude scales that measure (1) views accepting of premarital sex, (2) views accepting of teenage sex, and (3) views supportive of taking risks. For each scale, we compare the chances of initiating intercourse for girls in the bottom third of the scale with those in the middle and top thirds of the scale. Higher values indicate more accepting attitudes toward sex and taking risks.

² We tested the statistical significance of our findings using a 10 percent significance level due to the relatively small size of our sample. However, some of our findings are also statistically significant at the 5 or 1 percent significance levels, as noted in the tables and figures shown later in the report.

FIGURE 4

PROBABILITY OF INITIATING SEXUAL INTERCOURSE,
BY GIRLS' ATTITUDES TOWARD SEX AND TAKING RISKS



Source: Girls Shape the Future study conducted by Mathematica Policy Research, Inc.

Note: Higher values on attitude scales indicate more accepting attitudes.

^aReference group.

*/**/**Statistically different from reference category at 10/5/1 percent significance level.

For views accepting of premarital sex, the chances of initiating sexual intercourse were more than twice as great for girls with the most accepting attitudes (45 percent) than for those with the least accepting attitudes (19 percent). Similarly, for views accepting of teenage sex, the chances of initiating intercourse ranged from 34 percent for girls with the most accepting attitudes to 21 percent for those with the least accepting attitudes. Rates of sexual activity also differed according to girls' attitudes toward taking risks, with the chances of initiating intercourse more than twice as great for girls with the most accepting attitudes (37 percent) than for those with the least accepting attitudes (15 percent). All of these differences are statistically significant at the 10 percent level.

These findings are consistent with prior research evidence suggesting that adolescents' views and attitudes toward sex are among the strongest predictors of their later sexual behaviors

(Kirby 2007). However, a correlation between teens' sexual attitudes and behaviors does not necessarily imply a direct causal link between these factors, since both attitudes and behaviors may be related to other youth characteristics, such as family background or peer group environment. We address this issue in part by using longitudinal data to ensure that girls' attitudes toward sex are measured at a point before they initiated sexual activity. However, it is also important to statistically control for other demographic and personal characteristics when assessing the causal relationship between teens' attitudes and behaviors, as we illustrate later in the report.

- ***The chances of initiating sexual intercourse were higher for girls who used drugs or alcohol, had friends who used substances, or received pressure from friends to have sex.***

In line with the findings of prior research, data from the GSTF study show that involvement in adolescent sexual activity tends to cluster with participation in other types of risky adolescent behaviors. In particular, there is a strong correlation between sexual activity and prior substance use, such that girls who reported having used any substances (alcohol, tobacco, or marijuana) in the month before the first follow-up survey were more than twice as likely as other girls to initiate sexual intercourse between the first follow-up and ninth-grade surveys (50 percent versus 24 percent; Table 4). Similarly, girls' sexual activity is also correlated with substance use by their peers. Girls who reported that their friends used substances had a nearly 40 percent chance of initiating sexual intercourse, compared with 20 percent for girls who reported no peer substance use. This correlation between peer substance use and sexual behavior persists after adjusting for the girl's own substance use (not shown).

To measure another aspect of negative peer influences, girls were asked in the first follow-up survey whether they felt pressure from their friends to have sex. Consistent with the view that risky adolescent behaviors tend to go together, results show that the chances of initiating sexual

TABLE 4
PROBABILITY OF INITIATING SEXUAL INTERCOURSE, BY SUBSTANCE USE
AND NEGATIVE PEER INFLUENCES

Substance Use and Peer Indicators	Probability (Percentage)	p-value	Sample Size
Any Substance Use in Past Month			
Yes	50.0	<.01***	352
No ^a	23.8	--	
Any Peer Substance Use in Past Month			
Yes	39.5	<.01***	363
No ^a	20.3	--	
Don't know	23.2	.62	
Friends Give Pressure to Have Sex			
Yes	45.1	<.01***	353
No ^a	23.6	--	

Source: Girls Shape the Future study conducted by Mathematica Policy Research, Inc.

^aReference category.

*/**/***Statistically different from reference category at 10/5/1 percent significance level.

intercourse between the first follow-up and ninth-grade surveys were higher for girls who reported feeling pressure from their friends to have sex (45 percent) than for girls who did not report feeling this type of pressure (24 percent).

