

Understanding Changes in Sexual Activity Among Young Metropolitan Men: 1979–1995

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Context: *Changes in the sexual behavior of teenagers can have a significant impact on levels of adolescent pregnancy and transmission of sexually transmitted diseases (STDs). Understanding the role played by attitudes and educational efforts will provide critical prevention information.*

Methods: *Data on the sexual behavior, sexual attitudes, educational experiences and demographics of 2,087 never-married metropolitan males aged 17–19 from the 1979 National Survey of Young Men and the 1988 and 1995 waves of the National Survey of Adolescent Males were analyzed through multivariate methods to examine factors that predict sexual behavior as well as those that predict sexual attitudes.*

Results: *The percentage of males aged 17–19 who had ever had sex increased from 66% in 1979 to 76% in 1988 and then decreased to 68% in 1995. The frequency of sexual intercourse in the year prior to the survey increased significantly over time, although the lifetime number of sexual partners did not. Acceptance of premarital sex increased significantly from 1979 to 1988, then decreased significantly from 1988 to 1995. Over time, young men were increasingly likely to prefer having and supporting a baby to marriage, abortion or adoption as the resolution to a nonmarital pregnancy. Trends in attitudes were strongly associated with sexual behaviors, with more conservative attitudes predicting less sexual activity. AIDS education, which was nearly universal in 1995, was associated with decreased sexual activity, although not among black youths.*

Conclusions: *More conservative sexual attitudes and increased exposure to AIDS education are key predictors of decreased sexual activity among adolescent males. However, broader societal factors, such as fear of AIDS and increased awareness of problems associated with teenage pregnancy and STDs, may underlie both attitudinal and behavioral changes.*

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period of increasing (1979 to 1988) then decreasing (1988 to 1995) sexual activity. By examining time periods with reversing trends, we have a relatively strong framework within which to understand factors related to both increased and decreased sexual activity.

Methods

Sources of Data

Our data come from three nationally representative household surveys of young men: the 1979 National Survey of Young Men (NSYM)⁶ and the 1988 and 1995 waves of the National Survey of Adolescent Males (NSAM-88 and NSAM-95, respectively).⁷ In addition, we also use some data from a 1991 follow-up of the 1998 cohort. Each survey involved a multistage national probability sample of households in the coterminous United States, and each included weights that adjusted for sampling, nonresponse and poststratification to correspond with census targets. Each survey involved both in-person interviews and self-administered questionnaires and asked questions specifically concerning the sexual and contraceptive behaviors of adolescents; each included attitudinal and

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Survey data collected from the 1950s through the 1980s indicate that the proportion of teenagers who are sexually experienced has increased steadily.¹ However, recent studies show that the proportion who are sexually active began to decline during the 1990s.² Among teenage males, for example, those who had ever had sex decreased from 60% in 1988 to 55% in 1995.³ In addition, condom use among sexually active youths increased during the 1980s and 1990s,⁴ while pregnancy rates and birthrates among teenage women have decreased over the last several years.⁵

Taken together, these findings appear to signal a change in adolescents' sexual and reproductive risk-taking behavior. These changes are particularly noteworthy, given that concerns about adolescent pregnancy, sexually transmitted diseases (STDs) and AIDS have led private be-

haviors such as these to be of consequence to public policy and public health.

What might account for these shifts in sexual behavior? Changes in teenagers' behavior may be related to shifts in their attitudes about sex and pregnancy, reflecting changes in broader societal norms about sexual behavior. Alternately, public concern about AIDS, STDs and adolescent pregnancy, which has resulted in heightened levels of education around these issues, may have played a role in reducing sexual activity. It is often difficult to discern the true root causes of such social phenomena, however.

In this article, to examine how attitudes and educational experiences might influence sexual behavior, we analyze three cohorts of unmarried metropolitan teenage males: those aged 17–19 in 1979, in 1988 and in 1995. These time frames capture a

demographic measures as well.

Each survey included a slightly different age range, and the NSYM surveyed only residents of metropolitan areas.* We aligned populations and questions that were common across each of the surveys, excluding men aged 20–21 in the NSYM and those aged 15–16 in the NSAM-88 and the NSAM-95, deleting nonmetropolitan youths in both NSAM surveys and omitting ever-married respondents in the NSYM and the NSAM-95. (Only never-married males were interviewed in the NSAM-88.) The resulting pooled data set included 2,087 never-married males aged 17–19 living in households in metropolitan areas of the contiguous United States in one of the three survey years. For the 1991 follow-up survey, we reinterviewed 1,676 of the original 1998 respondents, as described previously.⁸ Race and ethnicity information was limited in the 1979 survey, so respondents are identified as being either black or nonblack. The unweighted sample sizes and the weighted percentage distributions are shown in Table 1. All data presented in this article are weighted.

