AGGRESSIVE BEHAVIOR
Volume 37, pages 1–18 (2011)

X-Rated Material and Perpetration of Sexually Aggressive Behavior Among Children and Adolescents: Is There a Link?

Michele L. Ybarra[1]*, Kimberly J. Mitchell[2], Merle Hamburger[3], Marie Diener-West[4], and Philip J. Leaf[4]

[1]*Internet Solutions for Kids, Santa Ana, California*
[2]*University of New Hampshire, Durham, New Hampshire*
[3]*Centers for Disease Control and Prevention, Atlanta, Georgia*
[4]*John Hopkins School of Public Health, Baltimore, Maryland*

Longitudinal linkages between intentional exposure to x-rated material and sexually aggressive behavior were examined among youth 10–15 year olds surveyed nationally in the United States. At Wave 1 in 2006, participants (n = 1,588) were queried about these exposures and outcomes in the preceding 12 months. Wave 2 data (n = 1,206) were collected approximately 12 months after Wave 1 and Wave 3 data (n = 1,159) were collected approximately 24 months after Wave 1. Thus, data for this project represent a 36-month time frame. A marginal model with generalized estimating equations was used to represent the population-average odds of sexually aggressive behavior over the 36 months as a function of exposure to x-rated material over the same time and to account for clustering in the data within person over time. An average of 5% of youth reported perpetrating sexually aggressive behavior and 23% of youth reported intentional exposure to x-rated material. After adjusting for other potentially influential proximal (i.e., sexual aggression victimization) and distal characteristics (e.g., substance use), we found that intentional exposure to violent x-rated material over time predicted an almost 6-fold increase in the odds of self-reported sexually aggressive behavior (aOR: 5.8, 95% CI: 3.2, 10.5), whereas exposure to nonviolent x-rated material was not statistically significantly related (aOR: 1.7, 95% CI: 0.94, 2.9). Associations were similar for boys and girls (boys nonviolent x-rated material aOR = 2.0, 95% CI: 0.8, 4.7; violent x-rated material aOR = 6.5, 95% CI: 2.7, 15.3; girls nonviolent x-rated material aOR = 1.2, 95% CI: 0.5, 3.2; violet x-rated material aOR = 6.1, 95% CI: 2.5, 14.8). Aggr. Behav. 37:1–18, 2011. © 2010 Wiley-Liss, Inc.

Keywords: pornography; internet; sexual aggression; youth violence prevention; longitudinal study

INTRODUCTION

Sexual violence is a serious public health issue with more than two million victims and associated costs estimated at almost $200 billion in the United States each year [Miller et al., 1996]. In addition to societal costs, the impact on the individual can be high, including increased rates of post traumatic stress disorder [Cortina and Kubiak, 2006], physical health problems [Conoscenti and McNally, 2006], and suicidal threats and attempts [McFarlane et al., 2005]. Although no nationwide estimates for perpetrators of sexual violence exist [Abbey, 2005], and state estimates vary significantly [Miller et al., 1996], results from crime reports in 12 states indicate that sexually aggressive behaviors may emerge during adolescence [Snyder, 2000].

The contribution of x-rated material and pornography to deviant sexual behavior, negative attitudes towards women, and the acceptance of deviant or aggressive sexual behavior among peers in nonclinical and non-adjudicated adults has been studied for decades. Most studies report that sexually aggressive behavior and attitudes are elevated for adults who report pornography consumption [Carroll et al., 2008; Malamuth et al., 2000; Vega and Malamuth, 2007; Williams et al., 2009]. Violent pornography may be particularly influential in affecting behavior compared to

Grant sponsor: Centers for Disease Control and Prevention (CDC); Grant number: U49/CE000206.

*Correspondence to: Michele L. Ybarra, Internet Solutions for Kids, 1820 East Garry Ave #105, Santa Ana, CA 92705.
E-mail: Michele@ISolutions4kids.org

Received 6 May 2009; Accepted 17 August 2010

Published online 2 November 2010 in Wiley Online Library (wileyonlinelibrary.com). DOI: 10.1002/ab.20367

© 2010 Wiley-Liss, Inc.

nonviolent pornography [Demaré et al., 1988; Donnerstein and Linz, 1986; Linz et al., 1984]. Furthermore, men who are at "high risk" for sexual aggression seem to be particularly affected by frequent pornography consumption [Vega and Malamuth, 2007].

Several theoretical perspectives have been put forth to explain the relationship between pornography exposure and sexual aggression: classical and operant conditioning theories, excitation transfer theory, and social learning theory being the most prevalent [Seto et al., 2001]. Most of these theories overlap conceptually and researchers typically incorporate components from each when conceptualizing and interpreting their research. Of particular relevance to the current analyses is observational social learning theory [Bandura, 1977]. This theory suggests that human beings learn specific social behaviors directly from observing others, imitating them, and having their behavior then reinforced. Violence in the form of interactive media may provide the opportunity to observe violence, practice it, and have it reinforced through repetition, reward, and realism [Anderson et al., 2007]. From this perspective, viewing pornography that portrays sexual aggression as rewarding may increase an individual's own sexually aggressive behavior. It follows that sexual aggression would be the result of violent, but not necessarily nonviolent pornography exposure [Allen et al., 1995].

Pornography exposure does not always result in sexual aggression, and sexually aggressive individuals have not all been exposed to pornography. As such, the etiology of sexual aggression perpetration is thought to be the result of a confluence of factors. Proximal are those that are directly related to sexual aggression [Malamuth, 2003; Williams et al., 2009]. Pornography is considered to be a proximal factor, as is sexual victimization—particularly for boys [Casey and Lindhorst, 2009; Hickey et al., 2008; Seto and Lalumière, 2010]. Distal factors are those that may predispose a young person to behave in an antisocial or aggressive manner more generally, and therefore contribute to sexual aggression indirectly. These include starting fights [de Bruijn et al., 2006; Lacasse and Mendelson, 2007; Ozer et al., 2004], bullying [de Bruijn et al., 2006], alcohol and drug use [Borowsky et al., 1997; Lacasse and Mendelson, 2007; Maxwell et al., 2003], and anger [Krahe, 1998]. Witnessing family violence may model aggressive behavior for children and adolescents. Exposure thus affects one's general disposition towards aggression, thereby making it another possible distal factor for sexual violence [Borowsky et al., 1997]. On the other hand, academic achievement and connectedness with adults are protective distal factors, buffering the impact of one's risk factors for violence and deviance [Borowsky et al., 1997]. Together, distal and proximal factors affect sexual aggression. In order to understand the specific impact that pornography may have for youth who perpetrate sexual aggression, both distal and proximal factors must be taken into account.

Exposure to Sexual Material in Adolescence

Adolescent sexual development is complex and dynamic. As children get older, they gain a greater sense of their sexual self [Ponton and Judice, 2004], enhanced by an interplay of biological and social changes as the individual matures through childhood into adolescence. Research links both the stage of pubertal maturation and timing of puberty to adolescent sexual activity [Crockett et al., 2003; Halpern et al., 1993]. While puberty is often thought to be the impetus of adolescent sexual behavior, much of adolescents' behavior is learned from social, cultural, and contextual influences [Katchadourian, 1990]. Because so much of one's sexual development occurs during adolescence, some health professionals are particularly concerned about the possible effect of pornography consumption on deviant sexual development, such as sexual callousness, during this developmental period [Zillmann, 2000].

Recent studies suggest that exposure to sexual material is common. Fifteen percent of 12–17 year olds report looking at x-rated material either online or through traditional mediums [Ybarra and Mitchell, 2005]. When unwanted exposure also is included, 42% of 12–17 year olds in one nationally representative survey report any exposure to x-rated material online [Wolak et al., 2007], and 70% of 15–17 year old Internet users in another nationally representative survey reported accidentally viewing pornography online "very" or "somewhat" often [Rideout, 2001].

Exposure to sexually explicit material has been associated with risky sexual behavior. In a longitudinal study of adolescents from 14 public high schools in the southeastern United States, Brown and L'Engle report that sexual behavior, particularly oral sex and vaginal sex, is more common among youth reporting exposure to pornography compared to unexposed youth [Brown and L'Engle, 2009]. Chandra et al. [2008] report that high levels of sexual content in one's media is associated with significantly elevated odds of teen pregnancy over time. Tolman et al. [2007] conducted a study of

adolescents' exposure to sexual stereotypical characters on television. Girls who reported seeing female characters who were sexually objectified and male characters who were commitment-phobic had lower scores of sexual agency compared to nonexposed girls [Tolman et al., 2007]. Findings are noted outside the United States as well. A longitudinal study conducted with Dutch adolescents aged 13–20 years found that exposure to sexually explicit Internet material stimulated sexual preoccupancy (i.e., a strong cognitive engagement in sexual issues, sometimes to the exclusion of other thoughts) [Peter and Valkenburg, 2008]. This path was fully mediated by subjective sexual arousal for the material and this effect of exposure to sexual material on subjective arousal did not differ between male and female adolescents.

Technology and Sex

Use of the internet has exploded among youth, with estimates suggesting that more than nine in ten adolescents are now online [Lenhart et al., 2010]. Unfettered access to the internet may lead to an overall increase in the numbers of youth seeking out pornographic material [Bross, 2005; Paul and Bryant, 2005]. Data collected in 2000, however, suggest that adolescents' intentional exposure to pornography was equally likely to be from movies and magazines than from the internet [Ybarra and Mitchell, 2005]. While the report of both intentional and unintentional exposure to pornography online increased from 2000 to 2005 [Wolak et al., 2007], it is unclear whether the internet has become the most common source of intentional pornography exposure among adolescents. Understanding where youth are accessing x-rated material is integral, however, for effectively targeting prevention and intervention activities aimed at reducing adolescents' exposure.