- ***Girls were less likely to initiate sexual intercourse if they achieved high grades in school.***

As we described earlier in the report, data from the nationally representative Add Health study suggest that school environment can operate as a protective factor in reducing participation in risky sexual behaviors (Halpern et al. 2000; Resnick et al. 1997). Consistent with this evidence, data from the GSTF study show that girls' grades in their reading classes are strongly associated with the risk of early involvement in sexual activity. Compared with girls who reported receiving a C grade or below in their reading classes at the time of the first follow-up survey, girls who reported receiving an A grade in their reading classes were significantly less

likely to initiate sexual intercourse between the first follow-up and ninth-grade surveys (Table 5). The chances of initiating intercourse were 21 percent for girls who received an A grade in their reading classes, compared with 38 percent for girls who received a C grade or below. The chances of initiating intercourse were also lower for girls who received a B grade in their reading classes than for those who received a C grade or below (29 percent versus 38 percent), but the difference is not statistically significant.

By contrast, data from the GSTF study show no significant association between adolescent sexual activity and either attachment to school or participation in extracurricular activities. For attachment to school, Table 5 shows how the chances of initiating sexual intercourse between the

TABLE 5
PREDICTED PROBABILITY OF INITIATING SEXUAL INTERCOURSE,
BY SCHOOL-RELATED FACTORS

School-Related Factors	Probability (Percentage)	p-value	Sample Size
Grade in Last Reading Class			
A or 90 to 100	21.2	.05*	363
B or 80 to 90	28.7	.31	
C, D, F, or below 80 ^a	37.8	--	
Attachment to School			
Low ^a	26.2	--	358
Medium	22.7	.58	
High	32.3	.36	
Number of Extracurricular Activities in Which Girl Participated During Past Year			
0 or 1	25.7	.89	363
2 – 4 ^a	24.8	--	
5 or more	33.3	.17	

Source: Girls Shape the Future study conducted by Mathematica Policy Research, Inc.

^aReference category.

*/**/** Statistically different from reference category at 10/5/1 percent significance level.

