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ARTICLE

Sexy Media Matter: Exposure to Sexual Content in Music, Movies, Television, and Magazines Predicts Black and White Adolescents' Sexual Behavior

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ABSTRACT

OBJECTIVE. To assess over time whether exposure to sexual content in 4 mass media (television, movies, music, and magazines) used by early adolescents predicts sexual behavior in middle adolescence.

METHODS. An in-home longitudinal survey of 1017 black and white adolescents from 14 middle schools in central North Carolina was conducted. Each teen was interviewed at baseline when he or she was 12 to 14 years old and again 2 years later using a computer-assisted self interview (audio computer-assisted self-interview) to ensure confidentiality. A new measure of each teen's sexual media diet (SMD) was constructed by weighting the frequency of use of 4 media by the frequency of sexual content in each television show, movie, music album, and magazine the teen used regularly.

RESULTS. White adolescents in the top quintile of sexual media diet when 12 to 14 years old were 2.2 times more likely to have had sexual intercourse when 14 to 16 years old than those who were in the lowest SMD quintile, even after a number of other relevant factors, including baseline sexual behavior, were introduced. The relationship was not statistically significant for black adolescents after controlling for other factors that were more predictive, including parental disapproval of teen sex and perceived permissive peer sexual norms.

CONCLUSIONS. Exposure to sexual content in music, movies, television, and magazines accelerates white adolescents' sexual activity and increases their risk of engaging in early sexual intercourse. Black teens appear more influenced by perceptions of their parents' expectations and their friends' sexual behavior than by what they see and hear in the media.

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Key Words
adolescents, mass media, sexual behavior, racial differences

Abbreviations
STI—sexually transmitted infection
SMD—sexual media diet
audio-CASI—audio computer-assisted self-interview
df—degrees of freedom
CI—confidence interval
RR—relative risk

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EARLY INITIATION OF sexual intercourse is a risk factor for teenage pregnancy and sexually transmitted infections (STIs).[1] Both male and female adolescents who are younger at first intercourse are less likely to use a contraceptive method.[2,3] Despite recent declines, the teenage pregnancy rate in the United States is still 3 to 10 times as high as those in other industrialized countries,[4,5] and 1 of every 2 sexually active youth acquires an STI by the time he or she is 25 years old.[6]

Some youth are more at risk for negative sexual outcomes than others. Young black men and women have the highest STI rates of any ethnic group in the nation, being 20 times more likely than whites to contract gonorrhea and 5 times more likely to have syphilis. Young black women are contracting AIDS faster than any other demographic group[7] and are disproportionately affected by teenage pregnancy.[8]

Although we might hope that parents and schools would be galvanized to action by such trends, studies show that parents rarely talk in a timely and comprehensive way with their children about sex, and schools are increasingly limited in what they can say, mandated by federal money to promote only abstinence until marriage and to discuss the failure rates of contraception.[9] In such a context of reticence by conventional sexual socialization agents, the mass media (eg, television, movies, music, and magazines) may be powerful sex educators, because they provide frequent and compelling portraits of sex as fun and risk free. The media may serve as a kind of sexual superpeer for teens, providing models of attractive older adolescents engaging in risky behavior that may not be condoned in the teen consumer's own peer group.[10–12]

Adolescents consistently cite the mass media as important sources of sexual information.[13] Recent surveys show that white adolescents in the United States spend on average 5 to 6 hours a day with some form of mass media and black youth spend even more.[14] The sexual content in much of the media these teens attend to is frequent, glamorized, and consequence free.[15] In 2002, >83% of the 20 television shows watched frequently by adolescents included sexual content, but only ~1 in 8 of those shows included any depiction of sexual risks and/or responsibilities.[16]

Despite long-standing concerns about the impact of increasingly explicit sexual content in mainstream youth media[17] and recent graphic examples, such as Janet Jackson's "wardrobe malfunction" at the 2004 Super Bowl game, relatively little research has looked at whether exposure to sex in the media has a long-term impact on teens' sexual behavior.[18] The few studies that have been conducted focused almost exclusively on television or some kinds of television programming, such as music videos, rather than other kinds of media, although television viewing accounts for only ~40% of early adolescents' (11–14 years old) media time.[14] In this longitudinal study, we investigated the effects of the sexual content in 4 kinds of media adolescents use frequently, television, music, movies, and magazines, on black and white adolescents' sexual behavior.

