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Social Cognitive Processes Mediating the Relationship Between Exposure to Television's Sexual Content and Adolescents' Sexual Behavior

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This study used multiple-group structural equation modeling to test a model explaining the association between exposure to televised sexual content and initiation of intercourse among an ethnically diverse national sample of 1,292 adolescents. The authors hypothesized, on the basis of social-cognitive theory, that exposure to televised sexual content would influence adolescents' safe-sex self-efficacy, sex-related outcome expectancies, and perceived peer norms regarding sex, and that each of these would, in turn, influence intercourse initiation. Findings support a model in which the relationship between exposure to TV's sexual content and intercourse initiation is mediated by safe-sex self-efficacy among African Americans and Whites but not among Hispanics. Outcome expectancies and perceived peer norms may also mediate the link between exposure and intercourse initiation among all 3 racial/ethnic groups, although evidence of this could not be confirmed.

Keywords: adolescent sexual behavior, intercourse initiation, social cognitive theory, television

By the time they have graduated high school nearly two thirds of young people in the United States will have had sexual intercourse (Centers for Disease Control & Prevention, 2002). Although intercourse is common among youth and represents a key transition point in sexual development (Delamater, 1981), most sexually active teens wish they had waited longer to have sex (National Campaign to Prevent Teen Pregnancy, 2002), suggesting that youth are having sex before they are prepared for its consequences. Compared with those who postpone sexual activity until later, individuals who initiate sexual activity in adolescence have an increased risk of acquiring a sexually transmitted disease (STD) and having an unplanned pregnancy (Brown & Eisenberg, 1995; Koyle, Jensen, & Olsen, 1989). Of the 18.9 million new cases of STDs that occurred in the U.S. in 2000, almost half (9.1 million) were among persons aged 15 to 24 (Weinstock, Berman, & Cates, 2004). Thus, early sexual initiation is an important health issue.

One contributor to early sexual activity may be exposure to the media, particularly TV (Collins et al., 2004). Primetime network portrayals of sexual content average 10 per hour (Lowry & Shindler, 1993). Moreover, the primetime shows that are most popular with teens are full of sexual messages, with sexual talk or behavior

occurring in eight of every 10 episodes (Kunkel et al., 2003). Sexual content on network TV is not as explicit as sexual content in music videos or movies (Greenberg, 1994), and typically is confined to talk about sex, physical flirting, passionate kissing, and intimate touching (Kunkel et al., 2003). However, considering that adolescents spend on average 3 to 4 hours a day watching TV (Roberts, 2000), its potential influence is enormous. Recently, using results of a national longitudinal survey of adolescents, we demonstrated that adolescents who viewed more sexual content at baseline were more likely to initiate intercourse and progress to higher levels of noncoital sexual activity over the subsequent year, even after controlling for a broad set of respondent characteristics that might otherwise explain these relationships (Collins et al., 2004; see also Brown & Newcomer, 1991; Peterson, Moore, & Furstenberg, 1991). However, the psychological processes through which exposure to sexual content on TV influences adolescents' sexual experiences were not established in that study. Building on prior research on media violence and aggressive behavior, the present analysis of data from the same cohort tests the utility of a social-cognitive framework for explaining the link between exposure to televised sexual content and adolescent sexual behavior.

Social-cognitive theory (SCT; Bandura, 1977, 1986; Bushman & Huesmann, 2001; Huesmann, 1998) contends that people observe important role models, make inferences and attributions, and acquire scripts, schemas, and normative beliefs that then guide their subsequent behavior. This theoretical perspective would predict that adolescents learn sexual behaviors and their likely consequences by watching TV. To the extent that adolescents acquire favorable beliefs about sex and confidence in their own sexual

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abilities as a result of viewing sexual content on TV, they become more likely to attempt the modeled behaviors.

Although data on the relationship between media exposure and sexual behavior is just beginning to accumulate, a great deal of evidence supports the notion that aggressive behavior is learned through exposure to media, particularly TV (see Bushman & Anderson, 2001, and Paik & Comstock, 1994, for reviews of this literature). In correlational studies, adolescents who watch more TV violence report more aggressive behaviors. This relationship has been observed as long as 15 years later, and remains even after controlling for a myriad of third variables as well as for prior aggressive behavior (Huesmann, Moise-Titus, Podolski, & Eron, 2003). Some of the strongest evidence supporting the social learning of violence through media comes from controlled experiments. Beginning with Bandura and Walters' (1963) demonstration that children who see a film of an adult hitting an inflated "Bobo" doll are as likely to imitate this behavior as children who witness the same type of aggression in person, such studies have repeatedly demonstrated that rewarded violence or violence that is not clearly punished encourages the learning of aggressive attitudes and behaviors (see Hearold, 1986, for a review).

Although this literature suggests that media exposure to a behavior increases the likelihood of engaging in that behavior through a process of learning and imitation, it is not conclusive regarding the processes responsible for the link between adolescent sexual behavior and exposure to TV's sexual content. In contrast to violent and aggressive behavior, sex is not directly observable in most network TV portrayals. It is typically discussed or implied, rather than shown (Greenberg, Linsangan, & Soderman, 1993). Although social models are thought to influence attitudes and behavior through the views they express as well as through their actions (Bandura, 1977), little research has demonstrated this type of influence.

Three key social-cognitive variables that may mediate the association between exposure to TV's sexual content and adolescent sexual behavior are perceived norms about sex, sexual self-efficacy, and sex-related outcome expectancies. Studies have consistently demonstrated that adolescents' perceptions about their friends' sex-related beliefs and behaviors predict their own future sexual behaviors (Bachanas et al., 2002; Billy & Udry, 1985; Carvajal et al., 1999; Kinsman, Romer, Furstenberg, & Schwarz, 1998; Newcomb, Huba, & Bentler, 1986; Santelli et al., 2004). In general, these studies show that perceived prosex norms are positively related to adolescents' future sexual behaviors. For example, in a prospective study of early adolescents, Kinsman and colleagues (1998) found that youth who perceived a higher prevalence of sexual initiation among their peers were more likely to initiate sexual intercourse over the subsequent year.

Perceived self-efficacy, defined as a judgment of one's ability to perform given types of behavior (Bandura, 1977), has been shown to influence the behaviors individuals choose to enact and how much effort they direct toward executing those behaviors (Bandura, 1997). We know of no studies that have tested associations between sex self-efficacy and sexual behavior. However, several studies have shown that the narrower construct, safe-sex self-efficacy, is an important predictor of adolescents' sexual behavior (e.g., Dilorio et al., 2000; Rosenthal, Moore, & Flynn, 1991; Taris & Semin, 1998). For example, Taris and Semin (1998) used data from a two-wave panel study to demonstrate that safe-sex self-

efficacy, defined as the degree to which adolescents feel able to discuss sexually sensitive topics with a potential partner, was associated with increased levels of sexual experience among adolescents aged 15 to 18 years old.

The link between outcome expectancies—that is, beliefs about the potential consequences of one's behavior (Bandura, 1977, 1986) – and adolescent sexual behavior is less clearly established. Some studies have demonstrated a strong association (Dilorio et al., 2001; Gilbert, Bauman, & Udry, 1986; Kinsman et al., 1998). For example, Kinsman et al., (1998) found that youth who perceived social benefits associated with early sexual intercourse were more likely to subsequently initiate sexual intercourse than youth who did not perceive such benefits. Other studies, however, have shown either a weak association (e.g., Lavery, Siegel, Cousins, & Rubovits, 1993) or no association (Cohen & Fromme, 2002; Katz, Fromme, & D'Amico, 2000).

In summary, there is evidence that these key constructs from social-cognitive theory predict adolescent sexual initiation, though not all of this evidence is strong. This suggests that these beliefs may mediate the association between viewing sexual content and sexual behavior change. For this to be the case, however, these beliefs must also be associated with exposure to sexual content on TV. Previous work has demonstrated such associations. Attitudes toward sex (Strouse & Buerkel-Rothfuss, 1993) and sexual expectations (Aubrey, Harrison, Kramer, & Yellin, 2003), as well as a wide range of perceptions regarding normative sexual behavior (Buerkel-Rothfuss & Strouse, 1993) have been examined. For example, Aubrey and her colleagues (2003) found that exposure to sexually oriented TV was related to an expectation of a variety of sexual activities in relationships for college men and to an expectation of earlier sex in relationships for college women. Recent research has also shown that teens who are more involved with TV media have greater sexual self-confidence compared to teens who are less involved (Brown, Mebane, & Lengle, 2004). Although provocative, these studies do not demonstrate mediation, that the effect of exposure to TV's sexual content on teen sexual behavior is driven by changes in adolescents' knowledge and beliefs, nor do they specify which cognitions are most central to these changes. Without a clear understanding of the process by which exposure to televised sexual content affects adolescents' sexual behavior, efforts to intervene will be ineffective and perhaps even counterproductive.