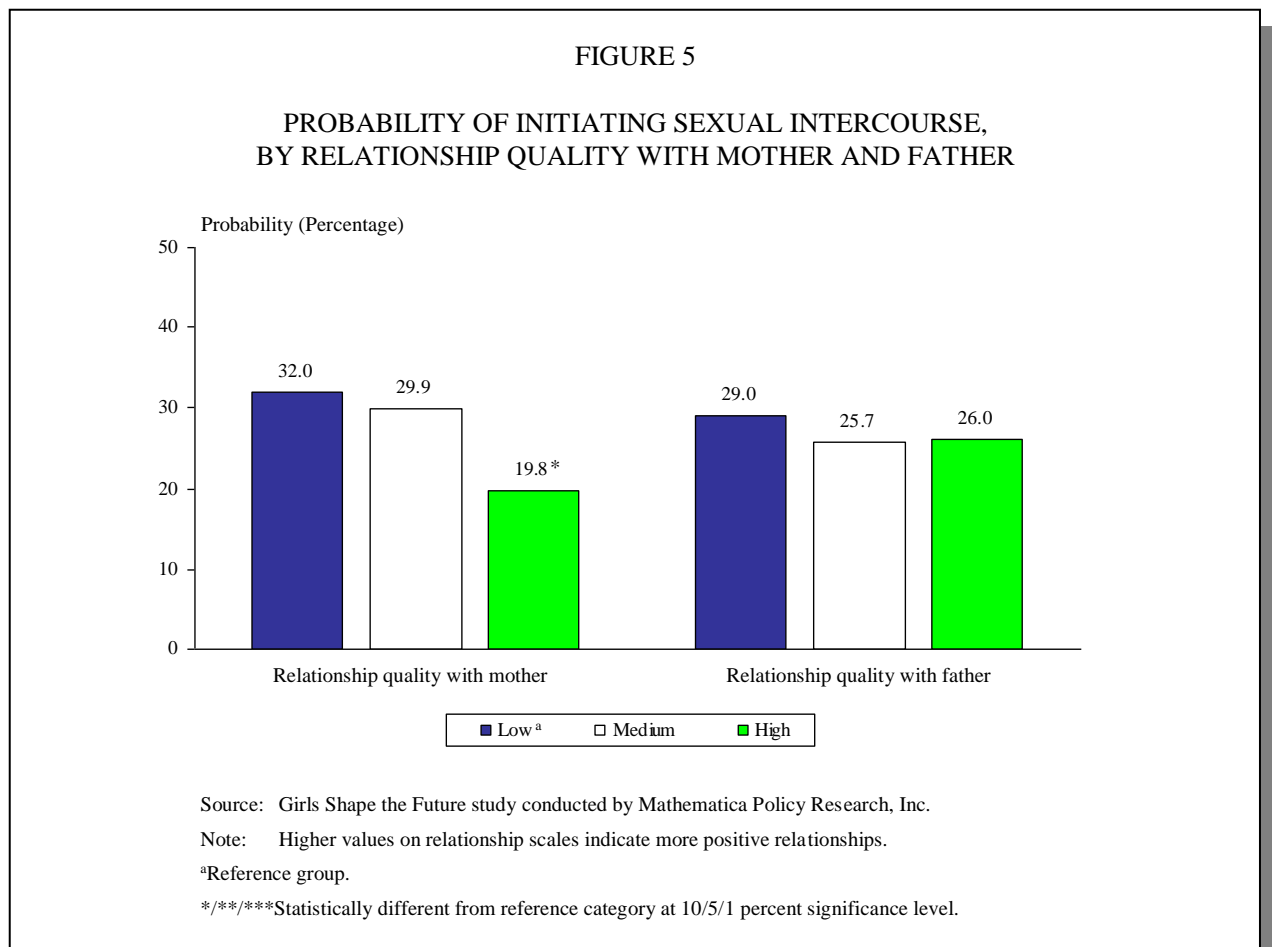
first follow-up and ninth-grade survey relate to a four-point summary scale measuring girls' level of attachment to school. We compared girls who scored in the bottom third of the scale to those who scored in the middle or top thirds of the scale. Higher values indicate greater attachment to school. The types of questions included in the scale asked girls whether they found it easy to make friends at school, enjoyed their classes, and felt safe at school (see Appendix A for a list). The chances of initiating sexual intercourse were higher for girls who reported the closest attachment to school (32 percent) than for those who reported the least attachment (26 percent), but the difference is not statistically significant. It is possible that this scale also partly measures girls' popularity in school, as reflected in the question about making friends (see Appendix A). If the scale measures popularity in addition to level of attachment, this could explain why the chances of initiating sexual intercourse were higher for girls in the top third of the scale than for those in the middle or bottom thirds.

For participation in extracurricular activities, there are no significant differences in the chances of initiating sexual intercourse between girls who participated in a few activities (two to four) during the past year and either (a) girls who participated in many activities (five or more) or (b) those who participated in very few activities (one or fewer). We found similar results when looking at participation in specific types of activities, including musical groups (band, orchestra, or choir) and church or religious activities (not shown). The overall rate of activity participation was high among the girls in our sample, with over 90 percent having participated in at least one activity during the past year. This high participation rate may partly explain why the correlation between activity participation and sexual intercourse is not stronger among the girls in our sample. There may be larger differences in sexual activity when comparing girls who participate in extracurricular activities with those who do not participate at all.

- *Girls who enjoyed positive relationships with their mothers were less likely to have sex than other study girls.*

Previous studies of adolescent development have found large differences in rates of sexual activity between girls from single-parent families and those from two-parent families (Kirby 2007). However, data from the GSTF study show that the quality of girls’ relationships with their parents—and not their basic family structure—is a stronger predictor of their early involvement in sexual activity.

Figure 5 shows how the chances of initiating sexual intercourse between the first follow-up and ninth-grade surveys relate to two scale scores measuring girls’ perceptions of their relationships with their mothers and fathers. For each scale, we compared girls who scored in



the bottom third of the scale with those who scored in the middle or top thirds of the scale. Higher values indicate more positive relationships. When answering this series of survey questions, girls were asked to think of the one person they considered to be their mother and the one person they considered to be their father, which for most girls was a biological parent but for others was a stepparent, grandparent, or other relative or guardian. We did not distinguish these different mother and father figures in our analysis because the sample size for girls reporting on non-biological parents was too small.