Gaps in the Literature

Research with adults suggests that exposure to x-rated material may be related to the perpetration of sexual aggression [Carroll et al., 2008; Malamuth et al., 2000; Vega and Malamuth, 2007; Williams et al., 2009]. Data also suggest that exposure to sexual material in adolescence may affect sexual behavior and attitudes [Brown and L'Engle, 2009; Chandra et al., 2008; Tolman et al., 2007]. Given that the majority of the nonclinical, nonadjudicated research has been based upon small samples of university psychology students [e.g., Carroll et al., 2008; Vega and Malamuth, 2007; Williams et al., 2009], less is known about the more general population of young people, particularly those who are not yet of college age. Additionally, examinations of x-rated material and sexual aggression perpetration in adolescence have not yet been reported. To begin addressing identified gaps in our understanding of pornography exposure and the etiology of sexual aggression, we will examine the following questions: (1) do youth exposed to x-rated material have elevated odds of perpetrating sexually aggressive behavior compared to those not exposed to pornography; (2) is a possible association retained after other influential factors noted in the literature are taken into account?; (3) are characteristics of the x-rated material—specifically violent versus non-violent content, and the medium through which the material is consumed—important in understanding a possible association?; (4) is the possible association different for boys and girls?

METHODS

The Growing up with Media Survey examines the longitudinal linkages between the exposure to violence in media and expression of violent behaviors. Wave 1 (baseline) data were collected from 1,588 households with youth 10–15 years old that were recruited between August and September, 2006. Wave 2 data were collected between November 2007–January 10, 2008 ($n = 1{,}206$) and Wave 3 data between August and November 2008 ($n = 1{,}159$). The protocol was reviewed and approved by the Centers for Disease Control and Prevention (CDC) Human Subjects Review Board. The surveys were administered by Harris Interactive.

Survey Respondents

Based upon survey design, about half (51%) of youth participants were female with an average age of 12.6 years (range: 9–16) at Wave 1 (weighted data; baseline). Seventy-one percent of youth respondents were White, 14% Black, 9% mixed race, and 7% all other races. Eighteen percent reported Hispanic ethnicity. Consistent with other nationally representative surveys of internet-using youth [Finkelhor et al., 2000; Lenhart et al., 2005; USC Annenberg School Center for the Digital Future, 2004; Wolak et al., 2006], households in the current survey were slightly more likely to report a post-graduate college degree (e.g., PhD, MD) and a household income of $75,000 or more than the average US household, and less likely to report

Hispanic ethnicity. Respondents to the survey were similar to US households with internet access and children between the ages of 10 and 15 years. Differential drop out by biological sex across Waves was not observed (49% male at Wave 1, 50% male at Wave 2, 49% male at Wave 3: Design-based $F(1.9, 3037) = 0.32$; $P = .71$). A table with detailed demographic characteristics of the sample is available upon request.

Data Source Sampling Method

Adult respondents were randomly identified members of the Harris Poll Online (HPOL), which includes over 4 million members [Harris Interactive, 2006]. When adult HPOL members clicked on the survey invitation email, they were sent to a secure website where they completed an eligibility questionnaire. They were asked to provide demographic information about all the children living in their household. Youth were randomly identified from the list of eligible children provided by the adult, with stratification goals based upon sex and age. Four strata were created: 10–12 year old boys, 10–12 year old girls, 13–15 year old boys, and 13–15 year old girls.

Caregiver respondents were required to be the adult living in the household who was equally or most knowledgeable about the youth's media use and read English. Youth respondents were required to be 10–15 years old,[1] read English, and have used the internet in the last 6 months. This resulted in a broad range of internet use and exposure.

After eligibility was confirmed and consent obtained from the adults, adults completed a 5-min online survey. They then passed the survey to the youth who provided assent and completed the, on average, 21-min online survey. Youth were encouraged to return to the survey later if they were not in a separate space where their responses could be kept private from others. Youth received a $15 gift certificate and caregivers $10 for their participation.

[1]In 12-month and Wave 3 (24-month follow-up), respondents were asked their year of birth and birthday to confirm their identity. As part of this process, 18 youth were identified to be 9 years of age, and 12 youth to be 16 years of age at Wave 1 (baseline). They are retained in the sample because adults were asked to report the age of their children during the eligibility screen before they knew the eligibility criteria for the study. There was no reason therefore that they would purposefully report a different age; rather we posit that they were rounding up or down for other reasons (e.g., forgetfulness, proximal birthday, etc.). Findings are similar with and without the inclusion of these 18 youth in the analytical sample.

External and Internal Validity of the Sample

Random Digit Dialing (RDD) response rates typically appear higher than online response rates because it is impossible for online surveys to determine whether the email has reached the intended recipient's inbox (as opposed to being filtered out by spam filters), and individuals who have not "picked up" their email. The response rate for this online survey was calculated as the number of individuals who started the survey divided by the number of email invitations sent less any email invitations that were returned as undeliverable. The Wave 1 (baseline) survey response rate, 26%, was within the expected range of well-conducted online surveys. To maximize response rate, respondents were invited to take part in the 24-month follow-up survey irrespective of their participation at 12-month follow-up. Follow-up response rates were 76 and 73%, respectively. Typical efforts to maximize the response rate were taken, including controlling the sample so that email invitations were sent out in Waves (as opposed to all at once) and reminder emails were sent to nonresponders.

Measures

The survey instrument went through common development techniques including a review of the literature for existing measures, development of items for new measures that were then reviewed by experts in the field, and a pilot study of 100 recruited households. All measures refer to the previous 12 months unless otherwise indicated.

Perpetration of Sexual Aggression

Measurement of perpetration of sexual aggression included in-person sexual assaults and technology-based sexual harassment and/or solicitation. Due to their low endorsement rate, a dichotomous indicator was created collapsing both types of perpetration to reflect youth who reported ever engaging in either behavior in the last year versus never.

In-person sexual assault. A review of the literature failed to yield any measure of youth-perpetrated sexual aggression that was developmentally appropriate for the age range of youth in the survey (10–15 years). For example, the language used in the Adolescent Health National Longitudinal Survey of Adolescents was: "Did you ever physically force someone to have sexual intercourse against their will?" [Udry, 1996]. Particularly the phrase "sexual intercourse" was considered unlikely to be meaningful for children. As such, a measure

was created to describe sexual aggression, using terms that would be understandable to those as young as 10 years of age. Specifically, youth were asked how many times they had "kissed, touched, or done anything sexual with another person when that person did not want you to do so." Response categories included everyday/almost every day, once or twice a week, once or twice a month, a few times a year, less than a few times a year, and never.

Technology-based sexual harassment/solicitation. Youth were asked questions about the perpetration of sexually harassing and solicitous behavior online and over cell phone text messaging. To replicate the Youth Internet Safety Surveys (YISS) [Finkelhor et al., 2000; Wolak et al., 2006], three behaviors were queried: (a) Tried to get someone else to talk about sex online when they did not want to do so; (b) Asked anyone online for sexual information about themselves when that person did not want to tell me—really personal questions, like what his or her body looks like, or sexual things he or she has done; or (c) Asked anyone to do something sexual online when the other person did not want to do so. Two additional questions based upon the YISS questions were developed about messages youth sent using text messaging: (a) Sent a text message that was sexual in any way when that person did not want to receive it; and (b) Sent a picture text message that was sexual in any way when that person did not want to receive it. Response categories included everyday/almost every day, once or twice a week, once or twice a month, a few times a year, less than a few times a year, and never. Strong inter-correlation among the five items was observed (Cronbach's α Wave 1 (baseline) = 0.87; Wave 2 (12-month follow-up) = 0.95; Wave 3 (24-month follow-up) = 0.85).

Intentional Exposure to X-rated Material

Because of the potentially ambiguous meanings of "sexual material" or "pornography", "x-rated material" was the chosen definition for the exposure variable. Youth were asked about exposure to x-rated material in three different mediums: (a) Have you watched an x-rated movie at a friend's house, your house, or in the theatre where the main topic was sex?; (b) Have you looked at an x-rated magazine, like Playboy, on purpose where you knew that the main topic was sex?; and (c) Have you gone to or seen an x-rated or "adult" website where the main topic is sex? Positive responses to these items were followed up with questions asked about exposure to violent x-rated material specific to the medium reported: (a) Have you seen a movie that showed a person being physically hurt by another person while they were doing something sexual?; (b) Have you ever looked at a magazine that showed a person being physically hurt by another person while they were doing something sexual?; and (c) When you have gone to or seen an x-rated or adult website, have you ever seen a person being physically hurt by another person while they were doing something sexual?[2] All responses were captured on a dichotomous (yes/no) scale.

Potentially Influential Characteristics

It is possible that an observed association between x-rated material and sexually aggressive behaviour among young people is a spurious relationship driven by some underlying characteristic related to both the variables. For example, perhaps an individual with a higher propensity to respond to stimuli with anger is both more likely to act aggressively toward people and to consume violent media, including x-rated material. It is possible that one's propensity to respond to stimuli in a specific way rather than the exposure to x-rated material that is driving the behaviour in this case. To control for possible third-variable influences on the observed association between x-rated material and sexual aggression, we include in the analyses characteristics established in the literature as being related to sexual aggression [de Bruijn et al., 2006; Krahe, 1998; Lacasse and Mendelson, 2007; Maxwell et al., 2003; Ozer et al., 2004].