Current Study

In the present study, we used structural equation modeling (SEM) to test a theoretical model explaining the longitudinal relationship between exposure to sexual content on TV and the initiation of intercourse among an ethnically diverse national sample of 1,292 adolescent girls and boys. Our study combined interview data with state-of-the-art analyses of TV sexual content to develop measures of exposure to sexual content on TV that included measures of exposure to talk about sex and sexual behavior. Our model, based on social-cognitive theory, proposes that perceived sexual norms, self-efficacy regarding sex-related behaviors, and outcome expectancies mediate the relationship between exposure to TV's sexual content and the initiation of intercourse. Although SCT hypothesizes knowledge as a mediator of the relationship between TV exposure and behavior, network TV rarely

conveys the kinds of facts about sex that are measured by validated instruments (e.g., National Institute of Mental Health [NIMH] Multisite HIV Prevention Trial Group, 2001), and so we did not include knowledge as part of our model.

In this study, perceived sexual norms reflected participants' beliefs about their friends' sexual activity. According to both cultivation theory (Gerbner, Gross, Morgan, & Signorielli, 1986) (a theory specific to media effects) and social-cognitive theory, TV conveys information about the importance and acceptability of sexual behavior, and influences people's perception of the likelihood that any given person is sexually active. TV has been shown to affect these broader normative perceptions about sex (e.g., Buerkel-Rothfuss & Strouse, 1993), and by extension is likely to influence adolescents' perceptions of their friends' behavior. We focused on friend norms because they are among the most influential social models during adolescence. We hypothesized that greater exposure to televised sexual content would lead to increased estimates of the percentage of one's friends who are sexually active.

The general concept of sexual self-efficacy reflects participants' confidence in their ability to enact behaviors related to sex. However, a relationship between this broad construct and sexual behavior has not been demonstrated. Given prior work indicating a relationship between safe-sex self-efficacy and sexual initiation, and under the assumption that safe-sex self-efficacy should be highly related to the broader concept of sexual self-efficacy, we used a measure of safe-sex self-efficacy to test our prediction. We hypothesized that greater exposure to TV's sexual content would predict higher scores on this measure.

Outcome expectancies were defined in our research as beliefs about the potential negative consequences of sexual activity. Based

on prior studies demonstrating links between media exposure and beliefs about sex (e.g., Aubrey et al., 2003) and the predictions of SCT, we hypothesized that greater exposure to sexual content on TV would lead to less negative expectancies regarding the consequences of sexual intercourse. Each of these proposed mediators—prosex norms, increased safe-sex self-efficacy, and decreased negative outcome expectancies regarding sex—were in turn expected to predict an increased likelihood of first intercourse in the subsequent year.

Figure 1 depicts these hypothesized relationships. Exposure to TV's sexual content was measured at baseline and captured participants' viewing habits over the six months just prior to the baseline survey. The hypothesized mediating variables were also measured at baseline and reflected participants' standing on these variables at the time of the baseline survey. We controlled for prior sexual experience by including only those who were virgins at baseline (73% of the total longitudinal sample) in our analyses.

We conducted exploratory tests of differences in the process depicted in this model by gender and race/ethnicity. Some studies have shown differences in interpretation of TV for these subgroups, suggesting that there might be differences in the way they respond to exposure to TV's sexual content (Aubrey et al., 2003). For example, some have argued that TV should have a greater influence on the sexual behavior of boys because they receive less information about sex from parents than girls receive (Nolin & Peterson, 1992). In their study of the effects of media on sexual behavior, Peterson and colleagues (1991) found large differences between the sexes, and conjectured that TV may have a stronger effect on boys' behavior because precocious sexual behavior among boys is more socially acceptable and because the negative outcomes of precocious sexual activity (e.g., unintended preg-

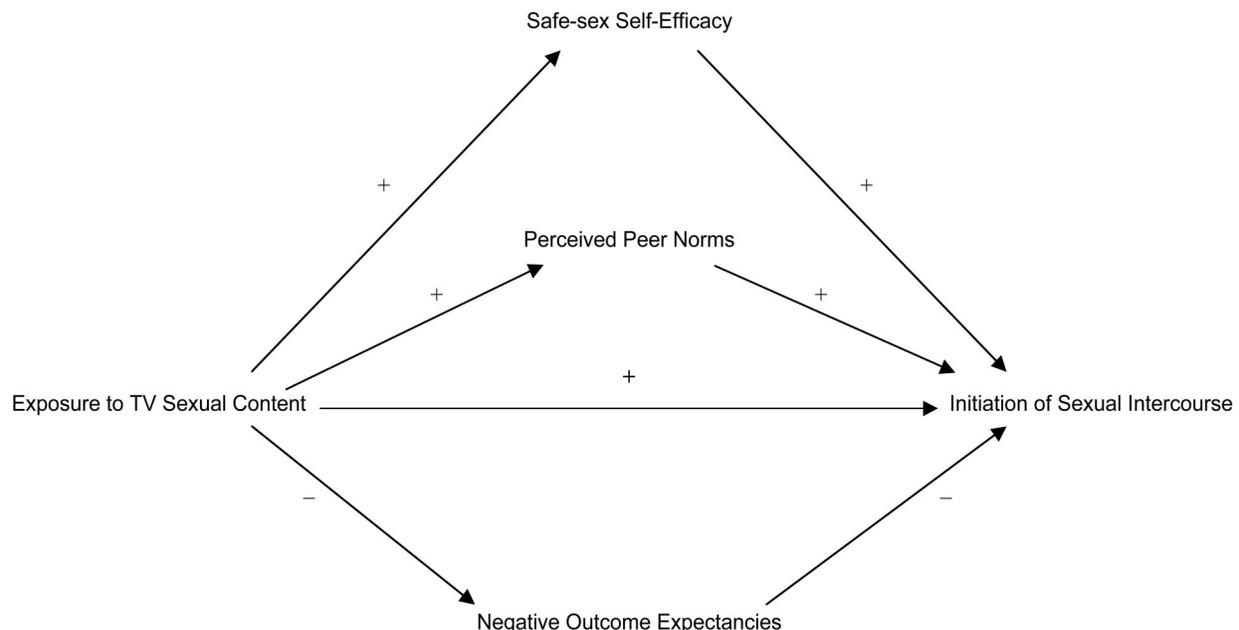


Figure 1. Proposed model: The effect of exposure to TV's sexual content on initiation of intercourse as mediated by social-cognitive factors. Although not shown in the figure, our model included correlations between all pairs of potential mediating variables.

nancy) are more severe for girls than they are for boys. Moreover, some research has shown that in general TV portrayals of women's sexuality differ from portrayals of men's sexuality. For example, Ward (1995) found that portrayals of women's sexuality tend to focus on women's ability to find the "right" man and their success in restricting sexual activities until they obtain sufficient emotional commitment. Portrayals of men's sexuality, on the other hand, tend to focus on men as initiators and aggressors in sexual relationships.

Adolescents with different racial and ethnic backgrounds may also respond differently to TV's sexual content. African American youth differ from Whites in their TV viewing habits (Brown, Childers, & Waszak, 1990) as well as their reactions to sex-related media content (Walsh-Childers & Brown, 1993). For example, one study found that viewing traditionally female-oriented TV fosters the acceptance of stereotypes of heterosexual relationships and male dominance among African American adolescents, but not among Whites (Walsh-Childers & Brown, 1993). Also, whereas African American and white youth are equally likely to identify with white TV characters, African Americans are far more likely than Whites to identify with African American characters and view characters of both races as more realistic than do Whites (Greenberg & Atkin, 1982). Finally, Collins et al., (2004), using the same data set examined here, found that African American adolescents were more strongly influenced by some kinds of sexual portrayals than other racial groups.