For girls' relationships with their mothers, the chance of initiating sexual intercourse was significantly lower for girls who reported the most positive relationships (20 percent) than for those who reported the least positive relationships (32 percent). There are no significant differences in the chances of initiating intercourse between girls in the middle third of the scale (30 percent) and those in the bottom third (32 percent). The chance of initiating sexual intercourse was also lower for girls who reported the most positive relationships with their fathers (26 percent for girls in the top third of the scale, versus 29 percent for those in the bottom third), but the difference is not statistically significant. The finding of a stronger association for relationship quality with mothers is consistent with previous research on adolescent girls (David and Friel 2001; McNeely et al. 2002).

By contrast, we found no significant differences in girls' sexual activity based on differences in family structure. The chances of initiating sexual intercourse between the first follow-up and ninth-grade surveys were similar regardless of whether girls lived with their mother or mother figure or their father or father figure (not shown).

- ***The strongest predictors of early involvement in sexual activity are views accepting of premarital sex and grades in school reading classes.***

To determine which of the many characteristics discussed in this section are the strongest predictors of girls' early involvement in sexual activity, we estimated a multivariate logistic regression model that controls for the full range of measures of demographic characteristics, attitudes toward sex and taking risks, substance use and negative peer influences, school environment, and family relationships. The model shows how each factor is related to the chances of initiating sexual intercourse between the first follow-up and ninth-grade surveys, controlling for any relationships among the full range of variables included in the model. The full results for this model are presented in Appendix B.

The results of this analysis show that the strongest predictors of girls' adolescent sexual activity are (1) views accepting of premarital sex and (2) grades in school reading classes. For views accepting of premarital sex, the chances of initiating sexual intercourse between the first follow-up and ninth-grade surveys were more than twice as great for girls with the most accepting attitudes toward premarital sex (42 percent) than for girls with the least accepting attitudes (17 percent), controlling for other demographic and personal characteristics (Appendix B). For grades in school reading classes, the chance of initiating sexual intercourse was 47 percent for girls who reported receiving a C grade or below at the time of the first follow-up survey, compared with 26 percent for those who received a B grade and 17 percent for those who received an A grade. The difference in rates between girls who received a C or below and those who received an A is statistically significant at the 10 percent level, adjusting for all other demographic and personal characteristics.

F. WHAT FACTORS PUT GIRLS AT RISK FOR EARLY INVOLVEMENT IN UNPROTECTED SEXUAL ACTIVITY?

The factors that determine when girls start having sex are not necessarily the same as those that determine participation in unprotected sex and other risky sexual behaviors. For example, while girls with accepting attitudes toward sex may be at greater risk for early involvement in sexual activity, they may be just as likely as other girls to use condoms or other types of contraceptives once they become sexually active.

To examine the factors that put girls at risk for early involvement in unprotected sexual activity, we examined the subsample of 93 girls who initiated sexual intercourse between the first follow-up and ninth-grade surveys. This sample is too small to calculate how the chances of engaging in unprotected sex differ according to various demographic and personal characteristics. Instead, we used basic descriptive methods to compare the characteristics of 29 girls who reported having engaged in unprotected sex with the characteristics of the other 64 girls who initiated sexual intercourse during the same period. We measured unprotected sex as reporting no condom use during last sex.

- ***Girls who engaged in unprotected sexual activity had higher rates of substance use, felt less attached to school, and were less likely to participate in extracurricular activities than other sexually active girls.***

Data from the GSTF study show that the girls who reported having engaged in unprotected sexual activity differ from other study girls in three main ways. First, they reported higher rates of substance use. In the first follow-up survey, more than one-third (38 percent) of the girls who engaged in unprotected sex reported the use of any substances (alcohol, tobacco, or marijuana) at the time of the first follow-up survey, compared with 18 percent of other study girls (Table 6). This difference is statistically significant at the 10 percent level. Second, they also felt less attached to school. On a scale ranging from 0 to 3, with higher values indicating greater