The few studies of the effects of television on adolescents' sexual beliefs have found that prime-time programs and music videos focusing on sex outside marriage promote more permissive attitudes about premarital sex.[19–22] Two cross-sectional surveys have linked frequent exposure to sexual television content and transition to sexual intercourse.[23,24] However, because time order was not clear in these studies, it is plausible to conclude that adolescents who were having sex were also those most interested in sexual content in the media rather than exposure to sexual media accelerated the adolescents' initiation of sexual activity. The single longitudinal study on this topic found that adolescents (12–17 years old) who watched television shows with more sexual content were more likely than those who saw fewer shows with sexual content to have engaged in more advanced sexual behavior, as well as sexual intercourse, up to 1 year later.[25] That study focused on only 25 television programs, however, combined younger and older adolescents in the same analyses, and paid relatively little attention to race differences.

In this study, we use a unique sexual media diet (SMD) measure that assesses the relative exposure to sexual content in 4 media (television, movies, magazines, and music) for each adolescent in the study sample. We also consider differences in patterns of media use and sexual behavior for both black and white youth and focus on early adolescents (12–14 years old) rather than a larger age range, because advanced sexual activity and transition to sexual intercourse before middle adolescence is most clearly linked to negative health outcomes.[1,26] Our central research question was: Are early adolescents who have heavier SMDs more likely than those with lighter SMDs to have more advanced precoital and coital behavior by middle adolescence?

METHODS

Sample and Procedures

The sample was drawn from 3 public school districts in the Southeastern United States that included urban, suburban, and rural populations. Fourteen of the 16 eligible middle schools agreed to participate; the 2 schools from 1 district that declined to participate had similar race and gender profiles as other schools in the district. In fall 2001, brief informational sessions inviting 7th and 8th graders to participate in a study of teens' media use and health behavior were held at each school. Eighty-one percent of enrolled students (n = 5029) provided useable contact information and were mailed a comprehensive media questionnaire and parent consent form, and 65% (n = 3261) returned the completed media survey

with signed parental consent. Race and gender characteristics of media survey respondents were similar to all of the enrolled students.

To assess sexual beliefs and behaviors at baseline, a subsample of 1200 adolescents who completed the media questionnaire were randomly selected from within 4 gender and race strata so that equal numbers of black and white males and females were included. In spring and summer 2002, 1074 (90%) of these adolescents were interviewed in their homes using the audio computer-assisted self-interview (audio-CASI) system. The audio-CASI allowed participants to answer questions by touching the screen on a laptop computer while hearing questions through headphones. The audio-CASI format has been shown to be especially effective when interviewing subjects about sensitive topics, such as sexuality and drug use.[27] A parent signed the consent form, and the adolescent signed an assent form guaranteeing confidentiality before each interview began.

Two years later, in spring 2004, 95% of the baseline sample (n = 1017) completed the follow-up in-home audio-CASI survey. Of the 57 respondents lost to follow-up, 6 were adolescent refusals, 7 were parent refusals, and the remaining 44 had moved out of the study area. There were no age, race, gender, or sexual behavior differences at baseline between respondents who completed the follow-up survey and those who did not. The sample for the present analyses includes the 1017 adolescents (262 black females, 264 black males, 243 white females, and 248 white males) who completed the media use questionnaire and both waves of the in-home survey.

Protocols and measures used in this study were reviewed and approved by the institutional review board of the university. Details about the recruitment protocol are described in more detail in L'Engle et al.[28]

Measures

SMD

Given that adolescents use a variety of media[14] and that sexual content varies both within and across media,[16,17,29] a rigorous assessment of an adolescent's exposure to sexual content in the media requires consideration of the frequency of using a variety of types of media and the sexual content contained in those varied media. Previous research[25,29] suggests that the sheer amount of sexual content is important rather than the specific type of sexual content, so the SMD measure was computed as the overall proportion of sexual content in the adolescents' media diet in 4 media over a 1-month period at baseline. The SMD measure is based on responses to the baseline media survey and subsequent analysis of the sexual content in the media most frequently used by the teens in this sample, and it accounts for the sexual content of each television show, music album, movie, and magazine used regularly by the adolescent, as well as the frequency of exposure to that content.

The media survey included questions about the frequency of using a variety of media, including television, movies viewed at home and in the theater, music, and magazines. In addition, respondents were provided with an extensive list of specific media offerings or "vehicles" for each of the 4 types of media and instructed to circle all they used regularly. The vehicle lists included specific television shows, movies, music artists, and magazines (eg, *The Simpsons*, *Titanic*, Ludacris, and *Sports Illustrated*) and were developed from published lists of media used by teens (eg, Nielsen reports and Billboard Top 100 Music Artists) that were then pilot tested with students living in the study area.