There were some important methodological differences between the surveys. In the 1979 NSYM, data about heterosexual behavior were collected with a self-administered questionnaire, while in the NSAM-88 and NSAM-95, most data were collected from personal interviews. Prior methodological research⁹ indicates that questions about most heterosexual behaviors are not highly sensitive and that responses obtained in interviews are not significantly different from those obtained from self-administered questionnaires. Thus, we believe that data from the three surveys are comparable. Nonetheless, we controlled for year of survey in our multivariate analyses as a further analytic safeguard against potential bias.

Variables

We selected variables on the basis of two criteria: their theoretical applicability, as reflected in prior research, and the availability of comparable data for the 1979, 1988 and 1995 cohorts. The latter criterion ultimately was much more constraining; while the 1988 and 1995 data sets overlapped extensively, both had limited comparability with the 1979 survey. Therefore, factors such as the number of sex partners in the last 12 months and maternal employment, which were not available from the 1979 data set, could not be included as variables in the analyses.

We used four measures of heterosexual activity as outcome variables: ever having had sex; having had sex in the last four

weeks; lifetime number of sex partners; and number of acts of intercourse in the last 12 months. Data for lifetime partners and acts of intercourse in the last 12 months were highly skewed. Therefore, we capped the variables at a maximum of 20 lifetime partners and 100 acts of intercourse in the past 12 months. In the 1979 survey, the number of acts of intercourse in the last 12 months was estimated based on responses to a specific question, while in the 1988 and 1995 survey, estimates were computed based on partner-by-partner data.¹⁰ The 1995 survey also included a direct question about the number of acts of intercourse, which could be compared with the computed estimates. The self-reports and computed estimates converged nicely; the means were not significantly different and the correlation coefficient was 0.86, suggesting that the accuracy of the 1979 data was comparable to that of the 1988 and 1995 surveys.

We used two measures to examine youths' attitudes about sex: a question measuring support for premarital sex, and one examining how the respondent might resolve a nonmarital pregnancy. The wording of the premarital sex question was "Which one of these statements best describes how you feel about sexual intercourse before marriage: (1) Sexual intercourse before marriage is okay even if the couple has no plans to marry, (2) sexual intercourse before marriage is okay but only if the couple is planning to marry, (3) sexual intercourse before marriage is never okay."[†]

The question about nonmarital pregnancy resolution posed the following scenario: "Consider the case of a young man who has made an unmarried girl pregnant. He likes her but does not love her." Responses concerning how to resolve the situation were grouped into four categories: (1) get married, (2) have the baby and support it, (3) suggest abortion and (4) suggest adoption/other. (This last option included giving the baby to a relative to raise, and also allowed for open-ended responses.)[‡]

Receipt of three types of school-based sex education was examined: education about birth control (whether respondents were instructed about contraceptive methods or about where to obtain them); education about AIDS (either general information or information about how to prevent HIV infection through safer sex); and education about STDs (referred to as "venereal disease" in the 1979 and 1988 surveys). Variables about parental communication or other instructional areas, such as how to say "no" to sex and how pregnancy occurs, were not available in all three years. There were no education questions regarding

Table 1. Percentage distribution of never-married metropolitan males aged 17–19, by selected characteristics, according to year of survey, National Survey of Young Men (NSYM) and National Survey of Adolescent Males (NSAM)

Characteristic	1979 NSYM	1988 NSAM	1995 NSAM
Race			
Black	17.7	16.9	17.1
Nonblack	82.3	83.1	82.9
Age			
17	36.6	37.5	35.6
18	33.9	36.6	32.9
19	29.5	25.9	31.5
Region			
South	26.0	30.1	37.1
North	22.8	23.9	15.6
Midwest	33.1	24.2	20.2
West	18.1	21.7	27.2
Family structure at age 14			
Mother and father	70.4	69.3	70.1
Mother and other adult	6.1	7.6	6.3
Mother only	16.1	16.7	14.6
No mother present	7.4	6.4	9.0
Education			
Behind in school	17.8	15.9	18.3
Not behind in school	82.2	84.1	81.7
Total	100.0	100.0	100.0
Sample N (unweighted)			
Total	609	745	733
Unweighted blacks	257	288	221
Unweighted nonblacks	352	457	512

HIV or AIDS in the 1979 survey (AIDS education did not exist before the 1980s).

The multivariate analyses included a number of control variables that prior research suggests are related to sexual behavior.¹¹ Family structure, which may have an impact on social stress and degree of parental supervision, includes the following options: mother and father; mother and her partner (not the father); mother only; and other family type. Region of residence, which may be associated with distinct cultural norms, was also included.

*Metropolitan areas, as defined by the U.S. Census Bureau, include cities and their surrounding suburbs.