In our analyses, we controlled for variables that are associated with the sexual behavior of adolescents. These include age, school grades, and several family factors. According to the most recent Youth Risk Behavior Survey, 61% of 12th grade students have had sexual intercourse, compared with 39% of 9th grade students (Centers for Disease Control & Prevention, 2002). Lower educational goals and achievement are associated with earlier initiation of sexual intercourse (Schvaneveldt, Miller, Berry, & Lee, 2001), as are low maternal education, absence of parental supervision, and an unstable family environment (Borawski, Ievers-Landis, Lovegreen, & Trapl, 2003; Hogan & Kitagawa, 1985; Kahn, Hofferth, & Kalsbeek, 1988; Miller & Moore, 1990). We also assessed a number of personal characteristics that are known correlates of adolescent sexual behavior, and likely also to predict viewing of sexual content. These included mental health, self-esteem, religiosity, deviance, and sensation seeking. Finally, we included in our model a measure of total TV viewing, which may be a reflection of the lifestyle of adolescents and how they budget their time (Strickland, 1983). The measure of total TV viewing also served as an important control for the fact that those who watch more sexual content on TV watch more TV in general. When testing the effects of specific content without such a control, the effects of total viewing are picked up by the content variable and tend to dominate, rendering interpretation of any relationships ambiguous (Collins et al., 2004; Brown & Newcomer, 1991).

Method

Sample Recruitment and Characteristics

Our sample for this study was recruited from a purchased list of households with a high probability of containing a member age 12–17. The sample frame was stratified by census tract race/ethnicity to produce nationally representative proportions of minority and non-Hispanic white youth. We mailed parents in these households an explanation of the study

in advance, and obtained verbal consent via telephone from a parent or legal guardian just prior to conducting an interview with a randomly selected teen from the household. Teens provided verbal assent. Our refusal rate at baseline was 36%, similar to other studies of less sensitive topics. The vast majority of those adults who refused consent cited time constraints rather than a concern with the sexual content of the survey. The baseline sample of 2,003 teens was similar to the U.S. population of youth, based on a comparison of many sample characteristics with the 1999 Current Population Survey. We used information provided by the supplier of our sample and a brief nonresponse interview with refusing adults to model nonresponse in all eligible cases. There was a very slightly higher response rate in households in which a teen aged 12 to 14 was present but not randomly selected for interview, and a lower response rate in households in which a boy over age 14 was randomly selected to participate.

To be eligible for inclusion in the current analyses, participants must have reported no lifetime experience with penile-vaginal intercourse at baseline ($N = 1,522$). Characteristics of the eligible baseline sample are presented in Table 1. Eight-five percent of this sample ($N = 1,292$) also completed an interview at follow-up. We used logistic regression analysis to examine 32 baseline variables as predictors of attrition, and found no significant relationships. These baseline variables included demographic factors, sexual attitudes, and sexual behaviors. As can be seen in Table 1, the subsample of respondents to the follow-up survey was nearly identical to the full baseline sample of virgins.

Procedure

The baseline and follow-up interviews were conducted one year apart by trained staff. Both surveys were approximately 35–40 minutes in length, and focused on exposure to televised sexual content, intercourse-related outcome expectancies, perceived norms regarding sex, and sexual behavior and intentions, consistent with social learning theories.

Measures

Outcome variable: Initiation of intercourse. Intercourse experience at follow-up was measured with the item "Have you ever had sex with a boy/girl? By sex we mean when a boy puts his penis in a girl's vagina (0 = no, 1 = yes)."

Exposure to sexual content on TV. At baseline, participants reported how often they watched each of 23 TV programs during the prior TV season ("since school started last fall") on a four-point scale ranging from "never" to "every time it's on." We chose programs that were popular with adolescents aged 12–17 at the time of the survey and that contained high levels of sexual content (e.g., "Friends," "Dawson's Creek" and "Sex and the City"). The full set of programs included ones appearing on broadcast

Table 1
Sample Characteristics

Group	Baseline % (n)	Follow-up % (n)
Male	50.5 (768)	48.8 (632)
Female	49.5 (754)	51.2 (660)
White	78.2 (1,190)	79.4 (1,027)
African American	9.6 (146)	9.2 (119)
Hispanic	7.8 (119)	6.9 (88)
Other	4.4 (67)	4.5 (58) ^a
12–14 years at baseline	45.7 (696)	45.8 (592)
15–17 years at baseline	54.3 (826)	54.2 (700)

^a The breakdown for this category is as follows: Asian/Pacific Islander (1.6% of eligible follow-up sample), American Indian/Alaskan Native (0.7% of eligible follow-up sample), mixed race 0.7% of eligible follow-up sample, and undesignated (1.5% of eligible follow-up sample).

networks and basic and premium cable channels and encompassed animated and live action shows, reality shows, sitcoms, and dramas. We created a measure of exposure to TV's sexual content by linking information from our survey to information about the sexual content of the programs. Content information was obtained from ongoing research by Kunkel and his colleagues (Kunkel et al., 2003). Kunkel's TV content analysis representatively samples hundreds of programs from 10 of the most frequently watched channels, representing all segments of the TV industry. Kunkel sampled two to more than a dozen episodes for each program covered in our survey. Coders parsed the episodes into distinct scenes and coded the presence of any sexual behavior (physical flirting, passionate kissing, intimate touching, implied intercourse, depicted intercourse), sexual talk (about own/others' plans or desires, about sex that had occurred, talk toward sex, expert advice, and other), and talk or behavior depicting risks or the need for safety in regard to sexual activity.¹ Raters coded the degree of focus (major or minor) on sexual behavior, talk, or sexual risks in each scene. High levels of agreement (reliabilities ranged from 89–100%) were observed among the coders. For each TV program studied, the amount of sexual content was calculated as the average number of scenes per episode containing a major focus on sexual behavior, plus the average number of scenes containing a major focus on talk about sex. We derived the exposure measure by multiplying the indicators of the amount of sexual content in each program covered in our survey by self-reported viewing of each program, and summing across programs. This measure of exposure has been shown to reliably predict intercourse initiation and other sexual activity among adolescents (Collins et al., 2004).

Social-cognitive variables. Four items measured expected negative consequences of having sex. Consistent with recent recommendations by Aubrey (2004), these included emotional (e.g., "If you had sex, you would feel guilty afterward"), social (e.g., "If you had sex, you would get a bad reputation"), and health consequences (e.g., "People who have sex will probably get a sexually transmitted disease"). Participants used 4- and 5-point scales, with endpoints of *strongly agree* and *strongly disagree*, to indicate their (dis)agreement with each item. Outcome expectancy items were recoded when necessary so that higher scores indicate more negative expectancies. We measured perceived norms with a single item. Males were asked how many of their male friends have had sexual intercourse (1 = *none* to 5 = *all*), and females were asked how many of their female friends have had sexual intercourse (1 = *none* to 5 = *all*). Three items measured safe-sex self-efficacy: "How likely is it that you would be able to get condoms if you want them," "How likely is it that you would be able to talk with a boy (if female respondent) or girl (if male respondent) about whether or not you should have sex," and "If you had sexual intercourse, how likely is it that you would be able to use a condom every time?" These self-efficacy questions were measured on a 4-point scale with *not at all likely* [1] and *very likely* [4] as the endpoints.