Based on results from the media survey, content analysis of 264 television shows, movies, music, and magazines that were attended to by ≥10% of any demographic subgroup (black and white females and males) was conducted. Vehicles were analyzed at the unit level for portrayals or references to pubertal development, romantic relationships, body exposure or nudity, sexual innuendo, touching and kissing, and sexual intercourse (Scott's π for intercoder reliability across all 4 media averaged 0.79). Because of differences in the duration of each vehicle and variation in the media formats, the unit of analysis was selected to be small enough to carry equal weight in each of the 4 media. Each paragraph, headline, and photograph in a magazine; each lyric line in a song; each nonbreak sequence (averaging 4.4 seconds) in a television show; and each nonbreak sequence (averaging 6.4 seconds) in a movie was treated as a unit. Approximately 28 000 sexual units (12%) of 236 000 total units were identified as containing sexual content. Additional details about the content analysis are provided elsewhere.[29]

We used 2 derived measures to compute the SMD score for each adolescent. First, we calculated the proportion of the adolescent's media use that is sexual by summing the total number of sexual content units across all of the vehicles used regularly by the respondent and then dividing by the total units (both sexual and nonsexual) in all of the vehicles attended to by that adolescent.

Second, we calculated the average frequency of using all 4 media by weighting the frequency of use for each individual medium. Television and music use were calculated by averaging responses to questions about use during the school week, on weekends during the school year, and during the summer; magazine use was assessed with 1 item; and movie viewing was assessed by averaging the frequency of viewing movies in the theater and the frequency of viewing movies at home. Because the average adolescent reported watching television on 30 days in a typical month, listening to music 30 days, reading magazines 4 days, and watching movies

2 days, weights of 0.45 each for television and music, 0.07 for magazines, and 0.03 for movies were used to compute the average frequency of using all 4 of the media.

The final SMD measure was computed by multiplying the proportion of sexual content across all of the vehicles the adolescent reported using by the average frequency of using all 4 of the media. Black adolescents had a higher SMD score than whites ($t = -11.3$; degrees of freedom [*df*] = 825; $P < .001$): the mean for black teens was 0.59 (SD: 0.12; range: 0.19–0.94), and for white teens the SMD mean was .48 (SD: 0.15; range 0.14–0.82). Because of the differences in SMD scores, the sample was split by race. Then, each racial group was divided into 5 equal-sized groups containing 20% of the sample (ie, quintiles) based on their SMD scores. The resulting race-specific 5-category measures are the main independent variables. Quintiles were used primarily to facilitate interpretation, because the SMD measure does not have a natural unit; the continuous SMD measure had such a large range (each respondent had a unique SMD score), and each SMD unit was very small and hard to interpret. Analyses were originally run with the continuous measure, and results are the same as when respondents are categorized into quintiles.

To illustrate how the SMD measure captures different media use patterns, we looked at the media used by white males in the highest and lowest SMD quintiles. White males in the highest quintile reported using all 4 of the media more frequently, and their media selections contained more sexual content, compared with their low SMD counterparts. For example, more than three quarters of the white males in the highest quintile listened to rap music, whereas only one third of the white males in the lowest SMD quintile did. Our content analyses showed that half of all the rap music listened to by the 7th and 8th graders in our sample contained sexual imagery. Similarly, the high-SMD white males were more likely to read men's magazines such as *Playboy* and *Maxim*, whereas those with a lower SMD were more likely to read less sexually oriented magazines such as *Newsweek* and *Gamepro*. For additional details about the construction of the original SMD measure, see Pardun et al.[29]

Precoital Sexual Behavior

To assess adolescents' precoital sexual behavior, a multiitem question was used. Female respondents were asked if they had ever engaged ("yes" or "no") in 5 sexual behaviors that included (1) "kissed a guy lightly on the lips," (2) "kissed a guy using your tongue," (3) "had my breasts touched by a guy," (4) "had my vagina touched by a guy," and (5) "had oral sex." Male response categories were equivalent but referred to relations with girls. The number of behaviors reported was summed to indicate level of precoital sexual behavior (Cronbach's α = .83 at follow-up), ranging from 0 to 5 with a mean of 2.8 and SD of 1.8 at follow-up. Table 1 shows the distribution of sexual behaviors across racial groups.

Age at First Sexual Intercourse

Respondents were asked: "Have you ever had sex?" Those who reported having engaged in sexual intercourse were assigned a value of "1," otherwise "0." By follow-up, 46% of black adolescents and 18% of white adolescents reported engaging in sexual intercourse. Teens who reported intercourse were also asked to report the specific month and year of first intercourse. Based on these responses, age at first sex was assessed as age in months at first intercourse; for the 67 respondents who reported their age at first sex but not the specific month and year, the reported age was converted to months.

Although we asked about sexual orientation, our sample was not large enough to fully analyze how these media effects may or may not occur for nonheterosexual young people. At follow-up, 51 teens (5.1% of the sample) self-identified as gay or bisexual, and 45 (4.5%) said they were "unsure" about their sexual feelings. For these teens, the sexual behavior questions were asked in a gender neutral way (eg, "guys and girls").