†In the 1988 and 1995 surveys, the most permissive response to this question was subdivided into two responses: "Sexual intercourse before marriage is okay as long as the couple is close, even if they don't plan to marry," and "Sexual intercourse before marriage is okay if both people agree to it." For these analyses, we collapsed these two responses and treated them as equivalent to the first response.

‡In the 1988 and 1995 surveys, the original responses were: "(1) suggest she end the pregnancy, (2) suggest she have the baby and he will help support it, (3) suggest she have the baby and put it up for adoption, (4) suggest she have the baby and give it to a relative to raise, (5) marry her; or (6) other." In 1979, the fourth category was not offered, but the specific response "not take any responsibility" was. In that survey, respondents could also offer open-ended responses, which included "her decision," "joint decision," "leave her" and "don't know."

Table 2. Selected measures of sexual activity among never-married males aged 17–19, by race, according to year of survey

Measure	1979 NSYM†	1988 NSAM‡	1995 NSAM	p§
All				
% ever had sex	65.7***	75.5**	68.2	.001
% had sex in last four weeks	40.0	44.8*	38.7	.044
Average no. of lifetime partners	4.1	3.8	3.6	ns
Average no. of acts of intercourse in last 12 months	14.0	17.1*	20.9	.001
Black				
% ever had sex	71.1***	87.8	87.6	.001
% had sex in last four weeks	47.3***	60.0	62.5	.001
Average no. of lifetime partners	5.1	6.2	6.9	.009
Average no. of acts of intercourse in last 12 months	12.3	12.5***	24.2	.001
Nonblack				
% ever had sex	64.5**	73.0**	64.2	.006
% had sex in last four weeks	38.5	41.7*	33.8	.038
Average no. of lifetime partners	3.8	3.3	2.9	.016
Average no. of acts of intercourse in last 12 months	14.3	18.1	20.2	.017

*p≤.05. **p≤.01. ***p≤.001. †Significant difference refers to comparison between 1979 and 1988. ‡Significant difference refers to comparison between 1988 and 1995. §Refers to difference across all survey years.

Religiosity, a measure of the importance of religious and moral beliefs, was coded on a four-point scale, with higher values indicating a greater importance of religion. Although research suggests that adherence to fundamentalist Christianity is associated with changes in sexual behavior,¹² religious affiliation was excluded due to survey and coding incompatibility that would have biased our results. However, we anticipated that religiosity would capture much of the same effect. Maternal education was included as a proxy for socioeconomic status, and was coded on a four-point scale, with higher values indicating more education.

Analytic Methods

In the bivariate analyses, we compared changes in key variables across time. We tested for global differences among the 1979, 1988 and 1995 cohorts, as well as for pairwise differences between the 1979 and 1988 cohorts and between the 1988 and

*Tobit is comparable to a combination of logistic and ordinary least squares regression; it simultaneously estimates the probability that an event occurs (i.e. having had sex) and, for those who have had sex, it estimates the number of acts of intercourse. (Source: Maddala GS, *Limited Dependent and Qualitative Variables in Econometrics*, Cambridge, UK: Cambridge University Press, 1983.)

†We also used data from the 1988 and 1995 surveys (data were not available for 1979) to examine changes in the number of sexual partners in the 12 months prior to the survey and in the number of acts of intercourse per partner in that time period. Among those who had had sex in the last year, the mean number of partners was not significantly different (2.1 in 1988 vs. 2.4 in 1995), but the mean number of acts of intercourse per partner increased from 16 in 1988 to 22 in 1995 (p<.001). Blacks had fewer acts of intercourse per relationship than did nonblacks (p<.001).

months prior to the survey. We used logistic regression to estimate the model for recent intercourse; a tobit model was used for number of acts of intercourse in the last year because of the large number of individuals who had never had sex or had not had sex in the last year.*

Results

Trends in Sexual Activity

Trends in sexual activity are presented in Table 2. (Unless stated otherwise, all results discussed are statistically significant at p≤.05 and refer to comparisons across all three cohorts.) The proportion of never-married 17–19-year-old urban males who had ever had sexual intercourse with a female increased from 66% in 1979 to 76% in 1988 and then decreased to 68% in 1995. These changes were confined to nonblack males; rates of sexual experience among black adolescent men increased between 1979 and 1988, and remained relatively constant between 1988 and 1995.

Recent sexual activity is an important measure of current behavior. Among all youths, the percentage of respondents who had had sexual intercourse in the four weeks prior to the survey increased from 40% in 1979 to 45% in 1988 and then decreased to 39% in 1995. The change in the proportion of teenagers having had recent sexual activity between 1988 and 1995 was significant only among nonblack youths; among black youths, the small increase in this variable was not statistically significant.

The average number of lifetime female sex partners among all youths in all three cohorts was four (range of 3.6–4.1). The

1995 groups. For categorical variables, we used chi-square tests, while we used analysis of variance (with the Tukey method for pairwise comparisons) for continuous measures.