Proximal Characteristics Other than X-rated Material

Sexual victimization is a noted proximal risk factor for sexual aggression among boys [Casey and Lindhorst, 2009; Hickey et al., 2008; Seto and Lalumière, 2010]. In this study, victims of sexual harassment/solicitation online and via text messaging were identified using the three items referenced in the above section [Finkelhor et al., 2000; Wolak et al., 2006], reworded to refer to victimization (e.g., have you ever been asked to talk about sex online when you did not want to) online as well as via text messaging.

[2]Although this definition of violent x-rated material includes some of what has been typically been included within the definition of sexually violent pornography, it excludes some content such as x-rated material that involves coercion but not physical injury (e.g., to get a person to engage in sexual behaviors against their will without injury being depicted).

Distal Characteristics

One's propensity to respond to stimuli with anger was measured using the 10-item State-Trait Anger Expression Inventory (STAXI-CA) T-Anger scale (Cronbach's α Wave 1 (baseline) = 0.85; Wave 2 (12-month follow up): 0.88; Wave 3 (24-month follow-up) 0.87; [Forgays et al., 1997; Spielberger et al., 2004]. Response options were captured on a 3-point Likert scale (1 [hardly ever true], 2 [sometimes true], 3 [often true]).

Offline generalized aggressive behavior was assessed using a factor score of six different behaviors [Centers for Disease Control and Prevention, 2005]: (a) Shoved, or pushed, or hit or slapped another person of your age, (b) Threatened to hurt a teacher, (c) Been in a fight in which someone including yourself was hit, (d) Gotten into a fight where a group of your friends were against another group of people, (e) Excluded someone from your group, and (f) Spread a rumor about someone. Factors were estimated using iterative principal components analysis [StataCorp, 2009]. Eigenvalues for each Wave were above 1 (Wave 1 = 2.36; Wave 2 = 2.57; Wave 3 = 2.40). Responses were captured on a 6-point Likert scale ranging from 1 (every day/almost every day) to 6 (never). Items were reverse coded such that higher factor scores indicated greater levels of aggressive behavior.

Witnessing family violence was indicated using a modified question from the Juvenile Victimization Questionnaire (JVQ): ever, in real life, have you "seen one of your parents get hit, slapped, punched, or beat up by your other parent, or their boyfriend or girlfriend?" [Finkelhor et al., 2005]. Responses were captured on a dichotomous (yes/no) scale.

Youth provided estimates of academic achievement (i.e., "Mostly A's, Mostly D and F's"). Connectedness to parents or caregivers was reflected in the youth's rated emotional closeness with their caregiver. This measure is a composite score derived from three items from the Youth Internet Safety Survey, each measured on a 5-point Likert scale [Finkelhor et al., 2000]: (a) How well would you say you and this person get along?; (b) Do you feel that your caregiver trusts you?; and (c) If you were in trouble or were sad would you discuss it with this person? (Cronbach's α Wave 1 (baseline) = 0.62; Wave 2 (12-month follow up) = 0.66; 24-month follow up = 0.70). Alcohol and drug use was assessed via dichotomous (yes/no) response items based upon those in the Youth Risk Behavior Survey [Centers for Disease Control and Prevention, 2006] measuring use of four substances (alcohol, marijuana, inhalants, "all other drugs"). This was converted to a factor score using iterative principal components (Eigenvalues for Wave 1 = 1.83; Wave 2 = 1.60; Wave 3 = 1.48).

Youth reported their media use online and via cell phones. Use was captured for the amount of use in a typical week (0 days to 7 days) and intensity of use on a typical day (0 min to more than 3 hr). Four indicators of average daily and weekly use of the Internet and cell phones were factor analyzed and reduced to a factor score (Eigenvalues for Wave 1 = 1.88; Wave 2 = 1.72; Wave 3 = 1.65). Finally, youth reported their race and ethnicity, while caregivers reported youths' sex and age.

Statistical Analyses

Data were weighted statistically to reflect the population of adults with children aged 10–15 years in the US according to adult age, sex, race/ethnicity, region, education, household income, and child age and sex [Bureau of Labor Statistics and the Bureau of the Census, 2001]. Next, survey sampling weights were applied to adjust for adult respondents' self-selection into the internet-using population and the Harris Poll OnLine [Berrens et al., 2003, 2004; Schonau et al., 2004; Terhanian et al., 2001]. HPOL data are consistently comparable to data that have been obtained from random telephone samples of general populations after sampling and weighting are applied [Berrens et al., 2003, 2004; Schonau et al., 2004; Terhanian et al., 2001]. Third, missing data and "refused" responses were imputed using best-set regression [StataCorp, 2009], which imputes data based on the best available subset of specified predictors. To determine the best subset, all different subsets of the specified predictors are used in separate regression analyses to predict the outcome variable, or the variable being imputed; the best, i.e., most predictive, subset of predictors, is then used to impute the missing values of the variable being imputed. To reduce the likelihood of imputing variables for truly nonresponsive youth, participants were required to have valid data for at least 85% of the survey questions asked of all youth. Eleven respondents did not meet this criterion and were dropped from the Wave 1 (baseline) sample; 17 were dropped in the 12-month follow-up and 10 from the Wave 3 (24-month follow-up) samples. Participants excluded from a Wave because of missing data were not necessarily excluded from subsequent waves. Thus, 3,915 observations from 1,583 respondents are included.

At the end of the survey, participants were asked whether they completed the survey in a room where they were alone or with other people in the room. They also were asked to rate on a 5-point Likert scale how much they agreed or disagreed with the following statement: I answered the questions in this survey honestly. An indicator of those who somewhat or strongly disagreed (on average, 3.3% across the three Waves) versus all others, as well as an indicator of whether the youth was alone (on average, 41.9% across the three Waves) versus not when completing the survey, were included in all multivariable analyses irrespective of statistical significance.

Percentages reported in the text and tables are weighted using the methodology described above; numbers reflect the actual sample composition [StataCorp, 2009].

A marginal model with generalized estimating equations (GEE) was used to represent the population-average odds of sexually aggressive behavior as a function of exposure to x-rated material over the 36-month period and to account for clustering in the data within person over time. The resulting odds ratios reflect the relative odds of reporting sexually aggressive behavior on average over time given the average change in exposure to sexual material over time. Marginal models treat time as a within-units (i.e., person) factor and cluster on the individual. The models were estimated assuming an unstructured correlation matrix with robust standard errors.

The following testing approach was used to examine the study questions: (1), variables for x-rated material were entered into the model, along with the process variables indicating Wave of the study, self-reported dishonesty and not being alone when completing the survey; (2) the proximal variable of sexual aggression victimization was entered into the model; (3) the distal variables of generalized aggression (e.g., propensity to respond to stimuli with anger) were entered into the model (4) the distal psychosocial indicators (e.g., substance use and poor academic performance) were entered; and (5) the more distal variables, demographic characteristics, and technology use factors, were entered into the model. The resulting odds ratios reflected the association between x-rated material and sexually aggressive behavior holding all these other factors equal.

Next, the above process was followed in a subsequent GEE analysis in order to determine whether the type of x-rated material (i.e., violent or non-violent) affect a possible association with sexually aggressive behavior. All analyses also were stratified by biological sex to investigate differences in associations.

RESULTS

Prevalence Rates of Sexually Aggressive Behavior and X-rated Material Consumption

Four percent of youth reported sexually aggressive behavior in the past 12 months at Wave 1 and Wave 2 each, and 6% at Wave 3. As shown in Table I, almost all characteristics examined were significantly related to sexually aggressive behavior at the bi-variate level. Of particular note, youth reporting being frequent victims of sexual violence online or via text messaging were 32 times more likely to report sexually aggressive behavior compared to nonvictims (95%: CI: 18.5, 55.2; $P < .001$). Exposure to violence in the family among caregivers was also strongly related to the report of sexually aggressive behavior (OR = 4.2, 95% CI: 2.3, 7.5; $P < .001$).

Nineteen percent of youth reported exposure to x-rated material in the past 12 months at Wave 1, 27% at Wave 2, and 22% at Wave 3. By mode, 14% reported exposure to x-rated movies, 12% to x-rated magazines, and 11% to x-rated websites. Fewer than 5% reported exposure to violent x-rated material in any wave. On average, violent x-rated material was accessed in magazines by 1% of youth, online by 1% of youth, and in movies by 3% of youth. Personal characteristics based upon the report of intentional exposure to x-rated material across Waves are reported in Table II.

Associations Between X-rated Material and Sexual Aggression

Youth who reported exposure to x-rated material were 6.5 times (95% CI: 4.0, 10.6) more likely to report sexually aggressive behavior over the 36-months (Table III).