TABLE 6
DIFFERENCES IN ATTITUDES AND PERSONAL CHARACTERISTICS,
BY INVOLVEMENT IN UNPROTECTED SEXUAL ACTIVITY

Characteristic (Range)	Partner Used Condom During Last Sexual Intercourse:		Difference	p-value
	No	Yes		
Views accepting of premarital sex (0-3)	1.18	1.20	-.02	.95
Views accepting of teenage sex (0-3)	.85	.64	.21	.21
Views supportive of taking risks (0-3)	1.44	1.42	.02	.86
Any substance use in past month (%)	38.2	18.3	19.9	.07*
Any peer substance use in past month (%)	45.7	47.4	-1.7	.90
Receives pressure from friends to have sex (%)	26.4	28.4	-2.0	.85
Received A in last reading class (%)	31.7	35.7	-4.0	.72
Attachment to school (0-3)	1.90	2.19	-.29	.06*
Number of extracurricular activities (0-13)	2.7	4.2	-1.5	.01**
Participated in:				
Sports team (%)	19.4	54.8	-35.4	<.01***
Church or religious group (%)	28.5	65.6	-37.1	<.01***
Relationship quality with mother (0-3)	2.01	2.29	-.28	.22
Relationship quality with father (0-3)	1.95	2.21	-.26	.28
Sample Size	29	64		

Source: Girls Shape the Future study conducted by Mathematica Policy Research, Inc.

Notes: Scale scores range from 0-3, with higher scores indicating more accepting attitudes toward sex and taking risks, greater attachment to school, or more positive relationships with parents.

*/**/***Statistically different at the 10/5/1 percent significance level.

attachment to school, the 29 girls who had unprotected sex reported an average scale score of 1.90, compared with 2.19 for the other 63 girls in the analysis sample (Table 6). This statistically significant gap of .29 scale points corresponds to a 7 percent difference on the

overall 4-point scale.³ Third, the girls who engaged in unprotected sex were also less likely to have participated in extracurricular activities, especially sports teams and religious groups. For example, less than one-quarter (19 percent) of the girls who engaged in unprotected sex had participated in a sports team in the past year, compared with over half (55 percent) of the other girls who were sexually active. This difference in participation is statistically significant at the 1 percent level.

- ***Involvement in unprotected sexual activity was not significantly associated with girls' attitudes toward sex and risk-taking, their academic achievement, or the quality of their relationships with their parents.***

In contrast to the differences in substance use, attachment to school, and activity participation, there are no significant differences between groups in terms of their attitudes toward sex and risk-taking, academic achievement, or the quality of their relationships with their parents. For example, both groups had similar scores on the scales measuring views accepting of premarital sex, views accepting of teenage sex, and views supportive of taking risks (Table 6). Similarly, nearly equal proportions of both groups reported any peer substance use or feeling pressure from their friends to have sex. The percentage of girls who received a high grade in their last reading class is similar regardless of their involvement in unprotected sexual activity, and there are no significant differences in reported relationship quality with parents. These findings suggest that, for girls in the GSTF study, the risk factors for early involvement in unprotected sexual activity are different from those that put girls at risk for initiating sexual intercourse.

³ We calculated this percentage (7 percent) by dividing the difference between groups (0.29) by the range of the scale (4 points).

G. SUMMARY AND CONCLUSIONS

In this report, we used longitudinal data from the Girls Shape the Future the study to produce new evidence on the early predictors of girls' adolescent sexual behaviors. We examined how girls' sexual risk behaviors change in early adolescence, the social and demographic factors that put girls at risk for early involvement in sexual activity, and the distinctive characteristics of girls who engage in unprotected sexual activity.

We find that rates of sexual activity increase sharply in adolescence. From sixth to ninth grade, the percentage of girls in our sample who reported ever having had sexual intercourse jumped from 3 percent to nearly 30 percent. In addition, among those girls who were sexually active, the percentage who reported not using a condom the last time they sex increased from 25 percent to 30 percent between seventh and ninth grades. These rates are very similar to those reported in national data sets for girls in this age group.

As rates of sexual activity increased, the girls in our sample also developed more accepting attitudes toward sex. For example, when asked whether it is okay for teenagers to have sex if they have been dating for a long time, the percentage of girls who agreed with this statement increased from 19 percent to 31 percent. The percentage of girls who felt it is okay for teens to have sex if they use birth control also increased.