Our main interest in the multivariate analyses was the effect of cohort year, attitudes and education on two measures of sexual behavior: having had intercourse in the last four weeks; and number of acts of intercourse in the 12

average number of partners decreased significantly among nonblack adolescent men, from 3.8 in 1979 to 2.9 in 1995, while the mean increased among black teenagers, from 5.1 in 1979 to 6.9 in 1995.

The average frequency of heterosexual intercourse among all teenage males in the 12 months prior to the survey increased significantly overall, from 14 acts per year in 1979 to 17 per year in 1988 and to 21 acts per year in 1995.† The overall change in frequency among nonblack youths paralleled the findings among all youths. Among black adolescents, however, there was no change in the frequency of intercourse between 1979 and 1988, whereas between 1988 and 1995 average frequency increased from 13 acts per year to 24 acts per year.

In each time period, black adolescent males were more likely to have ever had sex and to have had more lifetime partners than were nonblack males. However, the average annual frequency of intercourse was similar between black and nonblack teenage men.

Trends in Attitudes and Education

The proportion of adolescent men who approved of premarital sex when a couple does not plan to marry increased from 55% in 1979 to 80% in 1988 and then decreased to 71% in 1995 (Table 3). The pattern and distribution of attitudes were similar between black and nonblack respondents. However, there was a significant decrease between 1988 and 1995 in the percentage of nonblack teenagers approving of premarital sex; a similar change did not occur among black youths.

There was a large and significant increase in the percentage of adolescent males who, when faced with a hypothetical nonmarital pregnancy, endorsed having the baby and supporting it: This choice was selected by 19% of youths in 1979, 37% in 1988 and 59% in 1995. All other alternatives—getting married, suggesting adoption or suggesting abortion—became less popular over time. The distribution of attitudes was similar between black and nonblack adolescent men in 1995, but differed markedly by race in earlier time periods. In 1988, for example, blacks were almost twice as likely as nonblacks to endorse having the baby and supporting it, while nonblacks were nearly twice as likely as blacks to support either abortion or adoption.

As shown in Table 4, instruction in topics concerning birth control, STDs and AIDS became increasingly common between 1979 and 1995. Receipt of AIDS education was nearly universal among all

Table 3. Percentage distribution of never-married metropolitan males aged 17–19, by attitudes about premarital sex and nonmarital pregnancy resolution, according to respondent's race and survey year

Attitude	1979 NSYM†	1988 NSAM‡	1995 NSAM	P§
PREMARITAL SEX				
All				
Okay if couple doesn't plan to marry	54.8***	80.2***	71.1	.001
Okay only if couple plans to marry	30.8	10.7	14.9	
Never okay	14.4	9.1	14.0	
Black				
Okay if couple doesn't plan to marry	58.6***	78.2	74.3	.001
Okay only if couple plans to marry	29.0	10.3	12.7	
Never okay	12.4	11.6	13.0	
Nonblack				
Okay if couple doesn't plan to marry	54.0***	80.6***	70.4	.001
Okay only if couple plans to marry	31.2	10.8	15.4	
Never okay	14.8	8.6	14.2	
NONMARITAL PREGNANCY RESOLUTION				
All				
Get married	18.1***	9.9***	8.0	.001
Have baby, and help support it	19.1	36.9	59.3	
Suggest abortion	24.8	19.8	14.2	
Suggest adoption/other	38.2	33.5	18.6	
Black				
Get married	3.6***	10.5**	4.3	.001
Have baby, and help support it	9.8	61.8	71.4	
Suggest abortion	26.5	13.6	17.3	
Suggest adoption/other	60.0	14.1	7.1	
Nonblack				
Get married	21.2***	9.8***	8.8	.001
Have baby, and help support it	21.1	31.7	56.7	
Suggest abortion	24.4	21.0	13.5	
Suggest adoption/other	33.4	37.5	21.0	
Total	100.0	100.0	100.0	

p≤.01. *p≤.001. †Significant difference refers to comparison between 1979 and 1988. ‡Significant difference refers to comparison between 1988 and 1995. §Refers to difference across all survey years.

youths (96%) in 1995, and a majority of teenage males in 1995 reported being taught about both birth control and STDs (87% and 88%, respectively).