Associations above and beyond other influential factors. Controlling for sexual aggression victimization (online and via text messaging), the longitudinal relationship between x-rated material exposure and sexual aggression was greatly attenuated (aOR = 3.5, 9% CI: 2.2, 5.5). When the association was further adjusted for the distal factors of aggression (i.e., relational and physical bullying perpetration, getting into fights, responding to stimuli with anger, exposure to spousal abuse in the home) and psychosocial indicators (i.e., drug use, poor academic performance, poor emotional

TABLE I. A Comparison of Personal Characteristics of Perpetrators and Nonperpetrators of Sexual Aggression

	Wave 1		Wave 2 (12-month follow-up)		Wave 3 (24-month follow-up)		Statistical comparison
	No sexually aggressive behavior	Sexually aggressive behavior	No sexually aggressive behavior	Sexually aggressive behavior	No sexually aggressive behavior	Sexually aggressive behavior	Population average odds of sexually aggressive behavior vs. not (Odds Ratio)
	96% (1,510)	4% (67)	96% (1,138)	4% (51)	94% (1,091)	6% (58)	
Youth characteristics	% (*n*)	% (*n*)	% (*n*)	% (*n*)	% (*n*)	% (*n*)	
Sexual violence victimization (online)							
None	87% (1316)	28% (23)	85% (975)	25% (19)	81% (875)	29% (19)	1.0 (ref)
Sometimes	11% (163)	29% (22)	11% (125)	39% (13)	15% (175)	36% (18)	8.4***
Monthly or more often	2% (31)	43% (22)	4% (38)	35% (19)	4% (41)	35% (21)	31.9***
Indicators of aggression							
Propensity to respond to stimuli with anger[a]	18.5 (0.16)	21.5 (0.83)	18.7 (0.20)	20.9 (0.91)	18.6 (0.19)	21.6 (0.89)	1.1***
Generalized aggressive behavior[b]	−0.092 (0.022)	1.7 (0.34)	−0.078 (0.030)	1.4 (0.35)	−0.049 (0.033)	1.4 (0.22)	2.4***
Psychosocial challenge							
Poor academic achievement[c]	9% (141)	12% (9)	12% (127)	26% (16)	10% (108)	23% (14)	1.9*
Family challenge							
Emotional connectedness with caregiver[d]	5.4 (0.070)	7.1 (0.39)	5.5 (0.086)	6.9 (0.41)	5.6 (0.094)	7.1 (0.43)	1.3***
Exposure to spousal violence in the family	9% (126)	25% (17)	3% (34)	10% (7)	4% (37)	24% (12)	4.2***
Substance use[e]	−0.035 (0.026)	1.5 (0.51)	0.0052 (0.038)	0.74 (0.24)	−0.022 (0.036)	0.79 (0.20)	1.6***
Demographic characteristics							
Male	49% (761)	42% (31)	50% (567)	55% (33)	49% (550)	52% (31)	0.98
Age[f]	12.5 (0.048)	13.2 (0.18)	13.7 (0.054)	14.2 (0.22)	14.5 (0.056)	14.9 (0.19)	1.2**
Race							
White	71% (1108)	70% (47)	74% (864)	79% (36)	73% (817)	62% (38)	1.0 (ref)
Black	14% (202)	10% (11)	12% (132)	13% (8)	13% (134)	17% (11)	1.0
Mixed	8% (108)	13% (5)	8% (76)	4% (4)	8% (79)	13% (5)	1.6
All other	7% (92)	7% (4)	6% (66)	5% (3)	6% (61)	7% (4)	1.2
Hispanic ethnicity	18% (198)	23% (8)	17% (137)	17% (7)	16% (126)	28% (11)	1.6
Media use[g]	−0.058 (0.029)	0.75 (0.17)	−0.013 (0.035)	0.27 (0.22)	−0.031 (0.036)	0.41 (0.13)	1.8***

All characteristics were tested for statistically significant differences by sexually aggressive behavior across Waves. There were not statistically significantly differences for any characteristic when comparing either Wave 2 or Wave 3 to Wave 1.WaveWave. ref, reference group.

[a]State-Trait Anger Expression Inventory (STAXI-CA) T-Anger scale. Potential range was: 10–30 with higher score reflecting a greater propensity to react to stimuli with anger.

[b]Factor score. Potential range was: −9.2 to 0.64. Higher scores reflected more aggressive behaviors.

[c]Dichotomous measure comparing youth reporting "mostly C's" and lower versus all else.

[d]Potential range was: 3–14 with higher scores reflecting more negative ratings by child of relationship with parent or guardian.

[e]Factor score. Potential range was: −0.38 to 7.7. A higher score reflected more substance using.

[f]Age ranged from 9 to 18 years.

[g]Factor score. Potential range was: −1.5 to 2.7. A higher score reflected more media use.

*$P \leq .05$; **$P \leq .01$; ***$P \leq .001$.

TABLE II. Characteristics of Youth Based Upon Exposure to No, Nonviolent, or Violent X-rated Material in the Previous Year

	Wave 1			Wave 2 (12-month follow-up)			Wave 3 (Wave 3 (24-month follow-up))		
	No exposure to x-rated material	Exposure to nonviolent x-rated material	Exposure to violent x-rated material	No exposure to x-rated material	Exposure to nonviolent x-rated material	Exposure to violent x-rated material	No exposure to x-rated material	Exposure to nonviolent x-rated material	Exposure to violent x-rated material
	81% (1,276)	14% (227)	5% (74)	73% (864)	24% (282)	3% (43)	78% (882)	18% (219)	4% (48)
Youth characteristics	% (*n*)	% (*n*)	% (*n*)	% (*n*)	% (*n*)	% (*n*)	% (*n*)	% (*n*)	% (*n*)
Sexual violence victimization (online)									
None	89% (1,140)	72% (166)	39% (33)	89% (776)	68% (194)	44% (24)	84% (733)	60% (139)	51% (22)
Sometimes	9% (116)	19% (45)	31% (24)	8% (69)	22% (62)	21% (7)	13% (118)	30% (64)	15% (11)
Monthly or more often	2% (20)	9% (16)	30% (17)	3% (19)	10% (26)	36% (12)	3% (31)	10% (16)	33% (15)
Indicators of aggression									
Propensity to respond to stimuli with anger[a]	18.4 (0.18)	19.3 (0.38)	20.0 (0.75)	18.3 (0.21)	19.9 (0.44)	21.2 (0.99)	18.5 (0.20)	19.7 (0.52)	20.5 (0.87)
Generalized aggressive behavior[b]	−0.14 (0.023)	0.21 (0.066)	1.4 (0.34)	−0.14 (0.034)	0.20 (0.074)	1.2 (0.31)	−0.080 (0.037)	0.27 (0.081)	1.1 (0.29)
Psychosocial challenge									
Poor academic achievement[c]	9% (108)	11% (30)	15% (12)	10% (72)	21% (60)	26% (11)	8% (66)	22% (44)	27% (12)
Family challenge									
Emotional connectedness with caregiver[d]	5.3 (0.076)	5.9 (0.17)	6.7 (0.45)	5.4 (0.093)	6.1 (0.19)	7.0 (0.44)	5.5 (0.10)	6.2 (0.24)	6.6 (0.42)
Exposure to spousal violence in the family	8% (99)	12% (21)	31% (23)	3% (19)	4% (15)	13% (7)	5% (31)	6% (10)	20% (8)
Substance use[e]	−0.085 (0.027)	0.37 (0.15)	1.01 (0.33)	−0.16 (0.029)	0.51 (0.12)	0.93 (0.26)	−0.14 (0.036)	0.57 (0.097)	0.61 (0.23)
Demographic characteristics									
Male	46% (591)	67% (160)	50% (41)	44% (384)	65% (191)	62% (25)	43% (388)	70% (157)	78% (36)
Age[f]	12.4 (0.052)	13.2 (0.12)	13.3 (0.18)	13.5 (0.061)	14.4 (0.10)	13.8 (0.26)	14.3 (0.063)	15.3 (0.10)	14.8 (0.26)
Race									
White	72% (939)	70% (169)	66% (47)	74% (659)	74% (213)	68% (28)	72% (658)	77% (167)	55% (30)
Black	13% (167)	19% (34)	10% (12)	12% (99)	14% (34)	11% (7)	13% (104)	16% (33)	16% (8)
Mixed	8% (91)	9% (15)	11% (7)	7% (53)	9% (24)	4% (3)	9% (65)	6% (13)	14% (6)
All other	7% (79)	2% (9)	14% (8)	7% (53)	3% (11)	17% (5)	6% (55)	2% (6)	16% (4)
Hispanic ethnicity	17% (163)	19% (28)	35% (15)	16% (101)	19% (36)	21% (7)	15% (100)	24% (31)	20% (6)
Media use (mean: SE)[g]	−0.98 (0.032)	0.25 (0.083)	0.43 (0.16)	−0.086 (0.038)	0.22 (0.081)	0.29 (0.18)	−0.062 (0.039)	0.24 (0.079)	−0.083 (0.15)

[a]State-Trait Anger Expression Inventory (STAXI-CA) T-Anger scale. Potential range was: 10–30 with higher score reflecting a greater propensity to react to stimuli with anger.
[b]Factor score. Potential range was: −9.2 to 0.64. Higher scores reflected more aggressive behaviors.
[c]Dichotomous measure comparing youth reporting "mostly C's" and lower versus all else.
[d]Potential range was: 3–14 with higher scores reflecting more negative ratings by child of relationship with parent or guardian.
[e]Factor score. Potential range was: −0.38 to 7.7. A higher score reflected more substance using.
[f]Age ranged from 9 to 18 years.
[g]Factor score. Potential range was: −1.5 to 2.7. A higher score reflected more media use.