Control Variables

In addition to age, gender, race, socioeconomic status, parent education, and puberty status, a variety of other potential attitudinal and contextual determinants of adolescents' sexual behavior were used as covariates. Measures were based on standardized, validated instruments used with other samples of adolescents. All of the control variables were assessed at baseline. Table 2 presents the items and scale properties for these variables.

RESULTS

Figures 1 and 2 show the proportion of adolescents who reported engaging in sexual intercourse at each age for the lowest, middle, and highest SMD quintiles. Among white adolescents, there was a clear linear trend (Fig 1). White teenagers with higher SMD scores reported having sexual intercourse earlier than those with lower

TABLE 1 **Sexual Activity at Baseline and Follow-up**

Sexual Behaviors	Baseline (Mean Age: 13.6 y)		Follow-up (Mean Age: 15.6 y)	
	Black, *n* (%)	White, *n* (%)	Black, *n* (%)	White, *n* (%)
Light kissed	230 (44)	216 (44)	407 (77)	367 (75)
French kissed	188 (36)	141 (29)	358 (69)	303 (62)
Touched breasts	175 (33)	106 (22)	345 (66)	262 (54)
Touched genitals	125 (24)	56 (11)	280 (55)	191 (40)
Oral sex	43 (8)	23 (5)	142 (28)	130 (27)
Intercourse	109 (21)	20 (4)	239 (46)	88 (18)

TABLE 2 **Demographic Variables and Contextual Covariates**

Variable	Description	Range	Percent or Mean (SD)
Race	Race	0 = white, 1 = black	52% black
Age	Age at baseline	12.0–16.4 y	13.70 (.70)
Gender	Gender	0 = female, 1 = male	50% male
SES[41]	Received free or reduced-price breakfast or lunch at school	0 = high SES, 1 = low SES	32% low SES
Parent education	Father's or mother's level of education (whichever is higher)	1 = dropped out of high school to 5 = graduate degree	3.88 (1.34)
Puberty status	Comparison of pubertal development relative to peers	1 = much earlier to 5 = much later	3.0 (.94)
Relationship with mother	Quality of relationship with mother	1 = poor to 5 = excellent	4.18 (.99)
"Hands-on" parenting[42]	Number of activities performed by parents, such as setting a weekend curfew, eating dinner together, restricting CD purchases	1 = 1 activity to 8 = 8 activities	4.72 (1.66)
Perceived parental view of sex[43]	Perceived parental approval of adolescent having sex at this time in life	1 = strongly approve to 5 = strongly disapprove	4.59 (.76)
Religious attendance	Frequency of attending religious services	1 = never to 5 = 4 or more times/mo	3.66 (1.48)
Religious beliefs[44]	Agreement that religion is important	1 = strongly disagree to 5 = strongly agree	3.38 (.90)
School connectedness[43]	(*a*) Happiness at school; feeling teachers care; (*b*) trouble getting along with teachers; Cronbach's α for 3 items = .60	(A) 1 = not at all to 5 = extremely; (B) 1 = every day to 5 = never	3.87 (.61)
Grades	Grades received on most recent report card	1 = mostly Ds to 7 = mostly As	5.11 (1.61)
Perceived peer sexual norms[45]	Number of friends who have had sex	1 = none to 4 = most	1.96 (.98)

SES indicates socioeconomic status.

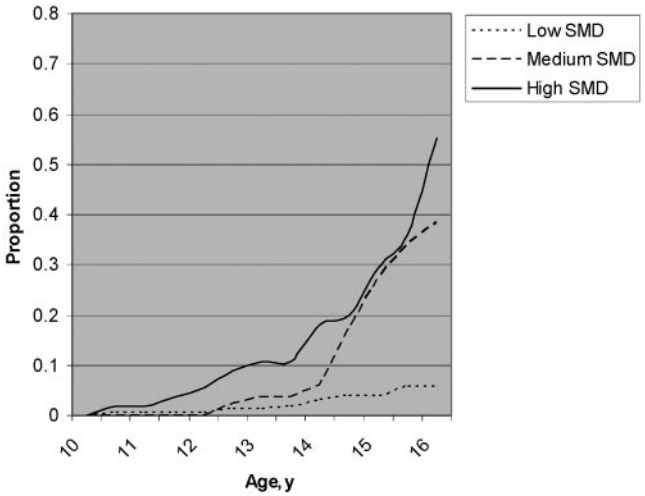

FIGURE 1
Proportion of white adolescents reporting sexual intercourse by age and SMD.

