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The Role of Violent Media Preference in Cumulative Developmental Risk for Violence and General Aggression

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Abstract

The impact of exposure to violence in the media on the long-term development and short-term expression of aggressive behavior has been well documented. However, gaps in this literature remain, and in particular the role of violent media exposure in shaping violent and other serious antisocial behavior has not been investigated. Further, studies of violent media effects typically have not sampled from populations with confirmed histories of violent and/or nonviolent antisocial behavior. In this study, we analyzed data on 820 youth, including 390 juvenile delinquents and 430 high school students, to examine the relation of violent media use to involvement in violence and general aggression. Using criterion scores developed through cross-informant modeling of data from self, parent/guardian, and teacher/staff reports, we observed that childhood and adolescent violent media preferences contributed significantly to the prediction of violence and general aggression from cumulative risk totals. Findings represent a new and important direction for research on the role of violent media use in the broader matrix of risk factors for youth violence.

Keywords

Media; Violence; Delinquent; Aggression; Risk

On June 24, 2008, six teenagers from Long Island, NY, launched a two hour long crime spree in which they committed a violent mugging and several break-ins and thefts before finally being caught after a carjacking attempt (Crowley 2008). According to the authorities investigating the crimes, the teenagers had determined to replicate the actions of Niko Belic, the thuggish protagonist from the new video game “Grand Theft Auto IV.” Although this particular event represents an extreme example of how violence in the media can promote violence in “real life,” it is wholly consistent with the fact that for decades, exposure to violent media has been acknowledged as a risk factor for aggressive and violent behavior (Anderson et al. 2003; US Surgeon General 1972, 2001).

Broadly speaking, antisocial behavior in adolescence is multiply determined, with risk factors at multiple levels spanning biological, psychological, and contextual influences (Dodge et al. 2006; Frick 2006; Hoge Guerra and Boxer 2008; Huesmann and Eron 1989). Theoretical models of the development of antisocial behavior have embraced this equifinality, acknowledging the numerous ways in which different loci of risk can interact to promote habitual antisocial responses (Dodge and Pettit 2003; Frick and Morris 2004; Guerra and Huesmann 2004). Contemporary strategies for the assessment of youths' violent and nonviolent antisocial behavior involve multiple methods and multiple informants to ensure that the full spectrum of risk is covered (Borum and Verhaagen 2006; McMahan and Frick 2005). Best practice approaches to the treatment of antisocial behavior require multi-component interventions involving the interlocking personal and contextual systems that maintain youths' antisocial behavior (Boxer and Frick 2008; Guerra et al. 1997; Hoge et al. 2008; Henggeler et al. 1998; Metropolitan Area Research Group et al. 2002). Importantly, however, much of the current literature on the development, assessment, and treatment of adolescent antisocial behavior—and associated outcomes such as violence, delinquency, and conduct disorder—overlooks one critical risk factor for aggression: exposure to violent media.

The absence of recognizing exposure to violent media as a salient and robust risk factor for aggressive behavior is a critical omission in the developmental and clinical child/adolescent literature. Yet it is not surprising given the current state of empirical research on violent media effects. Although recent exhaustive narrative reviews (Anderson et al. 2003) and meta-analyses (Anderson and Bushman 2001; Bushman and Huesmann 2006) confirm the causal influence of violent media exposure on aggressive behavior, this area of research has been lacking with respect to sampling populations and measuring criterion outcomes of greatest interest to developmental and child-clinical researchers. Specifically, studies of the effects of violent media on youths' antisocial behavior have been limited in two key respects. First, these studies have almost exclusively involved normative, typical samples of youth drawn from community populations. Second, these studies have almost uniformly failed to measure reliably what might be considered serious physically aggressive, violent, and delinquent behavior.

The present investigation integrates violent media exposure into the broader matrix of risk for violent and nonviolent antisocial behavior. In this study, we interviewed over 800 adolescents, with sampling divided about evenly between a normative population (students attending high schools in rural, suburban, and urban communities) and a high-risk

population (delinquents detained in county and state juvenile justice facilities). We conducted extensive, cross-informant assessments of violent and nonviolent antisocial behavior and collected information about media use as well as a variety of commonly-accepted risk factors for adolescent aggression. With these data we examined the extent to which violent media exposure accounts for involvement in violence as well as general aggression in the context of other risk factors for these behaviors.

“Risk factor” may be defined quite straightforwardly as any personal or contextual characteristic that increases the likelihood of some negative outcome (Institute of Medicine 1994). The risk factors for aggressive behavior in childhood and adolescence are legion and include, among others: *exposure to violence and aggression in the community* (i.e., witnessing or being victimized by aggressive acts; Guerra et al. 2003; Schwartz and Proctor 2000), *in the family* (e.g., viewing spousal abuse or receiving harsh physical discipline; Boxer et al. (in press); McCloskey et al. 1995), *and in schools and peer groups* (e.g., victimization by physically or relationally aggressive acts, membership in antisocial peer groups; Boxer et al. 2003; Espelage et al. 2003). Additional identified risk factors include *academic difficulties* (e.g., low intelligence, poor achievement, learning disability; Huesmann et al. 1987; Stipek 1998); *psychopathic tendencies or callousness-unemotionality* (e.g., shallow affect, lack of concern for others; Frick et al. 2003); and *psychopathology or related emotional problems* (e.g., depression, psychotic symptoms; Boxer 2007; Knox et al. 2000). This is not an exhaustive list of risk factors for aggression, but these are some of the key influences often implicated in models of aggression development (Dodge and Pettit 2003; Frick and Morris 2004; Guerra and Huesmann 2004) and highlighted in recommendations for the general assessment and treatment of aggression and antisocial behavior as well as risk for violence (Borum and Verhaagen 2006; Boxer and Frick 2008; Hoge et al. 2008).