TABLE III. Summary of Step-wise Population Averaged Logistic Regression Analysis for Variables Predicting Sexually Aggressive Behavior—Any X-rated Material Exposure (Observations = 3,915; $N = 1,577$)

Variable	*B*	Semi-robust SE	Odds ratio	95% CI for OR
Step 1				
Any exposure to x-rated material	1.9	0.25	6.5***	4.0–10.6
Time				
Wave 1 (baseline)			1.0 (ref)	
Wave 2 (12-month follow-up)	−0.23	0.27	0.79	0.47–1.3
Wave 3 (24-month follow-up)	0.20	0.26	1.2	0.73–2.0
Process variables				
Self-reported dishonesty in answering questions	0.62	0.35	1.9	0.93–3.7
Having someone in the room while doing the survey	−0.20	0.26	0.82	0.49–1.4
Step 2				
Any exposure to x-rated material	1.3	0.23	3.5***	2.2–5.5
Time				
Wave 1 (baseline)			1.0 (ref)	
Wave 2 (12-month follow-up)	−0.30	0.29	0.74	0.42–1.3
Wave 3 (24-month follow-up)	0.051	0.27	1.1	0.63–1.8
Process variables				
Self-reported dishonesty in answering questions	0.38	0.34	1.5	0.75–2.9
Having someone in the room while doing the survey	−0.14	0.26	0.87	0.52–1.5
Sexual violence victimization (online)				
None			1.0 (ref)	
Sometimes	1.9	0.26	6.4***	3.9–10.6
Monthly or more often	3.0	0.29	20.0***	11.4–35.2
Step 3				
Any exposure to x-rated material	1.1	0.24	2.9***	1.8–4.7
Time				
Wave 1 (baseline)			1.0 (ref)	
Wave 2 (12-month follow-up)	−0.27	0.32	0.77	0.41–1.4
Wave 3 (24-month follow-up)	0.068	0.28	1.1	0.61–1.9
Process variables				
Self-reported dishonesty in answering questions	−0.23	0.49	0.79	0.30–2.1
Having someone in the room while doing the survey	−0.074	0.27	0.93	0.55–1.6
Sexual violence victimization (online)				
None			1.0 (ref)	
Sometimes	1.6	0.27	5.0***	2.9–8.6
Monthly or more often	2.2	0.30	9.3***	5.1–16.9
Indicator of aggression				
Propensity to respond to stimuli with anger	0.058	0.030	1.1	1.0–1.1
Generalized aggressive behavior	0.53	0.087	1.7***	1.4–2.0
Exposure to spousal violence in the family	0.42	0.38	1.5	0.72–3.2
Step 4				
Any exposure to x-rated material	0.98	0.24	2.7***	1.6–4.3
Time				
Wave 1 (baseline)			1.0 (ref)	
Wave 2 (12-month follow-up)	−0.27	0.33	0.77	0.40–1.5
Wave 3 (24-month follow-up)	0.042	0.28	1.04	0.60–1.8
Process variables				
Self-reported dishonesty in answering questions	−0.15	0.50	0.86	0.32–2.3
Having someone in the room while doing the survey	−0.046	0.27	0.96	0.57–1.6
Sexual violence victimization (online)				
None			1.0 (ref)	
Sometimes	1.6	0.28	4.9***	2.8–8.4
Monthly or more often	2.2	0.30	8.8***	4.9–15.7
Indicator of aggression				
Propensity to respond to stimuli with anger	0.032	0.031	1.03	0.97–1.1
Generalized aggressive behavior	0.48	0.086	1.6***	1.4–1.9
Psychosocial challenge				
Poor academic achievement	−0.077	0.31	0.93	0.51–1.7
Emotional connectedness with caregiver	0.13	0.054	1.1*	1.02–1.3
Exposure to spousal violence in the family	0.31	0.37	1.4	0.65–2.8
Substance use	0.15	0.091	1.2	0.98–1.4

TABLE III. Continued

Variable	*B*	Semi-robust SE	Odds ratio	95% CI for OR
Step 5				
Any exposure to x-rated material	0.88	0.26	2.4***	1.5–4.0
Time				
Wave 1 (baseline)			1.0 (ref)	
Wave 2 (12-month follow-up)	−0.28	0.34	0.75	0.39–1.5
Wave 3 (24-month follow-up)	0.0055	0.30	1.01	0.56–1.8
Process variables				
Self-reported dishonesty in answering questions	−0.14	0.47	0.87	0.35–2.2
Having someone in the room while doing the survey	−0.063	0.26	0.94	0.56–1.6
Sexual violence victimization (online)				
None			1.0 (ref)	
Sometimes	1.6	0.28	4.9***	2.8–8.4
Monthly or more often	2.2	0.31	9.0***	4.9–16.3
Indicator of aggression				
Propensity to respond to stimuli with anger	0.035	0.030	1.04	0.98–1.1
Generalized aggressive behavior	0.50	0.088	1.7***	1.4–1.96
Psychosocial challenge				
Poor academic achievement	−0.15	0.31	0.86	0.47–1.6
Emotional connectedness with caregiver	0.13	0.054	1.1*	1.02–1.3
Exposure to spousal violence in the family	0.33	0.37	1.4	0.67–2.9
Substance use	0.15	0.090	1.2	0.97–1.4
Demographics				
Male youth	0.38	0.26	1.5	0.87–2.4
Age	0.024	0.074	1.02	0.89–1.2
Race				
White			1.0 (ref)	
Black	−0.12	0.36	0.89	0.44–1.8
Mixed	0.051	0.41	1.1	0.47–2.4
All other	−0.59	0.54	0.56	0.19–1.6
Hispanic ethnicity	0.30	0.29	1.4	0.77–2.4
Media use	0.086	0.14	1.1	0.82–1.4

Wald $\chi^2(5) = 84.9$ for Step 1; Wald $\chi^2(7) = 190.3$ for Step 2 ($P > \chi^2 = .000$); Wald $\chi^2(10) = 216.5$ for Step 3 ($P > \chi^2 = .000$); Wald $\chi^2(13) = 229.0$ for Step 4 ($P > \chi^2 = .000$); Wald $\chi^2(20) = 271.9$ for Step 5 ($P > \chi^2 = .000$). ref, reference group.
***$P \leq .001$; **$P \leq .01$; *$P \leq .05$.

bond with caregiver, and victimization of sexual aggression online and via text message), the relative odds of reporting sexually aggressive perpetration given exposure to x-rated material over the 36-months was attenuated further but the relationship remained statistically significant (aOR = 2.7, 95% CI: 1.7, 4.3). The inclusion of demographic characteristics and media use did little to the observed association; after adjusting for all other influential characteristics, youth reporting exposure to x-rated material were twice as likely (aOR = 2.4, 95% CI: 1.5, 4.0) to report sexually aggressive behavior in the past year over the 36-month period.

Violence in x-rated material. Subsequent analyses were conducted to examine the relative influence of violent versus nonviolent x-rated material in explaining the odds of sexually aggressive behavior (see Table IV). Youth reporting exposure to nonviolent x-rated material were more than three times as likely (OR = 3.7, 95% CI: 2.2, 6.3), and youth reporting exposure to violent x-rated material were 24 times as likely (OR = 24.6, 95% CI: 14.0, 41.3), to report sexually aggressive behavior compared to youth reporting no exposure to x-rated material in the past year. Results suggest that sexual aggression victimization (online and via text messaging), attenuated the relationships between nonviolent (aOR = 2.3, 95% CI: 1.4, 3.8) and violent (aOR = 9.9, 95% CI: 5.6, 17.7) x-rated material consumption with sexually aggressive behavior. The inclusion of distal factors, specifically indications of aggression and psychosocial challenges, in the population average logistic regression model further attenuated the observed association between nonviolent x-rated material and sexual aggression (aOR = 1.9, 95% CI: 1.1, 3.3) but not for violent x-rated material and sexual aggression (aOR = 6.0, 95% CI: 3.4, 10.7). Demographic characteristics did little to change the observed associations. Among otherwise similar youth, those reporting exposure to violent x-rated material were on average 5.8 times as

TABLE IV. Summary of Step-wise Population Averaged Logistic Regression Analysis for Variables Predicting Sexually Aggressive Behavior—Violent X-rated Material Exposures (Observations = 3,915; $N = 1,577$)

Variable	*B*	Semi-robust SE	Odds ratio	95% CI for OR
Step 1				
Exposure to x-rated material				
None			1.0 (ref)	
Nonviolent x-rated material	1.3	0.28	3.6***	2.1–6.3
Violent x-rated material	3.2	0.27	24.6***	14.5–41.9
Time				
Wave 1 (baseline)			1.0 (ref)	
Wave 2 (12-month follow-up)	−0.057	0.27	0.94	0.56–1.6
Wave 3 (24-month follow-up)	0.30	0.27	1.4	0.81–2.3
Process variables				
Self-reported dishonesty in answering questions	0.40	0.33	1.5	0.78–2.8
Having someone in the room while doing the survey	−0.28	0.26	0.76	0.45–1.3
Step 2				
Exposure to x-rated material				
None			1.0 (ref)	
Nonviolent x-rated material	0.83	0.26	2.3***	1.4–3.8
Violent x-rated material	2.3	0.29	9.9 ***	5.6–17.7
Time				
Wave 1 (baseline)			1.0 (ref)	
Wave 2 (12-month follow-up)	−0.13	0.30	0.87	0.49–1.6
Wave 3 (24-month follow-up)	0.18	0.27	1.2	0.71–2.0
Process variables				
Self-reported dishonesty in answering questions	0.20	0.33	1.2	0.64–2.3
Having someone in the room while doing the survey	−0.16	0.26	0.85	0.51–1.4
Sexual violence victimization (online)				
None			1.0 (ref)	
Sometimes	1.8	0.26	6.3***	3.8–10.6
Monthly or more often	2.8	0.31	16.4***	8.9–30.0
Step 3				
Exposure to x-rated material				
None			1.0 (ref)	
Nonviolent x-rated material	0.75	0.27	2.1**	1.2–3.6
Violent x-rated material	1.9	0.29	6.6***	3.7–11.8
Time				
Wave 1 (baseline)			1.0 (ref)	
Wave 2 (12-month follow-up)	−0.18	0.33	0.83	0.44–1.6
Wave 3 (24-month follow-up)	0.14	0.29	1.2	0.66–2.0
Process variables				
Self-reported dishonesty in answering questions	−0.49	0.46	0.61	0.25–1.5
Having someone in the room while doing the survey	−0.10	0.27	0.91	0.54–1.5
Sexual violence victimization (online)				
None			1.0 (ref)	
Sometimes	1.6	0.28	5.1***	3.0–8.8
Monthly or more often	2.2	0.32	8.6***	4.6–16.2
Indicator of aggression				
Propensity to respond to stimuli with anger	0.060	0.031	1.1	1.0–1.1
Generalized aggressive behavior	0.49	0.084	1.6***	1.4–1.9
Exposure to spousal violence in the family	0.29	0.39	1.3	0.62–2.9
Step 4				
Exposure to x-rated material				
None			1.0 (ref)	
Nonviolent x-rated material	0.64	0.28	1.9*	1.1–3.3
Violent x-rated material	1.8	0.30	6.0***	3.4–10.7
Time				
Wave 1 (baseline)			1.0 (ref)	
Wave 2 (12-month follow-up)	−0.18	0.33	0.84	0.44–1.6
Wave 3 (24-month follow-up)	0.12	0.29	1.1	0.64–2.0