We find that the strongest predictors of early involvement in sexual activity include (1) academic achievement and (2) attitudes toward sex. For academic achievement, girls who reported receiving high grades in their reading classes at the time of the first follow-up survey had a 17 percent chance of initiating sexual intercourse before the ninth-grade survey, compared with a 46 percent chance for girls who reported receiving low grades in their reading classes. For attitudes toward sex, the chances of initiating sexual intercourse were more than twice as great for girls who expressed the most accepting attitudes than for those who were least accepting

(42 percent versus 17 percent). These estimates are adjusted for differences between groups in demographic and other personal characteristics. However, the results are similar when the estimates are not adjusted in this way.

We also find evidence that the chances of initiating sexual intercourse are related to several other personal and family characteristics, including negative peer influences, substance use, and family relationships. In particular, girls in our sample were more likely to initiate sexual intercourse if they reported receiving pressure from their friends to have sex, having used drugs or alcohol in the past month, or having less positive relationships with their parents, especially their mothers. However, these correlations are not as strong after adjusting for other demographic and personal characteristics, especially academic achievement and attitudes toward sex.

Finally, we find that a different set of factors is related to girls' involvement in unprotected sexual activity. Among the girls in our sample who were sexually active, those who reported involvement in unprotected sexual activity had higher rates of substance use, felt less attached to school, and were less likely to participate in extracurricular activities. Participation in sports and church or religious groups in particular was lower among girls who engaged unprotected sex than among other sexually-active study girls. These findings are based on a relatively small sample of 93 girls and do not adjust for differences between groups in demographic or other personal characteristics. Future studies should examine whether similar patterns are found in larger national datasets.

These findings represent one of the broadest and most recent assessments to date of the sexual behaviors and attitudes of adolescent girls during the middle school and early high school years. Prior studies have identified many individual risk and protective factors that relate to involvement in adolescent sexual activity (Kirby 2007). However, few studies have pulled this

information together to look simultaneously both at changes in girls' attitudes and behaviors and how a wide array of demographic and personal characteristics relate to involvement in both sexual intercourse and unprotected sexual activity.

Our findings also have practical implications for programs aimed at reducing high rates of risky sexual behaviors among U.S. adolescents. First, our findings for the early predictors of sexual intercourse suggest that programs for younger girls should consider academic achievement and general attitudes toward sex as two possible mechanisms for delaying the initiation of adolescent sexual activity. In his recent review of sexuality education and pregnancy prevention programs, Kirby (2007) notes that although the developers and operators of youth risk-reduction programs cannot directly control adolescents' sexual behaviors, they can still hope to influence these behaviors indirectly by targeting the factors that put teens at risk for early involvement in sexual activity. Our findings indicate that girls' academic achievement and attitudes toward sex are two such factors. Both are strongly predictive of girls' later involvement in sexual activity and both may be amenable to change through intervention. Finding ways to promote meaningful and sustained change in these factors should be an important consideration for future youth programs.

Second, when discussing girls' attitudes toward sex, programs should focus especially on possible changes in attitudes occurring during the transition from middle school to high school. Our findings concerning trends in girls' attitudes show that although most girls disapprove of premarital and teenage sex as middle school students, they develop more accepting attitudes during the transition to high school. The findings of other recent studies suggest that this trend toward more accepting attitudes toward sex continues throughout the high school years (Trenholm et al. 2007). These findings suggest that a successful program focused on youth attitudes toward sex must find ways to both encourage healthy attitudes among middle school

students and then sustain these attitudes as teens grow older and face new experiences and challenges as high school students.

Third, our findings for the early predictors of unprotected sexual activity suggest that programs may need to adapt their focus as girls age and have their first experiences with sexual activity. In particular, to encourage safe and healthy behaviors among girls after they become sexually active, it may be less important to focus on their general attitudes toward sex than on issues such as substance use, attachment to school, and participation in extracurricular activities—the three factors most closely associated with unprotected sexual activity among the girls in our sample. More generally, program developers and operators should consider that effective programs for delaying the initiation of sexual activity may look different than effective programs for reducing the risk of sexually transmitted infections and risky behaviors among sexually-active girls.

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APPENDIX A

DESCRIPTION OF SURVEY QUESTIONS INCLUDED IN SCALE SCORES

Views Accepting of Premarital Sex

Description: Scale ranges from 0-3, with higher values indicating more accepting attitudes.