Demographic and control variables. Demographic variables included participants' age at baseline (in years), gender (0 = *male*, 1 = *female*), race/ethnicity (dummy coded as white vs. African American, Hispanic, and Other), family structure (0 = *nonintact family*, 1 = *intact two-parent family*), and the highest level of education attained by either of the participants' parents (1 = *less than high school*, 6 = *completed graduate or professional degree*). Parental monitoring was measured with a 5-item scale (e.g., "When you are away from home, your parents know where you are and who you are with"; items rated from 1 = *strongly agree* to 5 = *strongly disagree*) developed to predict adolescent risk behavior (Kosterman, Hawkins, Guo, Catalano, & Abbott, 2000; $\alpha = .70$ in this sample). A single item measured whether a participant's close friends were mainly younger, older, or about the same age, and was dichotomized to indicate "older" versus all other responses. Respondents' self-reported grades in school at baseline were used as an indicator of academic performance (1 = *mostly A's* to 5 = *mostly F's*). Mental health ($\alpha = .68$) was assessed with the MHI-5, a well-validated five-item scale tapping affective state over the prior 4 weeks (Ware & Sherbourne, 1992). Self-esteem was measured with

three items from the Rosenberg Self-Esteem Inventory ($\alpha = .72$; Rosenberg, 1965). To measure religiosity, we asked participants to indicate on a 4-point scale their agreement with the statement, "Religion is very important in my life." Deviant behavior was measured with six items drawn from prior studies of adolescent risk behavior ($\alpha = .65$; Collins, Ellickson, & Bell, 1998). Participants indicated how many times in the past 12 months they had: been sent out of class, broke into a house, school, or place of business, skipped school, cheated on a test, damaged something on purpose, or stolen something (1 = *not at all*, 4 = *10 or more times*). Sensation seeking was measured with three items from the Zuckerman scale ($\alpha = .58$; Zuckerman, 1996). We selected these items because they had high factor loadings in a previous study and were appropriate in content for adolescents. Finally, we measured the number of hours per week spent at home alone after school, and the total amount of time spent watching TV during a typical week. The latter was measured with a series of items tapping viewing at various times and on various days to increase reliability and validity of reports. Because of this statistical control, our sexual content variable should be viewed as reflecting the effect of a high proportion of sexual content relative to other material in one's TV diet, regardless of the total amount of TV exposure. This proportional measure is the same factor shown to predict sexual initiation in both Brown and Newcomer (1991) and Collins et al., (2004).

Missing Data Imputation

A small number of respondents had missing data on one or more predictor variables. Although the percentage missing on any given variable was less than 3%, listwise deletion of cases would have resulted in significant sample loss in our main multivariate analyses. To avoid any bias this might introduce in our results, we imputed missing data on these predictors (Little & Rubin, 1987). Viewership responses for two programs had a total of nine missing values. These were imputed by random draws from the empirical distribution. In addition, the first 263 teens interviewed were not asked about viewership of four programs due to an error in the instrument. The resulting missing values were imputed via random draws from the predicted probabilities of an ordinal logistic regression model with age, gender, interaction between age and gender, average TV viewing time and viewing frequency for the shows with no missing values serving as independent variables. A similar process, using all nonmissing covariates in the multivariate model as independent variables, was used to impute missing values on other covariates.

Analytic Approach

We used structural equation modeling to test our proposed model of the role of social-cognitive variables in mediating the relationship between adolescents' exposure to TV's sexual content and initiation of intercourse (see Figure 1). SEM is ideal for testing mediation; the use of latent variables minimizes measurement error and allows more accurate estimates of the amount of variance accounted for by a mediating variable. All analyses were conducted in Mplus 2.02 (Muthén & Muthén, 1998). To estimate our model parameters, we used weighted least squares with mean and variance adjustments (WLSMV), an asymptotically distribution-free (ADF) estimator that is appropriate for the analysis of models with categorical outcomes (Herzberg & Beauducel, 2004).

Following recommendations by Anderson and Gerbing (1988), we began by establishing the measurement portion of our model within a confirmatory factor analytic framework using maximum likelihood estimation. In this stage of model development, loadings between indicators and latent

¹ Because we used scenes and not episodes as the basis of our measure, our sample for judgments of content per program is considerably larger than the *n*'s of 2 to 14 might suggest.

factors were freely estimated and all exogenous variables were free to correlate with one another, as well as with the dichotomous dependent variable (intercourse initiation). The factor loading for the first item on each latent variable was set to 1.0 to establish its metric.

After establishing the measurement model, we fit the structural model in which paths representing theoretically based directional relationships (from exposure to TV's sexual content to each of the hypothesized mediators, and from each of the hypothesized mediators to intercourse initiation) replaced correlations. All correlations among the hypothesized social-cognitive mediators were retained in this model. We used multiple-group models to test (separately) for gender and racial/ethnic group differences in the structural relationships among exposure to sexual content, the social-cognitive mediators, and intercourse initiation, as well as differences in the influence of the covariates. The following covariates were included in all models as predictors of exposure to sexual content on TV, the proposed mediators, and intercourse initiation: age, family structure, parents' education, parental monitoring, school grades, whether the participants' friends were mainly older, mental health, self-esteem, religiosity, deviance, sensation seeking, and total TV viewing. In the multiple-group model by gender, we included race/ethnicity as a covariate, along with the other covariates. Similarly, we included gender as a covariate in the multiple-group model by race/ethnicity. In both multiple-group models, factor loadings for the measurement model were fixed to be equal across groups. Results indicate whether the other paths in the model can be assumed to be equal in the groups studied.

To evaluate overall model fit, we used the comparative fit index (CFI; Bentler, 1990) and the root mean square error of approximation (RMSEA; Steiger, 1998). A CFI value greater than .90 (Bentler, 1990) and a RMSEA less than .06 (Browne & Cudeck, 1993; Yu & Muthen, 2002) indicate good fit. Although it is considered a poor indicator of overall model fit in samples of this size (Marsh, Balla, & McDonald, 1988), we also report the model chi-square value because it is common to do so. We do not, however, use chi-square to assess the adequacy of fit of our models. To test for between-groups differences in the direct paths in our multiple-group models, we constrained each coefficient, one at a time, to be equal across groups. We then calculated the difference between chi-square statistics for the constrained and unconstrained models, and compared the chi-square difference statistic to a chi-square distribution with one degree of freedom. Because of the large number of tests performed, we used the Bonferroni correction for multiple comparisons to determine a critical value. Using this correction, a chi-square value of 10.83 is required for significance at the level of .05.

Results

Rates of Initiation by Demographic Group

Between the baseline and follow-up interviews, 15.6% of girls ($n = 103$) and 18.4% of boys ($n = 116$) initiated sexual intercourse (not a significant difference, $p = .18$ by a two-sample test of proportion), including 16.9% of Whites ($n = 174$), 19.3% of African Americans ($n = 23$), 17.0% of Hispanics ($n = 15$), and 12.1% of adolescents of other racial/ethnic backgrounds ($n = 9$; also not a significant difference, $p = .69$ by a chi-squared test with 3 degrees of freedom).

Measurement Model

Model fit statistics suggest that the measurement model fit the data well, $\chi^2(13, N = 1,292) = 44.14, p < .001$; CFI = .98; RMSEA = .04. The factor loadings for the measurement model are presented in Table 2. As the table shows, parameter tests for all factor loadings were significant at $p < .001$.

Table 2
Factor Loadings for the Measurement Model

Measure	Unstandardized loadings	SE	Standardized loadings	z^a
Safe-sex self-efficacy				
Obtain condoms	1.00 ^b		.78	
Talk with other sex about sex	0.85	.06	.65	14.87
Use condoms consistently	0.31	.03	.33	9.58
Negative outcome expectancies				
Feel guilty	1.00 ^b		.44	
Feel good ^c	1.15	.11	.55	10.78
Get an STD	0.78	.07	.54	10.69
Get a bad reputation	1.02	.09	.58	10.97

^a All significant at $p < .001$. ^b Parameter was fixed to 1.00 during estimation. ^c Item was reverse coded.

Structural Modeling

We began by testing a single group structural model that did not include the hypothesized social-cognitive mediators, and found a direct effect of exposure to TV's sexual content on intercourse initiation, $b = .13, SE = .05, p < .01, \beta = .11$, a finding that is consistent with our earlier research based on multiple regression analyses of data from this sample (Collins et al., 2004). Additional analyses revealed that the effect of TV's sexual content on intercourse initiation was robust across gender and racial and ethnic groups.

Our test of a single-group structural model that included the social-cognitive mediators revealed a significant amount of misfit, $\chi^2(151, N = 1,292) = 404.44, p < .001$; CFI = .87; RMSEA = .04. We were also unable to obtain an adequate fit with a multiple-group model by gender, and chi-square difference tests did not reveal significant differences between genders in the direct paths of our model. However, the three-group (African Americans vs. Hispanics vs. Whites and other races) structural model presented in Figure 2 represents an acceptable fit to the data, $\chi^2(157, N = 1,292) = 245.99, p < .001$; CFI = .91; RMSEA = .03. To emphasize the results of most interest, the figure presents only the key estimated structural model paths and coefficients (directional paths among the theoretically based predictors and the outcomes). Directional paths from the covariates to all model variables are excluded from the figure, as are all indicator variable loadings (these were uniformly strongly positive and significant) and the residual variances for all exogenous latent variables. The model accounted for 17% of the variance in intercourse initiation among African American adolescents, 32% of the variance in intercourse initiation among Hispanic adolescents, and 23% of the variance in intercourse initiation among white adolescents.