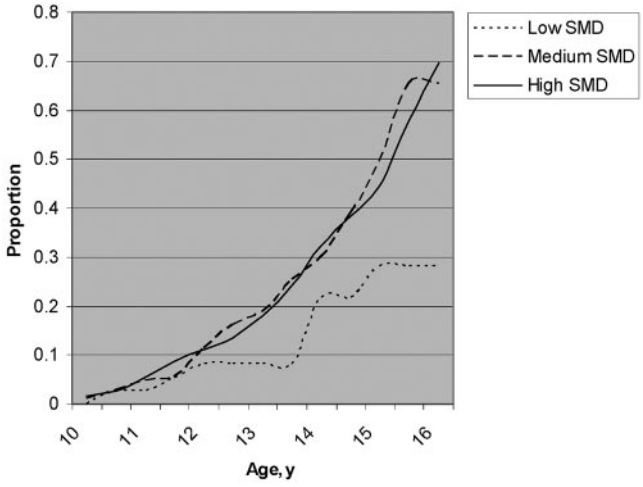

FIGURE 2
Proportion of black adolescents reporting sexual intercourse by age and SMD.

SMD scores. By 16 years of age, 55% of white teens in the highest SMD quintile had initiated intercourse, compared with 6% of white teens in the lowest SMD quintile.

The trend among black adolescents was not as clear (Fig 2). The lines indicating medium and high levels of SMD overlap across ages such that both groups seem to report similar proportions of group members who have had sexual intercourse. However, like white adolescents, black teens with the lowest SMD scores were much less likely than their black peers to have had intercourse. By 16 years of age, 66% to 70% of the black teens in the middle and highest SMD quintiles reported intercourse, compared with only 28% of black teens in the lowest quintile.

The complete set of bivariate relationships is shown in Table 3. A number of other demographic and contextual covariates, in addition to SMD, were related to follow-up sexual behavior.

Precoital Sexual Activity

Table 4 presents results from the ordinary least-squares regression analyses. For black and white adolescents, model 1 shows that baseline SMD significantly predicted follow-up precoital sexual behavior after controlling for

TABLE 3 **Bivariate Pearson Correlation Coefficients Among Demographic Characteristics, Covariates, Sexual Media Diet, and Sexual Behavior**

Baseline Demographic Characteristics	Sexual Media Diet at Baseline		Precoital Sexual Activity at Follow-up		Sexual Intercourse Status at Follow-up	
	Black	White	Black	White	Black	White
Age	0.17[c]	0.10[a]	0.20[c]	0.15[b]	0.26[c]	0.14[b]
Male	−0.32[c]	−0.45[c]	0.13[b]	−0.09	0.12[b]	−0.10[a]
Receives free lunch	0.18[c]	0.14[b]	0.10[b]	0.13[c]	0.13[b]	0.21[c]
Parent education	−0.15[b]	−0.31[c]	0.02	−0.18[c]	−0.11[a]	−0.24[c]
Early puberty	0.04	0.15[b]	0.22[c]	0.08	0.13[b]	0.06
Baseline covariates						
Good relationship with mother	−0.09[a]	−0.09	−0.10[a]	−0.18[c]	−0.12[b]	−0.18[c]
Hands-on parenting	−0.13[b]	−0.16[b]	−0.14[b]	−0.30[c]	−0.16[c]	−0.24[c]
Parent disapproval of teen sex	0.00	−0.06	−0.17[c]	−0.23[c]	−0.28[c]	−0.32[c]
High religiosity	0.01	0.18[c]	0.03	−0.03	−0.05	−0.02
Frequent religious attendance	−0.09[a]	−0.04	0.03	−0.03	−0.05	−0.03
School connectedness	−0.06	0.02	−0.11[a]	−0.13[b]	−0.09	−0.18[c]
Good grades	−0.11[a]	−0.16[b]	−0.08	−0.21[c]	−0.16[c]	−0.26[c]
Permissive peer sexual norms	0.18[c]	0.28[c]	0.35[c]	0.34[c]	0.40[c]	0.36[c]
Baseline sexual media diet	1.00	1.00	0.15[b]	0.38[c]	0.13[b]	0.30[c]
Sexual activity						
Baseline precoital sexual activity	0.19[c]	0.29[c]	0.57[c]	0.55[c]	0.47[c]	0.45[c]
Follow-up precoital sexual activity	0.15[b]	0.38[c]	1.00	1.00	0.54[c]	0.55[c]
Baseline sexual intercourse status	0.12[b]	0.11[a]	0.31[c]	0.21[c]	0.47[c]	0.40[c]
Follow-up sexual intercourse status	0.13[b]	0.30[c]	0.54[c]	0.55[c]	1.00	1.00
Minimum *n*	480	465	496	472	497	476

[a] $P < .05$.
[b] $P < .01$.
[c] $P < .001$.

demographic characteristics of respondents (for black adolescents: $F_{1,405}$ change = 11.9; $P < .01$; for white adolescents: $F_{1,407}$ change = 53.36; $P < .001$). Among black adolescents, being older ($B = .11$; $P = .026$), male ($B = .21$; $P < .001$), and experiencing early puberty ($B = .22$; $P < .001$) predicted increased levels of precoital sexual behavior. The only significant predictors of increased sexual behavior among white adolescents were