Q53. Here are some values and opinions pre-teens and teens have about sex. Please tell us how much you do or do not agree with the following:

- b. It is against my values for me to have sex before I am married.
 - 0 “agree”
 - 1 “mostly agree”
 - 2 “mostly don’t agree”
 - 3 “don’t agree”

- c. It is against one or both of my parents/guardians’ values for me to have sex before I am married.
 - 0 “agree”
 - 1 “mostly agree”
 - 2 “mostly don’t agree”
 - 3 “don’t agree”

Views Accepting of Teenage Sex

Description: Scale ranges from 0-3, with higher values indicating more accepting attitudes.

Q53. Here are some values and opinions pre-teens and teens have about sex. Please tell us how much you do or do not agree with the following:

- j. It is OK for teens to have sex if they use birth control.
 - 0 “don’t agree”
 - 1 “mostly don’t agree”
 - 2 “mostly agree”
 - 3 “agree”

- k. Teens who have been dating for a long time or going steady should have sex if they want to.
 - 0 “don’t agree”
 - 1 “mostly don’t agree”
 - 2 “mostly agree”
 - 3 “agree”

- o. It is OK for teens to have sex if they use a condom to prevent disease.
 - 0 “don’t agree”
 - 1 “mostly don’t agree”
 - 2 “mostly agree”
 - 3 “agree”

p. It is OK to be pregnant as a teen.

- 0 “don’t agree”
- 1 “mostly don’t agree”
- 2 “mostly agree”
- 3 “agree”

q. It is OK for teens to have babies.

- 0 “don’t agree”
- 1 “mostly don’t agree”
- 2 “mostly agree”
- 3 “agree”

Views Supportive of Taking Risks

Description: Scale ranges from 0-3, with higher values indicating more supportive attitudes.

Q30. After reading each sentence, mark the answer that tells us how true the sentence is for you.

a. I would do almost anything on a dare.

- 0 “don’t agree”
- 1 “mostly don’t agree”
- 2 “mostly agree”
- 3 “agree”

b. I like to test myself sometimes by doing something a little risky.

- 0 “don’t agree”
- 1 “mostly don’t agree”
- 2 “mostly agree”
- 3 “agree”

c. I keep out of trouble at all costs.

- 0 “agree”
- 1 “mostly agree”
- 2 “mostly don’t agree”
- 3 “don’t agree”

d. I often act before I think.

- 0 “don’t agree”
- 1 “mostly don’t agree”
- 2 “mostly agree”
- 3 “agree”

e. Before I do something, I think about what my friends would think about it.

- 0 “agree”
- 1 “mostly agree”
- 2 “mostly don’t agree”
- 3 “don’t agree”

Attachment to School

Description: Scale ranges from 0-3, with higher values indicating greater attachment to school.

Q4. There are many ways that students describe their schools. Please read each sentence and tell us how much you do or do not agree with the following:

- a. It's easy to make friends at my school.
 - 0 "don't agree"
 - 1 "mostly don't agree"
 - 2 "mostly agree"
 - 3 "agree"

- b. Most of my classes are boring.
 - 0 "agree"
 - 1 "mostly agree"
 - 2 "mostly don't agree"
 - 3 "don't agree"

- c. You can get away with almost anything at my school.
 - 0 "agree"
 - 1 "mostly agree"
 - 2 "mostly don't agree"
 - 3 "don't agree"

- d. Most teachers are willing to help kids with their school problems.
 - 0 "don't agree"
 - 1 "mostly don't agree"
 - 2 "mostly agree"
 - 3 "agree"

- e. I feel safe at school.
 - 0 "don't agree"
 - 1 "mostly don't agree"
 - 2 "mostly agree"
 - 3 "agree"

Participation in Extracurricular Activities

Description: Scale ranges from 0-13, indicating total number of activities.

Q8. Please mark each activity that you do (or have done in the past 12 months) in school, after school, or on weekends.

- a. Band, orchestra, choir, or other musical group
- b. Music lessons
- c. Girls Inc. programs
- d. School play or musical

- e. Student government or student council
- f. Academic clubs like math club or Spanish club
- g. Hobby clubs like photography, chess
- h. Sports teams
- i. Individual physical activities like dance or gymnastics
- j. Girl Scouts
- k. Youth programs, like Boys and Girls clubs, 4-H, YWCA, or YMCA
- l. Community service or volunteer activity
- m. Church or religious youth groups

Relationship Quality with Mother

Description: Scale ranges from 0-3, with higher values indicating a more positive relationship.