Multivariate Models

• *Effects on behavior.* We used multivariate models to examine whether changes in attitudes or education might explain differences in sexual behavior. We examined only those outcome variables that might correspond with attitudes held and education received relatively close in time to the date of interview. Thus, for this analysis, we examined only sexual intercourse

*When attitude measures were excluded from the model, religiosity was associated with a decreased likelihood of having had sex recently ($p<.05$). Religiosity is generally correlated with more conservative attitudes; while attitudes mediate some of this association, when they were controlled for in the regression model, the measure was associated with increased sex. While a person with greater religiosity is, in general, more likely to have conservative attitudes and less likely to have had recent sex, the analyses suggest that if we compare religious and nonreligious youths who are matched for attitudes, religious respondents are more likely to have had sex. Excluding the attitudes did not substantially change the correlation of other variables.

attitudes become significantly more conservative over the same time period during which behaviors change, we might not find significant direct effects for time, since changes over time will be captured by shifts in attitudes. Finally, the relationship of attitudes or of other factors to sexual behavior might change over time; some factors might be more strongly associated with a behavior at one point in time than at another. We investigated this by systematically interacting the cohort year with all attitude and sex education variables. Any significant main effects were tested for interactions; we tested for race interactions as well. In our final models, we eliminated interaction terms that were not significant at $p<.05$.

We did not restrict the analyses to sexually active respondents. Insofar as there are changes in the proportion of sexually active young men over time, including only sexually active respondents could have created a selection bias.

The results of the logistic regression model for having had sex in the four weeks prior to the survey are presented in the first

column of Table 5 (page 260). Cohort year was not significantly associated with recent sexual activity, indicating that cohort effects present in the bivariate analyses are primarily mediated by other variables.

Attitudes about premarital sex were strongly correlated with recent sexual activity. Adolescent males who completely disapproved of premarital sex were far less likely to have had sex recently than were those who approved of it. Attitudes toward the resolution of nonmarital pregnancy also were related to recent sexual behavior: Teenagers who favored marriage as the resolution for a nonmarital pregnancy were significantly less likely to have had sex in the four weeks prior to the survey than were adolescents who endorsed having the baby and supporting it or those who preferred abortion. Although the odds ratio for adoption was not significant, its value was similar to the odds ratios for both the "have baby, and help support it" and the "suggest abortion" responses.

Respondents who had received education about AIDS or STDs were significantly less likely than others to report having had sex in the four weeks prior to the survey. Those receiving birth control education were no more likely to report recent sexual behavior than were youths who had not received such instruction, however.

After controlling for traits such as family structure and educational attainment, we found that race was not significantly related to recent sexual activity. More religious respondents were significantly more likely than less religious respondents to have had recent sexual activity.* Being older, being behind in school and growing up either with only the mother

or the father were also significantly associated with recent sexual activity. More religious respondents were significantly more likely than less religious respondents to have had recent sexual activity.* Being older, being behind in school and growing up either with only the mother

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Table 4. Percentage of never-married metropolitan males aged 17–19 who received sex education, by type of education and by race, according to survey year

Type of education	1979 NSYM†	1988 NSAM‡	1995 NSAM	p§
All races				
Birth control	62.4***	81.6**	87.3	.001
STD	72.9***	84.1*	87.9	.001
AIDS	0.0***	64.0***	95.8	.001
Black				
Birth control	67.2***	81.0***	92.0	.001
STD	70.8***	83.6	88.7	.001
AIDS	0.0***	76.3***	97.4	.001
Nonblack				
Birth control	61.4***	81.7*	86.3	.001
STD	73.4***	84.1	87.8	.001
AIDS	0.0***	61.5***	95.5	.001

*p≤.05. **p≤.01. ***p≤.001. †Significant difference refers to comparison between 1979 and 1988. ‡Significant difference refers to comparison between 1988 and 1995. §Refers to difference across all survey years.

Table 5. Odds ratio showing likelihood of having had sex in the last four weeks and tobit coefficients showing likely change in number of acts of intercourse over the last 12 months, by selected characteristics of never-married metropolitan males aged 17–19

Characteristic	Sex in last 4 weeks	Acts of intercourse
Cohort year		
1979	0.93	-21.13***
1995	0.98	6.73**
1988†	na	na
Premarital sex attitudes		
Premarital sex okay		
if plan to marry	0.33***	-18.83***
Never okay	0.09***	-48.82***
Okay even if don't plan to marry†	na	na
Nonmarital pregnancy resolution attitudes		
Have baby, and help support it		
Suggest abortion	1.53*	11.69***
Suggest adoption/other	1.59*	15.92***
Get married†	1.38	12.90***
	na	na
Sex education		
Birth control		
AIDS	1.35	-3.56
STD	0.53***	-10.02***
	0.58**	-2.86
Personal characteristics		
Black		
Age in years	0.93	-9.11*
Behind in school	1.34***	10.62***
Religiosity	1.62***	8.56***
1.15*	0.95	
Region of residence		
North	0.97	-3.75
Midwest	0.83	-2.48
West	0.88	-2.91
South†	na	na
Family background		
Family structure growing up		
Mother only	1.61***	5.09*
Mother and other adult	1.54*	11.66***
No mother present	1.22	7.12*
Mother and father†	na	na
Maternal education	0.99	-2.97**
Maternal education missing	1.27	0.93
Interactions		
Black X AIDS education		
Black X premarital sex never okay	3.02***	12.95**
1979 X STD education	na	20.62**
1979 X maternal education	1.82*	na
1979 X have baby, and help support it	0.75*	na
1979 X birth control education	1.81*	10.57*
	na	16.49***
<i>N</i>	2,027	2,014
Model chi-square	388.87	na
df	26	na
Intercept	na	-173.95***
Sigma	na	36.97
Log-likelihood ratio	na	-6,772.64