TABLE 4 **Standardized OLS Regression Coefficients Predicting Precoital Sexual Activity From Sexual Media Diet, Controlling for Baseline Sexual Behavior, Demographic Characteristics, and Other Covariates**

Demographic Characteristics	Black Teens			White Teens		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Age	0.11[a]	−0.01	0.00	0.10[a]	0.01	0.00
Male	0.21[c]	0.09	0.08	0.06	0.02	−0.03
Receives free lunch	0.08	0.08	0.09[a]	0.10[a]	0.06	0.04
Parent education	0.08	0.05	0.04	−0.02	−0.03	−0.02
Early puberty	0.22[c]	0.13[b]	0.13[b]	0.03	0.00	0.00
Baseline sexual behavior		0.53[c]	0.49[c]		0.47[c]	0.41[c]
Other covariates						
Good relationship with mother			−0.03			−0.05
Hands-on parenting			−0.03			−0.06
Parent disapproval of teen sex			−0.02			−0.13[b]
High religiosity			0.03			−0.11[a]
Frequent religious attendance			0.06			0.06
School connectedness			−0.04			0.04
Good grades			0.02			−0.08
Permissive peer sexual norms			0.07			0.04
SMD	0.18[b]	0.05	0.05	0.39[c]	0.25[c]	0.21[c]
Model R^2	0.13	0.36	0.39	0.19	0.38	0.42
SMD increment to R^2	0.03[b]	0.00	0.00	0.11[c]	0.04[c]	0.03[c]
N	411	411	380	413	413	393

Model 1 includes demographic characteristics and SMD; model 2 adds baseline sexual behavior; and model 3 adds other covariates.
[a] $P < .05$.
[b] $P < .01$.
[c] $P < .001$.

being older ($B = .10$; $P = .029$) and lower socioeconomic status ($B = .10$; $P = .039$).

When baseline precoital sexual behavior was added in model 2, the relationship between SMD and sexual behavior was reduced to nonsignificance for black adolescents ($F_{1,404}$ change = 1.37, P not significant). For white adolescents, SMD remained a significant predictor of follow-up precoital sexual behavior even after controlling for baseline precoital behavior ($F_{1,406}$ change = 26.58; $P < .001$).

In model 3, the attitudinal and contextual covariates were included. Among black adolescents, none of the covariates were significant predictors of precoital sexual behavior, and SMD remained unassociated with precoital behavior. Among white adolescents, perceived parent disapproval of sex ($B = -.13$; $P = .003$) and high religiosity ($B = -.11$; $P = .034$) were negatively associated with increased precoital sexual behavior. Baseline SMD continued to be a strong predictor of follow-up precoital sexual behavior among white teens, once all of the control variables were included in the regression model ($F_{1,378}$ change = 17.66; $P < .001$).

Age at First Sexual Intercourse

Table 5 provides results from Cox regression analyses predicting follow-up sexual intercourse from baseline SMD. As shown in model 1, increased SMD was predictive of increased risk of having sexual intercourse for both black and white adolescents, after controlling for demographic characteristics. The relative risk ratio for model 1 for black adolescents was 1.14 (95% confidence interval [CI]: 1.02–1.27; $P = .019$), indicating that a 1 quintile (20%) increase in SMD corresponded to a 14% greater risk of having sexual intercourse. The model 1 relative risk ratio for white adolescents was 1.50 (95% CI: 1.20–1.87; $P < .001$), indicating that a 1 quintile increase in SMD corresponded to a 50% increase in the risk of having sexual intercourse. Being male (RR: 1.58; 95% CI: 1.17–2.15; $P = .003$) and experiencing early pubertal onset (RR: 1.29; 95% CI: 1.11–1.49; $P = .001$) predicted increased risk of sexual intercourse for black teens, whereas lower socioeconomic status (RR: 2.36; 95% CI: 1.27–4.38; $P = .006$) was the only other predictor of sexual intercourse for white teens.