Q19. Here are some statements about you and your mother (or the person who is like a mother to you.) For each one, mark a box to tell us how much you do or do not agree with the following:

- a. She is warm and loving toward me.
 - 0 “don’t agree”
 - 1 “mostly don’t agree”
 - 2 “mostly agree”
 - 3 “agree”

- c. When I do something seriously wrong, she helps me understand why it is wrong
 - 0 “don’t agree”
 - 1 “mostly don’t agree”
 - 2 “mostly agree”
 - 3 “agree”

- d. I like the way she and I talk with each other
 - 0 “don’t agree”
 - 1 “mostly don’t agree”
 - 2 “mostly agree”
 - 3 “agree”

- e. I like my relationship with her
 - 0 “don’t agree”
 - 1 “mostly don’t agree”
 - 2 “mostly agree”
 - 3 “agree”

Relationship Quality with Father

Description: Scale ranges from 0-3, with higher values indicating a more positive relationship.

Q24. Here are some statements about you and your father (or the person who is like a father to you.) For each one, mark a box to tell us how much you do or do not agree with the following:

a. He is warm and loving toward me.

0 “don’t agree”

1 “mostly don’t agree”

2 “mostly agree”

3 “agree”

c. When I do something seriously wrong, he helps me understand why it is wrong

0 “don’t agree”

1 “mostly don’t agree”

2 “mostly agree”

3 “agree”

d. I like the way he and I talk with each other

0 “don’t agree”

1 “mostly don’t agree”

2 “mostly agree”

3 “agree”

e. I like my relationship with him

0 “don’t agree”

1 “mostly don’t agree”

2 “mostly agree”

3 “agree”

APPENDIX B

MULTIVARIATE REGRESSION RESULTS

TABLE B.1

MULTIVARIATE ESTIMATES OF THE PROBABILITY OF INITIATING SEXUAL INTERCOURSE,
BY DEMOGRAPHIC AND PERSONAL CHARACTERISTICS

Characteristics	Predicted Probability (Percentage)	p-value
Demographics		
Age		
14 years ^a	14.2	--
15 years	24.1	.15
16 years or older	30.2	.11
Racial/ethnic background		
White ^a	19.6	--
African American	29.7	.27
Hispanic	25.1	.56
Other	16.1	.77
Receives free or reduced price school lunch		
Yes	27.8	.34
No ^a	20.4	--
Attitudes Toward Sex and Taking Risks		
Views Accepting of Premarital Sex		
High	42.3	.02**
Medium	20.8	.60
Low ^a	17.2	--
Views Accepting of Teenage Sex		
High	25.0	.58
Medium	27.1	.45
Low ^a	20.3	--
Views Supportive of Taking Risks		
High	28.9	.18
Medium	24.6	.29
Low ^a	16.9	--
Substance Use and Negative Peer Influences		
Any Substance Use in Past Month		
Yes	39.9	.16
No ^a	23.9	--
Any Peer Substance Use in Past Month		
Yes	23.4	.95
No ^a	22.9	--
Don't Know	26.1	.72
Friends Give Pressure to Have Sex		
Yes	40.0	.10
No ^a	21.6	--

TABLE B.1 (continued)

Characteristics	Predicted Probability (Percentage)	p-Value
School Environment		
Grade in Last Reading Class		
A or 90 to 100	17.1	.01*
B or 80 to 90	25.9	.10
C, D, F or below 80 ^a	46.5	--
Attachment to School		
Low ^a	19.5	--
Medium	21.0	.84
High	30.9	.17
Extracurricular Activities		
0 to 1	14.4	.19
2 to 4 ^a	23.8	--
5 or more	31.5	.39
Family Relationships		
Lives with Mother		
Yes	23.8	.90
No ^a	25.8	--
Lives with Father		
Yes	26.5	.28
No ^a	19.7	--
Relationship with Mother		
Low ^a	26.1	--
Medium	28.8	.76
High	17.3	.29
Relationship with Father		
Low ^a	23.7	--
Medium	21.5	.78
High	28.7	.59
Sample Size	214	

Source: Girls Shape the Future study conducted by Mathematica Policy Research, Inc.

^aReference group.

*Significantly different from reference group at 10 percent level (two-tailed test).