TABLE IV. Continued

Variable	*B*	Semi-robust SE	Odds ratio	95% CI for OR
Process variables				
Self-reported dishonesty in answering questions	−0.40	0.48	0.67	0.26–1.7
Having someone in the room while doing the survey	−0.062	0.27	0.94	0.56–1.6
Sexual violence victimization (online)				
None			1.0 (ref)	
Sometimes	1.6	0.28	4.9***	2.8–8.5
Monthly or more often	2.1	0.31	8.2***	4.5–14.9
Indicator of aggression				
Propensity to respond to stimuli with anger	0.033	0.031	1.03	0.97–1.1
Generalized aggressive behavior	0.44	0.083	1.6***	1.3–1.8
Psychosocial challenge				
Poor academic achievement	−0.055	0.30	0.95	0.52–1.7
Emotional connectedness with caregiver	0.12	0.055	1.1*	1.01–1.3
Exposure to spousal violence in the family	0.20	0.38	1.2	0.58–2.6
Substance use	0.16	0.094	1.2	0.98–1.4
Step 5				
Exposure to x-rated material				
None			1.0 (ref)	
Nonviolent x-rated material	0.51	0.29	1.7	0.94–2.9
Violent x-rated material	1.8	0.30	5.8***	3.2–10.5
Time				
Wave 1 (baseline)			1.0 (ref)	
Wave 2 (12-month follow-up)	−0.18	0.34	0.84	0.43–1.6
Wave 3 (24-month follow-up)	0.090	0.30	1.1	0.60–2.0
Process variables				
Self-reported dishonesty in answering questions	−0.32	0.42	0.72	0.32–1.6
Having someone in the room while doing the survey	−0.059	0.26	0.94	0.57–1.6
Sexual violence victimization (online)				
None			1.0 (ref)	
Sometimes	1.6	0.28	4.8***	2.7–8.3
Monthly or more often	2.1	0.31	8.1***	4.4–14.9
Indicator of aggression				
Propensity to respond to stimuli with anger	0.035	0.030	1.04	0.98–1.1
Generalized aggressive behavior	0.47	0.086	1.6***	1.4–1.9
Psychosocial challenge				
Poor academic achievement	−0.094	0.30	0.91	0.51–1.6
Emotional connectedness with caregiver	0.12	0.054	1.1*	1.02–1.3
Exposure to spousal violence in the family	0.20	0.38	1.2	0.58–2.6
Substance use	0.15	0.093	1.2	0.97–1.4
Demographics				
Male youth	0.37	0.26	1.4	0.87–2.4
Age	0.03	0.074	1.03	0.89–1.2
Race				
White			1.0 (ref)	
Black	−0.068	0.36	0.93	0.47–1.9
Mixed	0.039	0.41	1.04	0.47–2.3
All other	−0.98	0.60	0.37	0.11–1.2
Hispanic ethnicity	0.34	0.29	1.4	0.79–2.5
Media use	0.11	0.14	1.1	0.85–1.5

Wald $\chi^2(6) = 163.6$ for Step 1; Wald $\chi^2(8) = 217.4$ for Step 2 ($P > \chi^2 = .000$); Wald $\chi^2(11) = 225.4$ for Step 3 ($P > \chi^2 = .000$); Wald $\chi^2(14) = 242.5$ for Step 4 ($P > \chi^2 = .000$); Wald $\chi^2(21) = 288.1$ for Step 5 ($P > \chi^2 = .000$). ref, reference group.
***$P \leq .001$; **$P \leq .01$; *$P \leq .05$.

likely to report sexually aggressive behavior over time (95% CI: 3.2, 10.5), whereas those reporting exposure to nonviolent x-rated material statistically similarly likely to youth reporting no exposure to x-rated material to report sexually aggressive behavior (aOR = 1.7, 95% CI: 0.94, 2.9).

Differences by medium. Three different mediums of x-rated material consumption were assessed in three separate population averaged logistic regression models: internet, movies, and magazines. Among otherwise similar youth, those reporting consumption of x-rated materials online (nonviolent x-rated

material aOR = 2.3, 95% CI: 1.2, 4.2; violent x-rated material aOR = 8.4, 95% CI: 3.4, 20.9) were significantly more likely to report sexually aggressive behavior over time than youth reporting no consumption of x-rated material online, even after adjusting for other potentially influential characteristics. Watching violent x-rated movies over the 36-month period were associated with significantly elevated odds of sexually aggressive behavior (aOR = 5.1, 95% CI: 2.6, 9.9) but nonviolent x-rated material was not (aOR = 1.4, 95% CI: 0.8, 2.8) among otherwise similar youth reporting no consumption of x-rated material in movies. Consumers of x-rated material via magazines were two (nonviolent: aOR = 2.0, 95% CI: 1.2, 3.3) to three (violent: aOR = 2.7, 95% CI: 1.0, 7.2) times more likely to report sexually aggressive behavior over time compared to nonconsumers. Tables detailing these analyses are available upon request.

Differences by biological sex. Fifteen percent of females and 30% of males reported exposure to x-rated material (F (1, 1,579) = 38.8, $P < .001$). The association between sexually aggressive behavior and exposure to x-rated material over time, adjusting for other influential factors, was examined separately for boys and girls. Results were similar as demonstrated by the overlapping 95% confidence intervals (boys nonviolent x-rated material aOR = 2.0, 95% CI: 0.8, 4.7 and girls nonviolent x-rated material aOR = 1.2, 95% CI: 0.5, 3.2; boys violent x-rated material aOR = 6.5, 95% CI: 2.7, 15.3; and girls violet x-rated material aOR = 6.1, 95% CI: 2.5, 14.8; table available upon request).

DISCUSSION

Among the 10–15 year old respondents surveyed nationally in the Growing up with Media study, self-reports of intentional exposure to x-rated violent material are associated with significantly higher odds of reporting perpetration of sexually aggressive behavior. This association remains significant even after a range of known risk factors including generalized aggressive behavior, alcohol and drug use, and witnessing parental violence, are considered. Findings add to the growing literature suggesting that x-rated violent material may have an impact on adolescent behavior [Brown and L'Engle, 2009; Chandra et al., 2008; Tolman et al., 2007].

Importantly, the relationship between x-rated material and sexually aggressive behavior appears to be driven by the violent content of the x-rated material. When violent and nonviolent x-rated material are examined separately, consumers of violent x-rated material are almost six times more likely than nonconsumers of violent x-rated material to report sexually aggressive behavior over the 36-month period. In contrast, consumers of nonviolent x-rated material are statistically equally likely to report sexually aggressive behavior compared to those who report no consumption of nonviolent x-rated material. This finding is consistent with the adult literature suggesting that violent pornography may be particularly influential compared to nonviolent pornography [Demaré et al., 1988; Donnerstein and Linz, 1986; Linz et al., 1984]. It may be that viewing pornography that portrays sexual aggression as rewarding may reinforce an individual's own proclivity toward sexually aggressive behavior. It follows that sexual aggression would be the result of violent, but not necessarily nonviolent pornography exposure [Allen et al., 1995].

Consumption of X-rated Material Across Medium

Consumption of violent x-rated material is associated with sexually aggressive behavior whether it is online, in movies or in magazines. The magnitude of association between x-rated material and sexually aggressive behavior for those exposed online and via movies is higher than that observed for exposure through magazines. Given the overlapping 95% confidence intervals across the three mediums, it is unclear whether one medium is particularly more influential than another. It may be that increased interactivity reflected by the technology may have greater influence on behavior, as has been noted in other areas of violent media research [Anderson et al., 2007]. This is an important area of future inquiry.

General exposure to x-rated material is relatively common (23%), whereas exposure to violent x-rated material is relatively uncommon (4%) among Growing up with Media participants. This is true across all three mediums assessed. Thus, despite the sheer number of x-rated websites available online and the assumed relative ease with which youth can access them, traditional sources of x-rated material (i.e., movies and magazines) are equally common for youth who are purposefully seeking out x-rated material. This is consistent with previous research of adolescents 10–17 years of age surveyed nationally [Ybarra and Mitchell, 2005]. A singular focus on exposures from the internet is unlikely to reduce the likelihood of children's

access to pornography, including violent pornagraphy. Instead, efforts need to be aimed at the content generally rather than a source specifically.