As predicted, there were significant pathways from exposure to sexual content on TV to perceived prosex norms and negative outcome expectancies. Adolescents with greater exposure to sexual content on TV also had fewer negative outcome expectancies and perceived more of their friends to be sexually active. Neither of these paths differed by racial/ethnic group. In turn, having fewer negative outcome expectancies and perceiving more of one's friends to be sexually active predicted a higher likelihood of initiating intercourse by the follow-up survey. There was no evidence that these pathways differed across racial/ethnic groups.

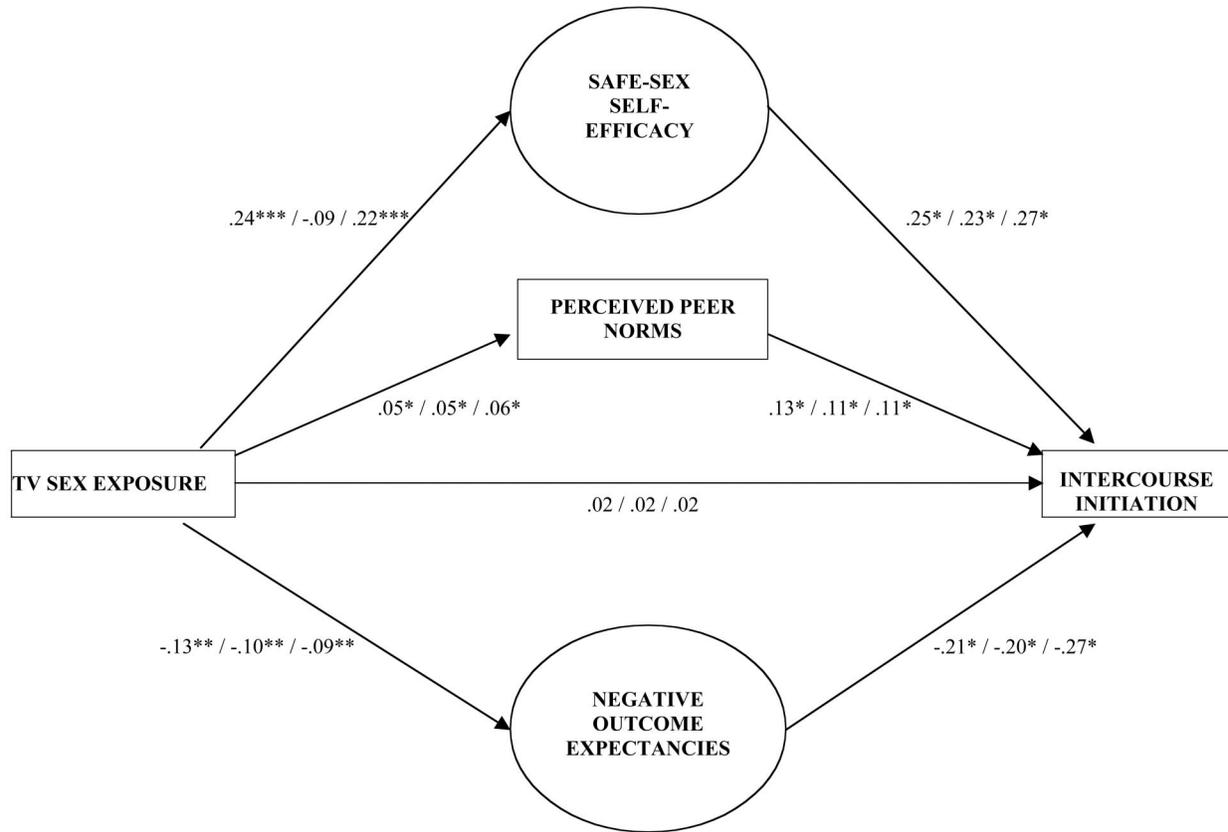


Figure 2. Structural model of the effect of exposure to TV's sexual content on intercourse initiation as mediated by social-cognitive variables, $\chi^2(157, N = 1,292) = 245.99$, CFI = .91, RMSEA = .03. Model estimated as multiple-groups comparison between African Americans ($n = 119$; first estimate shown), Hispanics ($n = 88$; second estimate shown), and Whites/other races ($n = 1,085$; third estimate shown). Values shown are standardized parameter estimates. All unstandardized estimates were set equal across groups except the estimate for the direct effect of TV's sexual content on self-efficacy. Model estimated correlations among the social-cognitive variables are presented in the text. Demographic and other control variables were included in the model but are not represented in the figure (see text). * $p < .05$. ** $p < .01$. *** $p < .001$.

Exposure to sexual content on TV positively predicted safe-sex self-efficacy among African American and white youth, but not among Hispanic youth. Finally, increased safe-sex self-efficacy predicted an increased likelihood of intercourse initiation, an effect that did not differ by racial/ethnic group. Additional predictors of intercourse initiation in the final three-group model included parents' education and participants' school grades, with lower parental education and lower grades each predicting a greater likelihood of intercourse initiation among all three groups. Among white adolescents only, being female was associated with a higher probability of intercourse initiation over the intervening year (probably because there were disproportionately more White females than males who were virgins at baseline).

Among all groups, safe-sex self-efficacy was positively related to perceived prosex norms. Adolescents with higher safe-sex self-efficacy believed that more of their friends were sexually active, $b = .08$, $SE = .01$, $p < .001$, $\beta = .12$. Negative outcome expectancies were negatively related to perceived prosex norms, $b = -.03$, $SE = .01$, $p < .001$, $\beta = -.12$, a relationship that also did not differ across racial and ethnic groups. Negative outcome

expectancies were related to lower sex self-efficacy among white adolescents, $b = -.06$, $SE = .01$, $p < .001$, $\beta = -.28$, but not among African American or Hispanic youth, $b = -.02$, $SE = .01$, $p = .15$, $\beta = -.12$.

Mediation Tests

Comparing the direct effect of exposure to sexual content on intercourse initiation, $b = .13$, $SE = .05$, $p < .01$, $\beta = .11$, with the effect of exposure to sexual content on intercourse initiation when the mediating variables are included in the model, $b = .02$, $SE = .05$, $p = .33$, $\beta = .01$, confirms the presence of mediation. It also indicates that the effect of TV is fully mediated by the social-cognitive variables; after accounting for the social-cognitive process, the relationship between exposure to televised sexual content and sexual initiation is near zero.

We tested whether the reduction of the direct effect of exposure to TV's sexual content due to each hypothesized mediator was statistically significant. To accomplish these tests, we used Baron

and Kenny's (1986) modification of the Sobel (1982) test,² which yields a statistic that is approximately distributed as z . The z test for the indirect effect of exposure to televised sexual content on intercourse initiation through negative outcome expectancies was marginally significant for all three racial/ethnic groups, $z = 1.72$, $p = .09$, as was the test for the indirect effect of exposure to televised sexual content on intercourse initiation through perceived peer norms, $z = 1.69$, $p = .09$.³ Sex self-efficacy significantly mediated the relationship between exposure to televised sexual content and intercourse initiation among African Americans and Whites, $z = 2.03$, $p = .04$, but not Hispanics ($z = -1.07$, $p = .23$). These findings support a theoretical model in which the relationship between exposure to sexual content on TV and intercourse initiation is mediated by safe-sex self-efficacy among African Americans and Whites.

Discussion

Previous research, including work with the current sample, has shown a relationship between exposure to televised sexual content and sexual initiation (Collins et al., 2004; Brown & Newcomer, 1991; Peterson, Moore, & Furstenberg, 1991). This is noteworthy, as earlier sexual initiation is a risk factor for outcomes ranging from STDs and pregnancy to lower academic achievement (Brown & Eisenberg, 1995; Koyle, Jensen, & Olsen, 1989). Prior work had also documented effects of exposure to TV's sexual content on the attitudes and beliefs of adolescents, but no previous study has provided an empirical test integrating these findings to examine the social influence process by which TV is thought to influence sexual initiation. The present study supports social-cognitive theory overall, but also identifies the specifics of the process in a way that can inform attempts to reduce TV's influence.