*p<.05. **p<.01 ***p<.001. †Reference category. Note: na=not applicable.

present or with the mother and another adult (but not the father) present also were associated with a greater likelihood of recent sexual activity. Maternal education and region of residence were not significant factors.

Interaction effects for sex in the four weeks prior to the survey indicate that receipt of AIDS education was associated with a decrease in recent sexual activity only among nonblack youths. Receipt of STD education was not associated with a decrease among respondents in the 1979 cohort.

To demonstrate the impact of attitude change on sexual behavior, we estimated the proportion of teenage males who would have had sex in 1995 if they held the average attitudes about premarital sex of the 1988 cohort. We entered the mean value of all variables in the 1995 cohort into our regression equation to determine the predicted value for the percentage of males who had had sex in the last four weeks. We then recalculated the regression, substituting the mean value for attitude toward premarital sex in 1995 with the mean value in 1988. Using the 1988 attitude value predicted that an additional 4% of young men would have had sex in the last four weeks. The actual difference between the 1988 and 1995 cohorts in the percentage of males who had intercourse in the four weeks prior to the survey was 6%. Thus, the change in attitudes explains a majority of the difference.

Results of the tobit model for the number of acts of sexual intercourse in the last 12 months are presented in the second column of Table 5.* Even after controlling for other factors, being a member of the 1979 cohort was associated with a significantly lower frequency of intercourse than was being a member of the 1988 cohort, while being a member of the 1995 cohort was associated with a higher frequency of intercourse than being in the 1988 cohort.†

More permissive attitudes about premarital sex were strongly associated with higher rates of intercourse. The preference for marriage as a response to a nonmarital pregnancy was significantly associated with less frequent intercourse in the 12 months prior to the survey, compared with the rates associated with the other possible resolutions. Receipt of AIDS education was significantly associated with less frequent intercourse, whereas receiving birth control or STD education were not.

Several significant interaction effects emerged from the analysis of frequency of sex in the 12 months prior to the survey. Having received AIDS education and having the attitude that premarital sex is never okay were both associated with significantly lower rates of sex among nonblack youths than among black youths. Receipt of birth control education was associated with higher levels of sex in the 1979 cohort, but not in the 1988 or 1995 cohorts.

•*Effects on attitudes.* In the final models, we

examined influences on changes in attitudes over time. The first column of Table 6 presents an ordered logistic regression in which attitude about premarital sex is the dependent variable. In this model, a larger odds ratio is associated with greater disapproval of premarital sex.

Cohort year 1979 was significantly associated with greater disapproval of premarital sex. Education about STDs was associated with less disapproval of premarital sex, but education about AIDS and about birth control were not. Several demographic variables were significantly associated with less disapproval of premarital sex: black race, older age and a family structure that included either the respondent's mother and another adult or no mother. Further, the significant interaction of religiosity and the 1995 cohort indicates that religiosity became more strongly linked to conservative sexual attitudes in 1995. Although the mean level of religiosity did not rise from 1988 to 1995, religious youths became more disapproving of premarital sex in the 1990s.

The second column of Table 6 presents the binary logistic regression model showing the probability of endorsing getting married as a response to a nonmarital pregnancy, compared with all other measured responses. Cohort year was correlated strongly with this attitude: Respondents in 1979 were significantly more likely to support getting married than were those in 1988, and respondents in 1995 were significantly less likely to support marriage than were those in 1988.‡ Receipt of birth control education was associated with less support for getting married, while receipt of STD education was associated with more support for getting married when faced with a nonmarital pregnancy.

The significant interaction term for religiosity and 1995 cohort indicates that while overall attitudes toward getting married in

* Negative tobit coefficients indicate a reduction in the dependent variable, while positive coefficients indicate an increase. For each independent variable, the tobit coefficient expresses the relative strength of the effect of different levels of that variable on the value of the dependent variable. Tobit coefficients cannot be used to compare relative effects across variables.

† In a version of this model that excluded attitude measures, the coefficient for the 1995 cohort was smaller and not significant. Therefore, including attitudes in the model increased the association between frequency of intercourse and 1995 cohort.