Attitudinal and contextual covariates were added in model 2. Among black adolescents, hands-on parenting (RR: 0.89; 95% CI: 0.80–0.98; $P = .019$) and perceived parent disapproval of teen sex (RR: 0.72; 95% CI: 0.06–0.87; $P < .001$) lowered the risk of having sexual intercourse, and perceptions of more permissive peer sexual behavior (RR: 1.50; 95% CI: 1.26–1.78; $P < .001$) increased the risk of sexual intercourse. Once covariates were added to the model, the relationship between SMD and sexual intercourse among black teens was reduced to nonsignificance (RR: 1.07; 95% CI: 0.95–1.21; P not significant). Among white adolescents, perceived parent disapproval of teen sex (RR: 0.49; 95% CI: 0.36–0.66; $P < .001$) and having good grades (RR: 0.82; 95% CI: 0.70–0.97; $P = .024$) predicted reduced risk of sexual intercourse, whereas perceptions of more permissive peer norms (RR: 1. 41; 95% CI: 1.01–1.97; $P < .046$) increased the risk of having sexual intercourse. Even after including the covariates in the model, baseline SMD predicted sexual intercourse for white adolescents (RR: 1.30; 95% CI: 1.04–1.63; $P = .021$), with model results indicating that a quintile increase in SMD in-

TABLE 5 Cox Regression Relative RRs (and CIs) Predicting Sexual Intercourse from SMD, Controlling for Demographic Characteristics and Other Covariates

Demographic Characteristics	Black Teens		White Teens	
	Model 1	Model 2	Model 1	Model 2
Male	1.58 (1.17–2.15)[b]	1.03 (0.70–1.52)	0.80 (0.47–1.37)	0.36 (0.20–0.65)[b]
Receives free lunch	1.28 (0.94–1.75)	1.14 (0.81–1.60)	2.36 (1.27–4.38)[b]	1.34 (0.66–2.72)
Parent education	0.97 (0.86–1.10)	0.95 (0.83–1.09)	0.86 (0.71–1.05)	0.86 (0.70–1.06)
Early puberty	1.29 (1.11–1.49)[b]	1.15 (0.99–1.34)	1.04 (0.80–1.34)	0.93 (0.70–1.24)
Good relationship with mother		0.93 (0.80–1.07)		0.98 (0.76–1.25)
Hands-on parenting		0.89 (0.80–0.98)[a]		0.90 (0.77–1.06)
Parent disapproval of teen sex		0.72 (0.59–0.87)[c]		0.49 (0.36–0.66)[c]
High religiosity		1.12 (0.84–1.50)		0.95 (0.69–1.31)
Frequent religious attendance		1.12 (0.98–1.29)		1.00 (0.82–1.22)
School connectedness		1.09 (0.83–1.43)		0.70 (0.46–1.06)
Good grades		1.01 (0.91–1.12)		0.82 (0.70–0.97)[a]
Permissive peer sexual norms		1.50 (1.26–1.78)[c]		1.41 (1.01–1.97)[a]
SMD	1.14 (1.02–1.27)[b]	1.07 (0.95–1.21)	1.50 (1.20–1.87)[c]	1.30 (1.04–1.63)[a]
N	405	375	419	399

Model 1 includes demographic characteristics and SMD, and model 2 adds other covariates.

[a] $P < .05$.

[b] $P < .01$.

[c] $P < .001$.

creased the risk of having sexual intercourse by 30%. Therefore, white adolescents who were in the top exposure quintile to sexual content in the media were at 120% greater risk, or 2.2 times as likely, to have initiated sexual intercourse than white adolescents who were in the lowest exposure quintile.

To assess model fit, likelihood ratio tests were performed comparing models in which SMD was present to those in which it was absent. The addition of SMD to the model significantly improved the fit for white teens ($\chi^2 = 4.72$; $df = 1$; $P = .030$) but not for black teens ($\chi^2 = 3.04$; $df = 1$; $P = .081$).

Comment

According to these data, 12- to 14-year-olds who have heavier SMDs are more likely than those with lighter SMDs to have engaged in sexual activity 2 years later. This pattern holds most clearly for white teens even after a number of other factors known to increase the likelihood of teen sexual activity have been taken into account.

This study affirms and extends the 1 previous prospective study that found that earlier exposure to sexual content on television predicted adolescents' sexual behavior 1 year later.[25] The more comprehensive measure of early teens' exposure to sexual content in 4 media used in this study suggests that it is not only television but other media, such as music, movies, and magazines, that also push adolescents toward sexual activity. The effect sizes found here were small for blacks ($r = 0.15$ for precoital behavior and $r = 0.13$ for sexual intercourse) and medium for whites ($r = 0.38$ for precoital behavior and $r = 0.30$ for sexual intercourse), according to Cohen's standards.[30] The effect size for whites, however, is equivalent to what Bushman and Anderson[31] found in their meta-analysis of the effects of violence on television on aggressive behavior.