The strongest evidence for mediation was found for safe-sex self-efficacy, which was an important mediator of the effect of exposure to televised sexual content on intercourse initiation among African American and white adolescents. Among these groups, adolescents who frequently watched people talking about sex and behaving sexually on TV were more confident that they could enact safe sexual behaviors (e.g., obtaining condoms, communicating with a potential partner) than were adolescents with less exposure to sexual content on TV. Although heightened safe-sex self-efficacy predicted intercourse initiation among Hispanics, exposure to TV's sexual content did not influence the self-efficacy of Hispanic youth. Given the unexpected nature of this result and its lack of theoretical grounding, it may be a spurious discovery. It may also be that we did not adequately capture the TV that Hispanic youth are viewing. Our measures of content did not include telenovelas, Spanish language soap operas that are probably high in sexual content. However, it may be that the observed differences for Hispanics are substantive. What little research there is on the TV viewing habits and reactions of minority viewers tends to focus on African Americans. Although this work shows that African Americans identify with characters and watch shows even if the cast is all or primarily white, this may be less true for Hispanic youth, who may see the characters or portrayals on mainstream TV as less relevant to their culture. However, TV did have an impact on the outcome expectancies and perceived norms of Hispanic adolescents, so it clearly influences them in some

ways, although perhaps in ways less directly relevant to their own identities and self-perceptions.

Our results also parallel findings in the area of TV violence demonstrating that portrayals of consequences are critical in determining the effect of TV violence on aggressive behavior (Bandura, 1965; Bandura, Ross, & Ross, 1963; see also Kunkel et al., 1995) and extend those findings to a new and highly important realm. Across all racial and ethnic groups, viewing sexual content on TV was associated with less negative expectations about the potential consequences of having intercourse (e.g., social acceptance/rejection, STD infection, and pregnancy). This is not surprising given the rarity with which negative consequences of sex are included in or referred to on TV (Kunkel et al., 2003). Less negative expectancies were, in turn, associated with a higher likelihood of intercourse initiation. However, the direct test of the mediated effect of negative outcome expectancies provided only marginally significant evidence of such an effect. Although there are strong reasons to believe that the Sobel test of mediation is overly conservative (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002) and that negative outcome expectancies may indeed significantly mediate the relationship between exposure to televised sexual content and intercourse initiation, it may also be that we were unable to find an effect of outcome expectancies because we did not distinguish between shows that portray positive consequences and those that portray negative consequences of sexual behavior. It is difficult to make such a distinction, given that 85% of shows with sexual content make no reference to risk (Kunkel et al., 2003; but see Aubrey, 2004). Nevertheless, a measure that distinguishes between these two types of portrayals may provide clearer support for the mediating role of outcome expectancies.

Much criticism of TV has focused on normative effects. Cultivation theory (e.g., Gerbner, Gross, Morgan, & Signorielli, 1986) and SCT suggest that by watching TV adolescents learn about the frequency and importance of sex, and about the social norms that govern its occurrence. Consistent with this suggestion, we found some evidence that norms play a role in the effect of TV on sexual behavior. Greater exposure to sexual content on TV predicted higher estimates by participants of the prevalence of sexual initiation among their friends, and these perceived norms were related to behavior change. However, as with outcome expectancies, the direct test of the mediated effect of perceived peer norms provided only marginally significant evidence of mediation. Our single-item measure of perceived peer norms may have been too weak to capture a mediated effect of perceived peer norms, or it may be that perceived peer norms do, in fact, mediate the relationship between exposure and intercourse initiation, and the Sobel test of mediation is too stringent to confirm the presence of such an effect.

The finding that safe-sex self-efficacy and (possibly) outcome expectancies and perceived norms are key elements of the process by which TV influences sexual behavior is very useful in formulating interventions. Self-efficacy, norms, and outcome expectancies are probably closely linked, in practice (Bandura, 1986).

² The formula for this modified Sobel test is $z = a*b/\text{SQRT}(b^2 * sa^2 + a^2 * sb^2)$, where a is the effect of the independent variable on the mediator, b is the effect of the mediator on the outcome variable, sa is the standard error of a , and sb is the standard error of b .

³ Unless otherwise stated, the z value for all three groups is equivalent.

When adolescents identify with characters engaging in sexual talk and behavior, they are likely to develop confidence in their own ability to take these actions—but only to the extent that portrayals are of successful enactment. Although characters whose sexual comments meet with disapproval, or who mess up attempts at sexual behavior, are rare on TV, exposure to such portrayals is likely to increase negative outcome expectancies but unlikely to increase self-efficacy or change perceived norms. Portraying more of these kinds of events, particularly with teen characters, would be realistic, have lots of dramatic and comedic potential, and benefit adolescents. It also would not require TV writers to eliminate sexual content.

However, a caution with regard to this recommendation is necessary. The fact that our measure reflecting safe-sex self-efficacy was related to broader sexual content and sexual behavior suggests that self-efficacy with regard to sexual behavior in general is also experienced in this specific sense. Our measure of self-efficacy assessed adolescents' confidence in their ability to obtain condoms, use condoms consistently, and communicate with a potential partner. Interventions should take care not to undermine perceived ability in these areas. Confidence in these skills has been shown to be instrumental in reducing the risk of unwanted outcomes as a result of having sex (e.g., Jemmott, Jemmott, & Fong, 1992; NIMH Multisite HIV Prevention Trial Group, 2001). Thus, there is apparently an unexpected benefit of exposure to positive—or neutral—outcome portrayals. To avoid eliminating this benefit by showing negative outcomes from sex, depicting characters who discuss or perform safe sexual behaviors and then meet with positive or neutral outcomes (e.g., peer approval, heightened intimacy with one's partner) would probably be appropriate, and is likely to more directly encourage responsible sexual behavior in adolescent viewers, as well.

Countering the effect of TV content on normative perceptions is likely to be more difficult, at least without reducing the frequency with which sex is portrayed and/or watched by youth. The very high prevalence of sexual content across programs, genres, and channels is likely the source of perceptions that more people are sexually active, and portraying negative consequences is unlikely to do more than dampen this perception. However, avoiding the portrayal of teen characters as sexually active and presenting sexually inexperienced adolescent characters as popular with their peers may help, since these teen models seems most likely to influence adolescent perceptions of their peers. Finally, promoting a skeptical response to media among youth, through media literacy education in schools or public information campaigns may be useful. Youth who learn to disregard or counterargue the images of TV may be less influenced by what they see, no matter how pervasive.

Our study provides the only investigation to date of whether social-cognitive processes mediate the relationship between exposure to TV's sexual content and adolescent sexual behavior, and does so using a rigorous design and analytic methods. In interpreting its results, however, a couple of limitations should be kept in mind. First, causal conclusions about mediation to be drawn from our study are limited by the fact that we did not have preexposure measures of the social-cognitive variables under investigation. Mediation is best tested with structural models based on three or more waves of data so that one can control for status on the proposed mediators prior to exposure to the hypothesized cause

(Kline, 1998). We measured adolescents' exposure to sexual content on TV for a 6-month reference period prior to our survey, and their sex-related beliefs at the time of the survey. Although the reference period for TV exposure preceded the measures of normative perceptions, safe-sex self-efficacy, and sex-related outcome expectancies, because these variables were all measured at baseline, it is likely that adolescents' TV viewing partly reflects changes in these cognitions that had already occurred prior to the baseline survey. However, unless they are constant, the cognitions reported at baseline are likely to have influenced only that TV viewing that occurred immediately prior to the baseline survey rather than TV viewing that occurred earlier in the 6-month reference period. Moreover, in other analyses of data from this sample, we found that although adolescents' baseline levels of sexual interest and readiness were associated with greater exposure to sexual content on TV subsequently, sexual interest and readiness accounted for less than two percent of the variance in viewing of sexual content on TV (Kim et al., in press). These findings suggest that although the relationships are probably bidirectional, the effects of social-cognitive factors on TV viewing are likely to be very small. Nonetheless, although our findings are consistent with hypotheses drawn from social-cognitive observational learning theory, and fit the time sequence specified by that theory, the causal nature of the association between exposure to sexual content on TV and sex-related beliefs cannot be unequivocally demonstrated with our data. Future longitudinal research should collect and analyze data from at least three time points to provide a more stringent test of mediation.