Consumption of X-rated Material Within the Context of Youth Biological Sex

Boys and girls in this study are equally likely to report sexually aggressive behavior over the 36-month period. Almost all of the previous literature about sexual violence perpetration focuses on boys as the sexual aggressors and girls as the victims [Abbey and McAuslan, 2004; Malamuth et al., 1993; Maxwell et al., 2003; White and Smith, 2009]. In studies that include both males and females as potential perpetrators, results are conflicting; some report female sexual violence perpetration at the same or higher rates as males [Gray and Foshee, 1997; Molidor and Tolman, 1998], while others report females to be less likely to engage in sexually violent behavior than males [de Bruijn et al., 2006; Fago, 2003; Hall and Barongan, 1997]. Our data suggest at the very least that studies examining sexual violence perpetration among youth need to ask both boys and girls questions that pertain to perpetration as well as victimization experiences.

Because of the historic assumption that perpetrators are necessarily male, more research is needed to understand the characteristics of female perpetrators of sexual violence and whether they have the same or different etiological pathways to sexually aggressive behavior as males. Importantly, however, in this study, the associations between x-rated material and sexually aggressive behavior are remarkably similar when examined for boys and girls separately. Indeed, for both boys and girls, the odds of sexually aggressive behavior are more than five times higher if violent x-rated material consumption is reported. Consumption of non-violent x-rated material is not statistically significantly related to perpetration. Whether the etiology of sexual aggression differs for both boys and girls, the current findings suggest that x-rated material may have a similar influence irrespective of sex.

Sexual Violence as a Result of a Confluence of Factors

As posited, sexually aggressive behavior appears to be the result of a confluence of factors [Malamuth et al., 1993]. Sexual violence victimization, a posited proximal factor, was strongly related to sexual aggression perpetration. Indeed, youth who report being "sometimes" or less frequently victimized online or via text messaging are almost five times as likely, and those who report being victimized monthly or more often are nine times as likely to report sexually aggressive behavior than their otherwise similar, but nonvictimized peers. This is consistent with other literature that notes overlaps between victimization and perpetration, including child sexual abuse victimization predicting sexual aggression among boys [Casey and Lindhorst, 2009; Hickey et al., 2008; Seto and Lalumière, 2010].

Many of the proximal factors posited to be related to sexually aggressive behavior are supported by the data. Generalized aggressive behavior [de Bruijn et al., 2006; Lacasse and Mendelson, 2007; Ozer et al., 2004], including getting into fights, is associated with a 50% increase in odds of sexually aggressive behavior for each incremental increase in factor score, holding all other factors equal. A poor emotional bond with one's caregiver also is predictive of sexually aggressive behavior, consistent with previous work suggesting that connectedness with adults may be a protective factor for violence and deviance [Borowsky et al., 1997]. Substance use is marginally statistically significantly associated (at the $P = .10$ level) with sexually aggressive behavior after other factors are taken into account [Borowsky et al., 1997; Lacasse and Mendelson, 2007; Maxwell et al., 2003]. On the other hand, witnessing family violence [Borowsky et al., 1997], poor academic achievement [Borowsky et al., 1997], and the propensity to respond to stimuli with anger [Krahe, 1998] are each individually associated with sexually aggressive behavior, but are accounted for by other more influential factors in the multivariable models.

It also is important to point out that sexually aggressive behavior did not change significantly over the course of three years in this study of 10–15 –year olds. The rates were similar at Wave 2 compared to Wave 1, and at Wave 3 compared to Wave 1.

LIMITATIONS

The study has several limitations that should be kept in mind when interpreting the findings. Sexually aggressive behavior and purposeful exposure to x-rated material are socially undesirable behaviors and thus prevalence estimates are likely underestimates of actual behaviors. They are likely more accurate than estimates based upon criminal populations however, given that not all perpetrators are arrested nor convicted [Snyder, 2000; Snyder and Sickmund, 2006]. Although we include a measure of self-reported honesty in the models, a measure of socially desirable responding may have

been a stronger indicator. Furthermore, comparisons of exposure to x-rated material across mediums are likely reflective of true differences as there is little reason for youth to be more or less likely to report exposure in one medium versus another. Second, it is possible that caregivers monitored the child during the survey, or the child was concerned about the privacy of his or her answers for some other reason. We asked all respondents at the close of the survey whether they completed the survey alone or with other people in the room. Multivariable analyses were adjusted for self-reported honesty and whether youth were alone or not when completing the survey, even though neither was a statistically significant contributors to any model. Third, our measure of sexual violence perpetration is crude and relies on self-report. It requires the youth to be self-aware that their sexual advances are unwanted. It also should be kept in mind that the one measure could reflect a broad range of behaviors from relatively minor (e.g., unwanted kissing) to very serious (e.g., forced sexual intercourse). Fourth, it should be noted that the sample is based upon English-speaking youth and caregivers who use the internet. Findings are not generalizable to all US households who do not use the internet or who do not read English. Finally, the analyses in this study do not provide any indication of the causal direction of the relation between sexually aggressive behavior and exposure to violent x-rated material. While observational learning theory would suggest that it is the exposure to the violent x-rated material that is contributing to the risk for the sexually aggressive behavior, the alternative explanation that sexually aggressive people are more likely to watch violent x-rated material cannot be ruled out by the analyses presented in this study.

Clinical Implications

Sexually aggressive behavior in children is one of the most difficult issues faced by service providers. The current findings, along with previous research [Borowsky et al., 1997; de Bruijn et al., 2006; Krahe, 1998; Lacasse and Mendelson, 2007; Maxwell et al., 2003; Ozer et al., 2004], suggest that youth presenting with sexual aggression problems in treatment are also likely presenting with a multitude of psychosocial issues, including a poor emotional bond with their caregiver, possible spousal abuse in the home, alcohol and drug use, sexual victimization, and generalized aggression problems. It seems possible then that some youth may be in treatment for other problems that have not yet led to the identification of their sexually aggressive behavior. It is reasonable to query youth, including those as young as 10 years, presenting with general externalizing behavior problems about whether they view x-rated material, and to ask specifically about x-rated material that is depicting violence as a possible gateway into a discussion about the perpetration of sexually aggressive behavior. Also, greater attention needs to be paid to females when considering the impact of exposure on perpetration and victimization.

CONCLUSION

As one of the first studies of x-rated material and sexual aggression of children and adolescents, including those as young as 10 years of age, findings should be interpreted as suggested trends rather than conclusive population estimates. Not all youth who engage in sexually aggressive behavior consume violent x-rated material, and certainly not all youth who consume violent x-rated material engage in sexual aggression. Additionally, because data are from a community sample of children and young adolescents, low rates of sexual aggression are noted. Our findings need to be replicated. Nonetheless, the data suggest that further examination of associations between sexually aggressive behavior and consumption of violent x-rated material among children and adolescents is warranted.

ACKNOWLEDGMENTS

This survey was supported by Cooperative Agreement number U49/CE000206 from the Centers for Disease Control and Prevention (CDC). The contents of this presentation are solely the responsibility of the authors and do not necessarily represent the official views of the CDC. We also thank the entire Growing up with Media Study team from Internet Solutions for Kids, Harris Interactive, Johns Hopkins Bloomberg School of Public Health, and the CDC, who contributed to the planning and implementation of the study. We thank the families for their time and willingness to participate in this study. Finally, we thank Ms. Tonya Prescott for her tireless efforts proof reading and formatting the manuscript.

REFERENCES

Abbey A. 2005. Lessons learned and unanswered questions about sexual assault perpetration. J Interpers Violence 20:39–42.

Abbey A, McAuslan P. 2004. A longitudinal examination of male college students' perpetration of sexual assault. J Consult Clin Psychol 72:747–756.

Allen M, D'Alessio D, Brezgel K. 1995. A meta-analysis summarizing the effects of pornography. II: Aggression after exposure. Hum Commun Res 22:258–283.

Anderson CA, Gentile DA, Buckley KE. 2007. Violent Video Game Effects on Children and Adolescents: Theory, Research, and Public Policy. New York, NY: Oxford University Press.

Bandura A. 1977. Social Learning Theory. New York: General Learning Press.

Berrens RP, Bohara AK, Jenkins-Smith H, Silva C, Weimer DL. 2003. The advent of Internet surveys for political research: A comparison of telephone and Internet samples. Polit Anal 11:1–22.

Berrens RP, Bohara AK, Jenkins-Smith HC, Silva, CL, Weimer DL. 2004. Information and effort in contingent valuation surveys: Application to global climate change using national internet samples. J Environ Econ Manage 47:331–363.

Borowsky IW, Hogan M, Ireland M. 1997. Adolescent sexual aggression: Risk and protective factors. Pediatrics 100:e7.

Bross DC. 2005. Minimizing risks to children when they access the world wide web. Child Abuse Negl 29:749–752.

Brown JD, L'Engle KL. 2009. X-Rated: Sexual attitudes and behaviors associated with U.S. early adolescents' exposure to sexually explicit media. Commun Res 36:129–151.

Bureau of Labor Statistics and the Bureau of the Census. 2001. Current population survey: Annual demographic survey retrieved February 10, 2009, from http://www.bls.census.gov/cps/ads/2001/sdata.htm

Carroll JS, Padilla-Walker LM, Nelson LJ, Olson CD, Barry CM, Madsen SD. 2008. Generation XXX: Pornography acceptance and use among emerging adults. J Adolesc Res 23:6–30.

Casey EABB, Lindhorst TP. 2009. Predictors of sexually coercive behavior in a nationally representative sample of adolescent males. J Interpers Violence 24:1129–1147.

Centers for Disease Control and Prevention. 2005. Measuring violence-related attitudes, behaviors, and influences among youths: A compendium of assessment tools, Atlanta.

Centers for Disease Control and Prevention. 2006. Youth risk behavior surveillance—United States, 2005. Morb Mortal Wkly Rep 55:1–108.