‡ The odds ratio for 1995 is surprisingly small (0.01). This result is partly induced by the inclusion in the model of the interaction term between 1995 and religiosity, which had a strong effect in the opposite direction (i.e., in support of marriage). When we excluded this term, the odds ratio for 1995 was 0.8. This result suggests that nonreligious youths were less supportive of marriage in 1995, while religious youth were more supportive.

response to a nonmarital pregnancy waned in 1995, religious youths in this cohort strongly endorsed marriage as the preferred response to a nonmarital pregnancy. Finally, the significant interaction term for race and 1979 cohort indicates that black adolescent males were more likely to endorse marriage in response to a nonmarital pregnancy in 1979 than they were in later years.

•*Reciprocity between attitudes and behaviors.* Data from the 1991 NSAM follow-up survey were used to examine whether sexual attitudes predict behaviors or whether the reverse is true. Among 15–19-year-old virgins who in 1988 believed that premarital sex was never okay, 37% became sexually active by 1991 (not shown). In contrast, 72% of those who believed that premarital sex was okay even if the couple do not plan to marry became sexually active by 1991. Slightly more than half (56%) of those who approved of premarital sex if the couple planned to marry (the intermediate attitude) became sexually active by 1991 ($p < .001$). In addition, males who became sexually active between 1988 and 1991 developed more permissive attitudes: Among those who had been virgins in 1988 but became sexually active by 1991, 67% had approved of sex even if the couple did not plan to marry in the 1988 survey; by 1991, the proportion was 84%. Males who remained virgins had attitudes in 1991 similar to those held in 1988.

Discussion

Teenagers' sexual behavior has changed from the 1970s to 1995, paralleling trends in attitudes. Annual surveys of college freshmen, for example, demonstrate that casual sex has become less acceptable in recent years among both male and female students.¹³ Moreover, these surveys suggest that such changes reflect a growing trend and not merely a unique fluctuation in the sexual beliefs of American youth.

The results presented here suggest that shifting attitudes and an increase in educational efforts targeted toward stemming the AIDS epidemic are key factors associated with recent decreases in sexual behavior among adolescents. Attitudes toward premarital sex have a strong and consistent association with sexual activity: Youths with more conservative attitudes are less likely to have sex, and are likely to have fewer acts of intercourse, than are those with more permissive attitudes.

Sexual attitudes and behaviors should not be viewed as all-inclusive indicators of teenagers' social or moral values, however. For example, 12th-graders' attitudes about marijuana use grew more conserva-

tive during the 1980s, and this decline was associated with a decrease in reported use. In the 1990s, however, drug-related attitudes became permissive, and marijuana use increased.¹⁴ These trends in adolescents' drug-related attitudes and behaviors are roughly the reverse of those relating to sex.

Although this analysis shows that attitudes and behaviors are strongly correlated, we cannot ascertain whether the attitudinal shifts led to the behavioral trends, or whether the reverse is true: While teenagers who disapproved of premarital sex were less likely to engage in that behavior, those who were sexually active were unlikely to express disapproval. Thus, attitudes about premarital sex predicted future behaviors, but behaviors also predicted attitudinal changes.

Because of the reciprocity of attitudes and behaviors, we only demonstrate that attitudes and behaviors are strongly associated, both cross-sectionally and over time. In all likelihood, factors such as fear of AIDS, increased public awareness about teenage pregnancy and other societal trends are underlying factors in both the attitudinal and behavioral changes examined here. Regrettably, the data sources we used did not contain sufficient information to allow us to rigorously examine all of these possibilities.

Our research examined self-reported sexual behaviors, which may be prone to misreporting. A reasonable question, then, is whether these behavioral trends are real. Even if behaviors are misreported at one point in time, trends may still be accurate if the level of over- or underreporting is consistent across time. We found that attitudes about premarital sex became more liberal in 1988 and more conservative in 1995. It is possible that these attitudinal shifts led to biases that affected behavioral reports.

Vital statistics and epidemiologic data confirm, however, that adolescent sexual behaviors became more conservative during the 1988–1995 period. For example, teenage women's birthrates and pregnancy rates declined during the 1990s,¹⁵ and rates of gonorrhea among both male and female adolescents decreased as well.¹⁶ Attitudinal, behavioral and clinical indicators are strikingly consistent in demonstrating that American teenagers moved toward safer sexual behaviors (reduced sexual activity and increased contraceptive and condom use) during the 1990s.

We found that male adolescents are more likely now than in previous years to identify marriage and support of the child as their preferred solution to a nonmarital pregnancy. Clearly, though, these opinions do not

necessarily mean that teenagers endorse regular financial child support for out-of-wedlock births. Nonetheless, this attitudinal change is broadly consistent with recent social movements, represented by groups such as the Promise Keepers or events like the Million Man March, which emphasize greater male responsibility for children, and which bear promise for public policy efforts to heighten fathers' emotional and financial involvement with their children.