A second limitation of our study is that we focused entirely on intercourse initiation, and did not examine noncoital behaviors. We cannot say, therefore, whether the viewing of sexual content on TV would influence sexual experiences other than intercourse through the same processes that we have demonstrated for intercourse initiation. However, in other work with this data, we found a significant relationship between viewing of TV's sexual content and noncoital behavior that is similar in magnitude to the relationship between viewing of TV's sexual content and intercourse initiation (Collins et al., 2004). Thus, there is reason to believe that similar findings might emerge if we were to examine social-cognitive processes mediating the link between exposure to televised sexual content and noncoital behavior.

Conclusion

Adolescent sexual behavior is diverse, complicated, and driven by many forces—internal, interpersonal, and environmental. Among these many contributors, one appears to be media use. In this study we have demonstrated that exposure to sexual content on TV hastens the initiation of intercourse through a process of social learning. However, media use is more than exposure and amount of viewing. Perceived realism, viewing motives, viewer identification with TV characters, and cognitive processing factors, such as elaboration or counterarguing of the messages involved, are likely to play important roles in determining the influence of media exposure on adolescent sexual behavior. Additional research that considers the moderating influence of these and other factors is needed to continue to refine our understanding of this complex phenomenon.

References

- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step procedure. *Psychological Bulletin*, *103*, 411–423.
- Aubrey, J. S. (2004). Sex and punishment: An examination of sexual consequences and the sexual double standard in teen programming. *Sex Roles*, *50*, 505–514.
- Aubrey, J. S., Harrison, K., Kramer, L., & Yellin, J. (2003). Variety versus timing: Gender differences in college students' sexual expectations as predicted by exposure to sexually oriented television. *Communication Research*, *30*, 432–460.
- Bachanas, P. J., Morris, M. K., Lewis-Gess, J. K., Sarett-Cuasay, E. J., Sirl, K., Ries, J. K., & Sawyer, M. K. (2002). Predictors of risky sexual behavior in African American adolescent girls: Implications for prevention interventions. *Journal of Pediatric Psychology*, *27*, 519–530.
- Bandura, A. (1965). Influence of models' reinforcement contingencies on the acquisition of imitative responses. *Journal of Personality and Social Psychology*, *1*, 589–595.
- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Bandura, A., Ross, D., & Ross, S. A. (1963). Imitation of film-mediated aggressive models. *Journal of Abnormal and Social Psychology*, *66*, 3–11.
- Bandura, A., & Walters, R. H. (1963). *Social learning and personality development*. New York: Holt, Rinehart and Winston.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173–1182.
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, *107*, 238–246.
- Billy, J., & Udry, J. (1985). Patterns of adolescent friendship and effects on sexual behavior. *Social Psychology Quarterly*, *48*, 27–41.
- Borawski, E. A., Ievers-Landis, C. E., Lovegreen, L. D., & Trapl, E. S. (2003). Parental monitoring, negotiated unsupervised time, and parental trust: The role of perceived parenting practices in adolescent health risk behaviors. *Journal of Adolescent Health*, *33*, 60–70.
- Brown, J. D., Childers, K. W., & Waszak, C. (1990). Television and adolescent sexuality. *Journal of Adolescent Health Care*, *11*, 62–70.
- Brown, J. D., Mebane, F., & Lingle, K. (2004, March). *Mass media as sexual super peer*. Paper presented at the biennial meeting of the Society for Research on Adolescence, Baltimore.
- Brown, J. D., & Newcomer, S. F. (1991). Television viewing and adolescents' sexual behavior. *Journal of Homosexuality*, *21*, 77–91.
- Brown, S., & Eisenberg, L. (1995). *The best intentions: Unintended pregnancy and the well-being of children and family*. Washington, DC: National Academy Press.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. *Sociological Methods and Research*, *21*, 230–239.
- Buerkel-Rothfuss, N., & Strouse, J. (1993). Media exposure and perceptions of sexual behaviors: The cultivation of hypothesis moves to the bedroom. In B. Greenberg, J. Brown & N. Buerkel-Rothfuss (Eds.), *Media, sex and the adolescent*. Cresskill, NJ: Hampton Press, Inc.
- Bushman, B. J., & Anderson, C. A. (2001). Media violence and the American public: Scientific facts versus media misinformation. *American Psychologist*, *56*, 477–489.
- Bushman, B. J., & Huesmann, L. R. (2001). Effects of televised violence on aggression. In D. Singer & J. Singer (Eds.), *Handbook of children and the media* (pp. 223–254). Thousand Oaks, CA: Sage.
- Carvajal, S. C., Parcel, G. S., Basen-Engquist, K., Banspach, S. W., Coyle, K. K., Kirby, D., & Chan, W. (1999). Psychosocial predictors of delay of first intercourse by adolescents. *Health Psychology*, *18*, 443–452.
- Centers for Disease Control and Prevention. (2002). Trends in sexual risk behaviors among high school students - United States, 1991–2001. *Morbidity and Mortality Weekly Report*, *51*, 856–859.
- Cohen, E. S., & Fromme, K. (2002). Differential determinants of young adult substance use and high-risk sexual behavior. *Journal of Applied Social Psychology*, *32*, 1124–1150.
- Collins, R. L., Ellickson, P. L., & Bell, R. M. (1998). Simultaneous polydrug use among teens: Prevalence and predictors. *Journal of Substance Abuse*, *10*, 233–253.
- Collins, R. L., Elliott, M. N., Berry, S. H., Kanouse, D. E., Kunkel, D., Hunter, S. B., & Miu, A. (2004). Watching sex on TV predicts adolescent initiation of sexual behavior. *Pediatrics Electronic Pages*, *114*, e1–e10.
- Delamater, J. (1981). The social control of sexuality. *Annual Review of Sociology*, *7*, 263–290.
- Dilorio, C., Dudley, W. N., Kelly, M., Soet, J. E., Mbwar, J., Potter, J. S. (2001). Social cognitive correlates of sexual experience and condom use among 13- through 15-year-old adolescents. *Journal of Adolescent Health*, *29*, 208–216.
- Gerbner, G., Gross, M., Morgan, & Signorielli, N. (1986). Living with television: The dynamics of the cultivation process. In J. Bryant & D. Zillman (Eds.), *Perspectives on media effects* (pp. 17–40). Hillsdale, NJ: Erlbaum.
- Gilbert, M. A., Bauman, K. E., & Udry, R. (1986). A panel study of subjective expected utility for adolescent sexual behavior. *Journal of Applied Social Psychology*, *16*, 745–756.
- Greenberg, B. S. (1994). Content trends in media sex. In D. Zillmann, J. Bryant, & A. C. Huston (Eds.), *Media, children, and the family: Social scientific, psychodynamic and clinical perspectives* (pp. 165–182). Hillsdale, NJ: Erlbaum.
- Greenberg, B. S., & Atkin, C. (1982). Learning about minorities from television: A research agenda. In G. Berry & G. Mitchell-Kernan (Eds.), *Television and the socialization of the minority child* (pp. 215–243). New York: Academic Press.
- Greenberg, B. S., Linsangan, R., & Soderman, A. (1993). Adolescents' reactions to television sex. In B. S. Greenberg, J. D. Brown, & N. L. Buerkel-Rothfuss (Eds.), *Media, sex and the adolescent* (pp. 196–224). Cresskill, NJ: Hampton Press, Inc.
- Hearold, S. L. (1986). A synthesis of 1043 effects of television on social behavior. In G. Comstock (Ed.), *Public communication and behavior* (Vol. 1, pp. 65–133). Orlando, FL: Academic Press.
- Herzberg, P. Y., & Beauducel, A. (2004, July). *The performance of maximum likelihood (ML) versus means and variance adjusted weighted least square (WLSMV) estimation in confirmatory factor analysis*. Paper presented at the biennial meeting of the Society for Multivariate Analysis in the Behavioral Sciences, Jena, Germany.
- Hogan, D. P., & Kitagawa, E. M. (1985). The impact of social status, family structure, and neighborhood on the fertility of black adolescents. *American Journal of Sociology*, *90*, 825–855.
- Huesmann, L. R. (1998). The role of social information processing and cognitive schemas in the acquisition and maintenance of habitual aggressive behavior. In R. G. Geen & E. Donnerstein (Eds.), *Human aggression: Theories, research, and implications for policy* (pp. 73–109). New York: Academic Press.
- Huesmann, L. R., Moise-Titus, J., Podolski, C. L., & Eron, L. D. (2003). Longitudinal relations between children's exposure to TV violence and their aggressive and violent behavior in young adulthood: 1977–1992. *Developmental Psychology*, *39*, 201–221.
- Jemmott, J. B., Jemmott, L. S., & Fong, G. T. (1992). Reductions in HIV risk-associated sexual behaviors among black male adolescents: Effects of an AIDS prevention intervention. *American Journal of Public Health*, *82*, 372–377.