Chandra A, Martino SC, Collins RL, Elliott MN, Berry SH, Kanouse DF, Miu A. 2008. Does watching sex on television predict teen pregnancy? Findings from a national longitudinal survey of youth. Pediatrics 122:1047–1054.

Conoscenti LM, McNally RJ. 2006. Health complaints in acknowledged and unacknowledged rape victims. J Anxiety Disord 20:372–379.

Cortina LM, Kubiak S. 2006. Gender and posttraumatic stress: Sexual violence as an explanation for women's increased risk. J Abnorm Psychol 115:753–759.

Crockett LJ, Raffaelli M, Moilanen K. 2003. Adolescent sexuality: Behavior and meaning. In: Adams GR, Berzonsky MD (eds). Blackwell Handbook of Adolescence. Oxford, England: Blackwell Publishing, pp 371–392.

de Bruijn PD, Burrie I, Wel FV. 2006. A risky boundary: Unwanted sexual behaviour among youth. J Sex Aggr 12:81–96.

Demaré D, Briere J, Lips H. 1988. Violent pornography and self-reported likelihood of sexual aggression. J Res Pers 22:140–153.

Donnerstein E, Linz D. 1986. Mass media sexual violence and male viewers: Current theory and research. Am Behav Sci 29:601–618.

Fago DP. 2003. Evaluation and treatment of neurodevelopmental deficits in sexually aggressive children and adolescents. Prof Psychol Res Pract 34:248–257.

Finkelhor D, Hamby SL, Ormond R, Turner H. 2005. The juvenile victimization questionnaire: Reliability, validity, and national norms. Child Abuse Negl 29:383–412.

Finkelhor D, Mitchell KJ, Wolak J. 2000. Online Victimization: A Report on the Nation's Youth (No. 6-00-020). Alexandria, VA: National Center for Missing & Exploited Children.

Forgays DG, Forgays DK, Speilberger CD. 1997. Factor structure of the state-trait anger expression inventory. J Pers Assess 69:497–507.

Gray HM, Foshee V. 1997. Adolescent dating violence. J Interpers Violence 12:126–141.

Hall GN, Barongan C. 1997. Prevention of sexual aggression: Sociocultural risk and protective factors. Am Psychol 52:5–14.

Halpern CT, Udry JR, Campbell B, Suchindran C. 1993. Testosterone and pubertal development as predictors of sexual activity: A panel analysis of adolescent males. Psychosom Med 55:436–447.

Harris Interactive. 2006. Online methodology Retrieved July 5, 2006, from http://www.harrisinteractive.com/partner/methodology.asp

Hickey N, Farmer E, Vizard E. 2008. Comparing the developmental and behavioural characteristics of female and male juveniles who present with sexually abusive behaviour. J Sex Aggr 14:241–252.

Katchadourian H. 1990. Sexuality. In: Feldman SS, Elliott GR (eds). At the Threshold: The Developing Adolescent. Cambridge, MA: Harvard University Press, pp 330–351.

Krahe B. 1998. Sexual aggression among adolescents: Prevalence and predictors in a German sample. Psychol Women Q 22:537–554.

Lacasse A, Mendelson MJ. 2007. Sexual coercion among adolescents: Victims and perpetrators. J Interpers Violence 22:424–437.

Lenhart A, Madden M, Hitlin P. 2005. Teens and Technology: Youth Are Leading the Transition to a Fully Wired and Mobile Nation. Washington, DC: Pew Internet and American Life.

Lenhart A, Purcell K, Smith A, Zickuhr K. 2010. Social Media and Young Adults. Washington, DC: Pew Internet & American Life Project.

Linz D, Donnerstein E, Penrod S. 1984. The effects of multiple exposures to filmed violence against women. J Commun 34:130–147.

Malamuth NM. 2003. Criminal and noncriminal sexual aggressors: Integrating psychopathy in a hierarchical-mediational confluence model. In: Prentky RA, Janus ES, Seto MC (eds). Sexually Coercive Behavior: Understanding and Management, Vol. 989. New York: Annals of the New York Academy of Sciences, pp 33–58.

Malamuth NM, Addison T, Koss M. 2000. Pornography and sexual aggression: Are there reliable effects and can we understand them? Annu Rev Sex Res 11:26–91.

Malamuth NM, Heavey CL, Linz D. 1993. Predicting men's antisocial behavior against women: The interaction model of sexual aggression. In: Hall GN, Hirschman R, Graham J, Zaragoza M (eds). Sexual Aggression: Issues in Etiology, Assessment and Treatment. Washington, DC: Hemisphere, pp 63–97.

Maxwell CD, Robinson AL, Post LA. 2003. The nature and predictors of sexual victimization and offending among adolescents. J Youth Adolesc 32:465–477.

McFarlane J, Malecha A, Gist J, Watson K, Batten E, Hall I. 2005. Intimate partner sexual assault against women and associated victim substance use, suicidality, and risk factors for femicide. Issues Ment Health Nurs 26:953–967.

Miller TR, Cohen MA, Wiersema B. 1996. Victim Costs and Consequences: A New Look (No. NCJ 155282). Washington, DC: U.S. Department of Justice, National Institute of Justice.

Molidor C, Tolman RM. 1998. Gender and contextual factors in adolescent dating violence. Violence Against Women 4:180–194.

Ozer EJ, Tschann JM, Pasch LA, Flores E. 2004. Violence perpetration across peer and partner relationships: Co-occurrence and longitudinal patterns among adolescents. J Adolesc Health 34:64–71.

Paul B, Bryant JA. 2005. Adolescents and the internet. Adolesc Med Clin 16:413–426.

Peter J, Valkenburg PM. 2008. Adolescents' exposure to sexually explicit internet material and sexual preoccupancy: A three-wave panel study. [Article]. Media Psychol 11:207–234.

Ponton L, Judice S. 2004. Typical adolescent sexual development. Child Adolesc Psychiatr Clin N Am 13:497–511.

Rideout V. 2001. Generation Rx.com: How young people use the Internet for health information. Published by Kaiser Family Foundation. Available at: http://www.kff.org/entmedia/20011211a-index.cfm (last accessed 10/6/2010).

Schonau M, Zapert K, Simon LP, Sanstad KH, Marcus SM, Adams J, Spranca M, Kan H, Turner R, Berry S. 2004. A comparison between response rates from a propensity-weighted Web survey and an identical RDD survey. Soc Sci Comput Rev 22:128–138.

Seto MC, Lalumière ML. 2010. What is so special about male adolescent sexual offending? A review and test of explanations through meta-analysis. Psychol Bull 136:526–575.

Seto MC, Maric A, Barbaree HE. 2001. The role of pornography in the etiology of sexual aggression. Aggr Violent Behav 6:35–53.

Snyder HN. 2000. Sexual Assault of Young Children as Reported to Law Enforcement: Victim, Incident, and Offender Characteristics. Washington, DC: Bureau of Justice Statistics, U.S. Department of Justice.

Snyder HN, Sickmund M. 2006. Juvenile offenders and victims: 2006 national report. Washington, DC: Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention.

Spielberger CD, Reheiser EC, Hilsenroth MJ, Segal DL. 2004. Measuring anxiety, anger, depression, and curiosity as emotional states and personality traits with the STAI, STAXI and STPI. Comprehensive Handbook of Psychological Assessment, Vol. 2: Personality Assessment. Hoboken, NJ: Wiley, pp 70–86.

StataCorp. 2009. Stata Statistical Software (Version 11). College Station, TX: Stata Press.

Terhanian G, Siegal JW, Overmeyer C, Bremer J, Taylor H. 2001. The record of internet-based opinion polls in predicting the results of 72 races in the November 2000 US Elections. Int J Market Res 43:127–136.

Tolman D, Kim J, Schooler D, Sorsoli L. 2007. Rethinking the association between television viewing and adolescent sexual health: Bringing gender into focus. J Adoles Health 40:9–16.

Udry JR. 1996. The National Longitudinal Study of Adolescent Health (AddHealth) [Wave I and Wave II]. University of North Carolina at Chapel Hill: Carolina Population Center.

USC Annenberg School Center for the Digital Future. 2004. Ten years, ten trends. Year 4. The Digital Future Report: Surveying the Digital Future, from http://www.digitalcenter.org/downloads/DigitalFutureReport-Year4-2004.pdf

Vega V, Malamuth NM. 2007. Predicting sexual aggression: The role of pornography in the context of general and specific risk factors. Aggr Behav 33:104–117.

White JW, Smith PH. 2009. Covariation in the use of physical and sexual intimate partner aggression among adolescent and college-age men: A longitudinal analysis. Violence Against Women 15:24–43.

Williams KM, Cooper BS, Howell TM, Yuille JC, Paulhus DL. 2009. Inferring sexually deviant behavior from corresponding fantasies: The role of personality and pornography consumption. Crim Justice Behav 36:198–222.

Wolak J, Mitchell KJ, Finkelhor D. 2006. Online Victimization of Youth: 5 Years Later (No. 07-06-025). Alexandria, VA: National Center for Missing & Exploited Children.

Wolak J, Mitchell K, Finkelhor D. 2007. Unwanted and wanted exposure to online pornography in a national sample of youth Internet users. Pediatrics 119:247–257.

Ybarra M, Mitchell K. 2005. Exposure to Internet pornography among children and adolescents: A national survey. Cyberpsychol Behav 8:473–486.

Zillmann D. 2000. Influence of unrestrained access to erotica on adolescents' and young adults' dispositions toward sexuality. J Adolesc Health 27:41–44.