Many factors other than the media affect adolescents' sexual behavior. We included several that were predictive in previous studies to account for the possibility that the relationship between SMD and teens' sexual behavior could be because of some third factor and/or help explain the relationship. Interestingly, one of the strongest predictors of risk for early sexual intercourse for both black and white teens was the perception that his or her peers were having sex. Such perceptions may also be influenced by the kind of media the teen attends to. Previous research on the effects of the media suggests that because media portrayals of sexuality tend to be so consistent, frequent media users may begin to believe the world view portrayed and may begin to adopt the media's social norms as their own.[32,33] Some, especially those who have fewer alternative sources of sexual norms, such as parents or friends, may use the media as a kind of sexual superpeer that encourages them to be sexually active.[12]

One of the strongest protective factors against early sexual behavior was clear parental communication about sex. White teens who reported that their parents did not approve of them having sex at this age were less likely to have engaged in precoital behavior. Both black and white youth were less likely to have engaged in sexual intercourse by the time they were 16 years old than those who perceived less parent disapproval of teen sex.

The lack of relationship between SMD and sexual behavior after controlling for other possible factors for black teens was not expected, especially given the consistent finding that black teens spend more time on average using media than white teens.[14] Because baseline sexual behavior was the strongest predictor of subsequent precoital behavior, it may be that by early adolescence black youth have already formed their expectations about sexual behavior and have begun acting on them. As has been found in other studies,[1,34] black youth in this sample were more sexually experienced than whites, so if we had assessed their patterns of media use and sexual behavior earlier, exposure to sexual content in the media may have shown a stronger relationship with sexual behavior. Little is known about why race differences in sexual behavior exist. A few ethnographic studies suggest that peer group norms are especially powerful for urban black males who are encouraged to achieve status by having as many sexual partners as possible.[35] By early adolescence, real peer groups that promote early and frequent sexual behavior may take precedence over other socialization factors, such as the virtual peers presented in the media. It could also be that the norms of the peer groups have already been influenced by the media, and, thus, the media effect, although indirect, is still powerful. Longitudinal studies that begin with younger adolescents and include more waves of data would be helpful in identifying such potential pathways of media influence.

Limitations

This study is limited in several ways. These findings are not based on a nationally representative sample, so it may be that adolescents living in other parts of the country attend to a different pattern of media and are affected differently by the media diet they choose. The sample analyzed here, however, includes a diverse mix of youth living in rural, suburban, and urban communities and includes an unusually large portion of youth from lower socioeconomic families. The relatively large sample of black youth is unusual for a study of this kind.

It is also possible that some bias may have been introduced, because the sample was drawn from public middle schools rather than all adolescents in the region. Students in the same school may be more similar with respect to outcome variables than students in other schools. This lack of within-group variance would down-

wardly bias estimates of standard errors. School-level effects are probably minimal, however, because the 14 participating schools comprised 3 school districts that are geographically adjacent, and statistical controls for race, gender, and socioeconomic status are known to reduce the impact of school effects.

All of the possible alternative explanations for early sexual behavior were not included in this analysis. We were not able, for example, to include measures of exposure to adverse events in early childhood that have been found to predict subsequent harmful health behaviors, including early sexual behavior.[36] Pubertal status may play an important role in both selection of sexual media content and sexual behavior. Although pubertal status was included as a control variable, the measure used here was a self-report of physical development relative to age mates. Unfortunately, it is difficult to accurately and easily assess pubertal development, especially for males. It will be important in future research to begin with a younger sample to increase the likelihood of pubertal variation and to include more sensitive measures of pubertal development.

Furthermore, we did not analyze the Internet as a potential source of sexual information, because relatively few of the early adolescents in our sample had ready access to the Internet when the initial survey was conducted (fall 2001). Exposure to more explicit sexual material, now increasingly available on the Internet, also was not assessed. Additional research on the effects of the media on adolescent sexuality should include exposure to Internet pornography.

Our argument for using the SMD measure that combines exposure across 4 media is that adolescents sample content across a variety of media and that exposure to the whole array is more important than exposure to any 1 medium. However, the combined SMD measure obscures the effects of the individual media that make up the diet. Subsequent analyses should look more closely to determine the relative influence of each of the component media on adolescents' sexual behavior. This could help in thinking about clinical and policy implications, because it may be more feasible to focus on 1 or 2 kinds of media rather than the whole array.

Implications

Clearly more research is needed to fully understand the relationship between exposure to sexual media content and adolescents' sexual behavior. This is one of the first studies to establish the basic connection. It took many studies over a number of years to establish that violence in the media increased children's violent behavior and to begin initiatives to reduce harmful effects.[31] Given the consistent findings regarding media violence, it may be prudent not to wait decades to conclude that the media are also important sources of sexual norms for youth.

A number of opportunities and strategies, including media literacy education for parents and youth, partnerships with youth-oriented media,[37] and physician education and intervention,[38] exist that might help reduce the negative effects of the media on youth and perhaps enhance the positive. The American Academy of Pediatrics and other medical organizations have already been powerful voices in the effort to improve media content and educate parents and physicians about the potentially harmful effects of the mass media.[18,39,40] Such efforts should be continued in the interest of healthier SMDs and healthier sexual lives for young people.

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