- Kahn, J. R., Hofferth, S. L., & Kalsbeek, S. (1988). National studies of teenage sexual activity: Evaluating the comparability of three national surveys. *Demography*, 25, 189–204.
- Katz, E. C., Fromme, E., & D'Amico, E. J. (2000). Effects of outcome expectancies and personality on young adults' illicit drug use, heavy drinking, and risky sexual behavior. *Cognitive Therapy and Research*, 24, 1–22.
- Kim, J. L., Collins, R. L., Kanouse, D. E., Elliott, M. N., Berry, S. H., Hunter, S. B., Miu, A., & Kunkel, D. (in press). Sexual readiness, household policies, and other predictors of adolescents' exposure to sexual content in mainstream entertainment television. *Media Psychology*.
- Kinsman, S. B., Romer, D., Furstenberg, F. F., & Schwarz, D. F. (1998). Early sexual initiation: The role of perceived norms. *Pediatrics*, 102, 1185–1192.
- Kline, R. (1998). *Structural modeling*. New York: Guilford Press.
- Kosterman, R., Hawkins, J. D., Guo, J., Catalano, R. F., & Abbott, R. D. (2000). The dynamics of alcohol and marijuana initiation: Patterns and predictors of first use in adolescence. *American Journal of Public Health*, 90, 360–366.
- Koyle, P., Jensen, L., & Olsen, J. (1989). Comparison of sexual behaviors among adolescents having an early, middle and late first intercourse experience. *Youth and Society*, 20, 461–476.
- Kunkel, D., Eyal, K., Biely, E., Cope-Farrar, K., Donnerstein, E., & Fandrich, R. (2003). *Sex on TV 3: A Biennial Report to the Kaiser Family Foundation*. Menlo Park, CA: Kaiser Family Foundation.
- Kunkel, D., Wilson, B., Donnerstein, E., Linz, D., Smith, S., Gray, T., Blumenthal, E., & Potter, W. J. (1995). Measuring television violence: The importance of context. *Journal of Broadcasting and Electronic Media*, 39, 284–291.
- Lavery, B., Siegel, A. W., Cousins, J. H., & Rubovits, D. S. (1993). Adolescent risk-taking: An analysis of problem behaviors in problem children. *Journal of Experimental Child Psychology*, 55, 277–294.
- Little, R. J. A., & Rubin, D. B. (1987). *Statistical analysis with missing data*. New York: Wiley.
- Lowry, D. T., & Shindler, J. A. (1993). Prime time TV portrayals of sex, "safe sex" and AIDS: A longitudinal analysis. *Journalism Quarterly*, 70, 628–637.
- MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test the significance of the mediation and intervening variable effects. *Psychological Methods*, 7, 83–104.
- Marsh, H. W., Balla, J. R., & McDonald, R. P. (1988). Goodness-of-fit indices in confirmatory factor analysis: The effect of sample size. *Psychological Bulletin*, 103, 391–411.
- Miller, B. C., & Moore, K. A. (1990). Adolescent sexual behavior, pregnancy, and parenting: Research through the 1980s. *Journal of Marriage and the Family*, 52, 1025–1044.
- Muthén, L. K., & Muthén, B. O. (1998). *Mplus user's guide*. Los Angeles: Muthén & Muthén.
- National Campaign to Prevent Teen Pregnancy. *With one voice 2002: America's adults and teens sound off about teen pregnancy*. Washington DC: National Campaign to Prevent Teen Pregnancy.
- National Institute of Mental Health Multisite HIV Prevention Trial Group. (2001). Social-cognitive theory mediators of behavior change in the National Institute of Mental Health Multisite HIV Prevention Trial. *Health Psychology*, 20, 369–376.
- Newcomb, M., Huba, G., & Bentler, P. (1986). Determinants of sexual and dating behavior among adolescents. *Journal of Personality and Social Psychology*, 50, 428–438.
- Nolin, M. J., & Petersen, K. K. (1992). Gender differences in parent-child communication about sexuality: An exploratory study. *Journal of Adolescent Research*, 7, 59–79.
- Paik, H., & Comstock, G. (1994). The effects of television violence on antisocial behavior: A meta-analysis. *Communication Research*, 21, 516–546.
- Peterson, J. L., Moore, K. A., & Furstenberg, F. F., Jr. (1991). Television viewing and early initiation of sexual intercourse: Is there a link? *Journal of Homosexuality*, 21(1–2):93–118.
- Roberts, D. F. (2000). Media and youth: Access, exposure, and privatization. *Journal of Adolescent Health*, 27(Suppl. 1), 8–14.
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
- Rosenthal, D., Moore, S., & Flynn, I. (1991). Adolescent self-efficacy, self-esteem and sexual risk-taking. *Journal of Community and Applied Social Psychology*, 1, 77–88.
- Santelli, J. S., Kaiser, J., Hirsch, L., Radosh, A., Simkin, L., & Middlestadt, S. (2004). Initiation of sexual intercourse among middle school adolescents: The influence of psychosocial factors. *Journal of Adolescent Health*, 34, 200–208.
- Schvaneveldt, P. L., Miller, B. C., Berry, E. H., & Lee, T. R. (2001). Academic goals, achievement, and age at first sexual intercourse: Longitudinal, bidirectional influences. *Adolescence*, 36, 767–787.
- Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. In S. Leinhardt (Ed.), *Sociological methodology* (pp. 290–312). San Francisco: Jossey-Bass.
- Steiger, J. H. (1998). A note on multiple sample extensions of the RMSEA fit index. *Structural Equation Modeling*, 5, 411–419.
- Strickland, D. E. (1983). Advertising exposure, alcohol consumption and misuse of alcohol. In M. Grant, M. Plant, & A. Williams (Eds.), *Economics and alcohol: consumption and controls* (pp. 201–222). New York: Gardner Press, Inc.
- Strouse, J., & Buerkel-Rothfus, N. (1993). Media exposure and the sexual attitudes and behaviors of college students. In B. Greenberg, J. D. Brown & N. Buerkel-Rothfus (Eds.), *Media, sex and the adolescent*. Cresskill, NJ: Hampton Press, Inc.
- Taris, T. W., & Semin, G. R. (1998). How mothers' parenting styles affect their children's sexual efficacy and experience. *Journal of Genetic Psychology*, 159, 68–81.
- Walsh-Childers, K., & Brown, J. D. (1993). Adolescents' acceptance of sex-role stereotypes and television viewing. In B. S. Greenberg, J. D. Brown, & N. L. Buerkel-Rothfuss (Eds.), *Media, sex and the adolescent* (pp. 117–133). Cresskill, NJ: Hampton Press, Inc.
- Ward, L. M. (1995). Talking about sex: Common themes about sexuality in prime-time television programs children and adolescents view most. *Journal of Youth and Adolescence*, 24, 595–615.
- Ware, J. E., Jr., & Sherbourne, C. D. (1992). The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Medical Care*, 30, 473–483.
- Weinstock, H., Berman, S., & Cates, Jr., W. (2004). Sexually transmitted diseases among American youth: Incidence and prevalence estimates. *Perspectives in Sexual and Reproductive Health*, 36, 6–10.
- Yu, C. Y., & Muthén, B. (2002). *Evaluation of model fit indices for latent variable models with categorical and continuous outcomes* (Technical report). Los Angeles: UCLA, Graduate School of Education & Information Studies.
- Zuckerman, M. (1996). Notes and shorter communications: Item revisions in the Sensation Seeking Scale Form V (SSS-V). *Personality and Individual Differences*, 20, 515.

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