Our other key finding concerns the relationship between sex education and level of sexual activity. The receipt of AIDS education was associated with a reduction in sexual activity, an outcome that replicates the findings from other research.¹⁷ Given that attendance in sex education classes is generally required by schools and therefore not a choice for most students, it is unlikely that less sexual activity among those receiving risk-reduction education is because only less-permissive students enroll in these courses. Certainly, these findings

Table 6. Odds ratio showing likelihood of disapproval of premarital sex and of endorsement of marriage as a resolution for a nonmarital pregnancy, by selected characteristics of never-married metropolitan males aged 17–19

Characteristic	Disapproval of premarital sex	Endorsement of marriage
Cohort year		
1979	3.40***	2.11***
1995	0.19**	0.01***
1988†	na	na
Sex education		
Birth control	1.08	0.62*
AIDS	1.19	1.04
STD	0.69*	1.65*
Personal characteristics		
Black	0.71*	2.03
Age in years	0.85*	1.27**
Behind in school	0.81	0.91
Religiosity	1.91***	1.16
Region of residence		
North	0.85	1.07
Midwest	0.90	1.66**
West	1.04	1.29
South†	na	na
Family background		
Family structure growing up		
Mother only	0.79	0.69
Mother and other adult	0.54**	1.29
No mother present	0.53**	0.80
Mother and father†	na	na
Maternal education	0.92	0.92
Maternal education missing	1.19	1.56
Interactions		
1995 X religiosity	1.93***	3.76***
1979 X black	na	0.17**
Black X STD education	na	0.30*
<i>N</i>	2,051	2,045
<i>Model chi-square</i>	324.96	130.32
<i>df</i>	18	20

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$. †Reference category. Note: na=not applicable.

should be interpreted cautiously, but they suggest that AIDS education has contributed to safer behaviors, including reduction of sexual activity, among teenagers.

An increase in the average frequency of intercourse for the 1995 cohort compared with other cohorts remained significant even after we controlled for a variety of factors. This result is all the more striking since fewer teenage men were having sex in 1995 than in previous years. The analyses do not provide much insight about these opposing trends. Changes in attitudes or exposure to AIDS education may have delayed sexual activity for those who were already at relatively low risk, while increasing sexual activity among those who were at higher risk. Alternately, shifting attitudes or educational exposure may signal a trend toward stronger or steadier relationships, of which increased frequency of sexual activity may be a part. For example, the number of cohabiting couples under age 25 doubled from 1980 to 1996.¹⁸ In any case, if a smaller group of young men is engaging in more sex than before, then this group's potential exposures to HIV and other STDs and to pregnancy may have increased, even as the number of people at risk (i.e., those sexually active) has declined. On the other hand, NSAM data also reveal that use of condoms increased during the 1990s, which may mitigate the risks associated with higher levels of intercourse.¹⁹

The reasons for the attitudinal trends are somewhat enigmatic. Our study confirms prior research indicating that religiosity is associated with less-permissive sexual attitudes and behaviors.²⁰ This association became stronger in 1995 than in previous decades: An adolescent in 1995 who said that religion was very important to him had more conservative sexual attitudes than a teenager in 1988 with the same level of religiosity. In the 1990s, some religious beliefs may have become more strongly linked to conservative sexual values. For example, conservative Christian groups created the True Love Waits movement in the 1990s to encourage teenagers to pledge abstinence until marriage, and millions of teenagers are reported to have taken virginity pledges.²¹ Indeed, a recent study found that fundamentalist religious affiliation was more strongly related to a female remaining a virgin in 1988 than it was in 1982, indicating that during the 1980s the association of religion with sexual attitudes and

behavior grew increasingly important.²²

Although black teenagers' attitudes about premarital sex became more conservative between 1988 and 1995, their behaviors did not. Equally problematic, AIDS education is associated with reduced sexual activity for nonblack males, although this is not so for black males. The apparent resistance of black males' behaviors to risk-reducing attitudes or education is distressing, and suggests that researchers and educators have not fully understood the factors that motivate young black men.

Overall, a large share of the reduction in sexual activity over time, specifically among nonblack males, is related to a shift toward less permissive attitudes about sex and an increase in the prevalence of AIDS education during the 1990s. The reasons for the increase in the level of AIDS education are well-known: Public policies have promoted AIDS education in school to reduce the threat of the HIV epidemic.

This study demonstrates that religiosity is part of the reason for the shift in attitudes. However, other factors that might influence attitudinal changes could not be identified, suggesting that broader normative forces may play an important role in determining beliefs about sexual behavior. Growing public awareness of issues such as teenage pregnancy, child support, male responsibility and sexual harassment all may have been relevant. The questions for the future are how can we improve upon these changes, and, in particular, how can we promote safer behaviors among black youths?

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