Even a cursory scan of the recent literature on the development of aggression, violence, or delinquency will yield a great number of citations examining at least one or some combination of the risk factors for aggression listed above. However, the potential for exposure to violent media to serve as a risk factor for youth aggression and violence often is left out of this research tradition even though media effects in general fit quite well into models for understanding developmental risk (Gentile and Sesma 2003) and even though the US Surgeon General has acknowledged formally the causal influence of violent media on youth violence (US Surgeon General 1972, 2001). This omission also is striking given the commonly observed size and robustness of violent media effects on aggression—for example, as Bushman and Anderson (2001) showed, the average effect size observed for the link between violent media and aggression ($\approx .30$) is in the same range as if not greater than the average effect size for many other public health phenomena commonly accepted in the scientific literature and lay consensus such as the relation between smoking and lung cancer ($\approx .40$), the relation between passive smoking and lung cancer at work ($\approx .15$), the relation between lead exposure and children's IQ ($\approx -.15$), and the relation between asbestos exposure and laryngeal cancer ($\approx .10$).

Part of the reason that media violence has not yet been well-integrated into the developmental literature on risk for aggression is that, until recently, very few

developmental longitudinal studies have been able to document media violence effects. However, there now are a few well-conducted studies demonstrating these effects. For example, in a cohort of individuals first assessed during middle childhood and then again in early adulthood, Huesmann et al. (2003) found that even after controlling parental SES, children's academic skills, and childhood aggression, childhood TV violence viewing significantly predicted adolescent and adult aggression. Similar findings were reported by Eron et al (1972), Huesmann (1986), Viemero (1996), and Christakis and Zimmerman (2007). Anderson et al. (2007) also have presented results of short-term longitudinal research showing that violent videogame playing is linked over time to increased aggression in the presence of other risk factors.

As noted briefly earlier, there are two other critical aspects of research on violent media effects that have maintained their omission from mainstream research on developmental risk for aggression and violence. First, extant developmental studies of violent media effects usually involve normative, typical samples of youth from community populations. The Huesmann et al. (2003) USA study and the Huesmann, Lagerspetz, and Viemero Finland study (Huesmann et al. 1984; Viemero 1996) relied on cohorts drawn from suburban schools and intended to be representative of those communities. Anderson et al. (2007) sampled from school populations of rural and suburban children. Second, likely due to their reliance on normative populations, developmental studies generally have not been able to assess and capture serious physically aggressive, violent, and delinquent behavior. Even when these studies do include such measures, the lack of variability due to low baserates of serious aggression and violence in the general population limits the inferences that can be drawn.

Goals and Hypotheses

Our investigation was designed to address the limitations reviewed above, and to examine exposure to violent media in the larger risk matrix associated with violent and nonviolent antisocial behavior. We were interested in the effects of violent media exposure on antisocial behavior in the context of other risk factors, following Huesmann et al. (2003) and Viemero (1996). Primarily, we were interested in the role played by violent media exposure in contributing to cumulative risk for antisocial behavior. A cumulative risk view asserts that the number of risk factors experienced by an individual is more important for predicting negative outcomes in comparison to the specific types of risks involved (Rutter 1979; Sameroff 2000). Anderson et al. (2007) provided evidence for the importance of adding violent media exposure to cumulative risk totals when predicting aggressive behavior.

In this study we conducted individual interviews with 390 juvenile delinquents detained in county and state facilities and small group surveys with 430 high school students attending schools in rural, suburban, and urban communities. Youth reported on their preferences and consumption habits with respect to television shows, films, and video/computer games, and provided information on their antisocial behavior and several related risk factors. The parents/guardians and teachers/facility staff of these youth provided converging criterion information on the youths' antisocial behaviors, including violent acts and conduct problems. We hypothesized that including violent media exposure into cumulative risk

computations would yield significant improvement to predicting antisocial behavior from the cumulative risk total.

Methods

Participants

Participants in this study were youth ($N = 820$) sampled from populations of high school students ($n = 430$; 51.6% female; M age = 16.83 years, $SD = .71$; 45.9% racial/ethnic minority) and incarcerated delinquents ($n = 390$; 26.4% female; M age = 15.55 years, $SD = 1.53$; 45.1% racial/ethnic minority). Youth completed extensive individual interviews, and their parents/guardians (of 728 youth) as well as teachers/staff (of 717 youth) provided data through telephone or mailed surveys. Data from at least one other source were available for 806 youth (98.3%); data from both additional sources were available for 639 youth (77.9%).

Measures: Violent Media Content Preferences

Youth indicated their three favorite television shows, movies/films, and video/computer games during childhood (when they were “7 or 8 years old”) and since being “a teenager.” We prompted youth to respond with respect to the middle childhood time period via a guided recall procedure:

We would like you to think back to when you were much younger, around 7 or 8 years old or in 2nd, 3rd, or 4th grade. Where did you go to school then? Where did you live? What kinds of things were happening in your life? We would like to know about the kinds of television shows, movies, video games, and music videos you used to enjoy back then. Think back carefully, and try to remember all that you can about what things were like for you at that age.

All titles listed by youth across the three media categories were subsequently coded by reliable independent raters to describe the extent to which they contained visible interpersonal violence via a 5-point rating scheme (0 = no visible violence or slight invisible [implied] violence... 4 = high visible violence). A full description of these coding procedures is available as a technical report from the first author. Briefly, about 25 independent raters reviewed the lists of television, film, and video/computer game titles generated by the participants and rated the ones for which they had direct knowledge of the violent content. Titles that could not be rated in this manner usually were treated as “missing” in the analysis datasets unless ratings could be inferred from available descriptions or reviews of the content from a variety of sources (e.g., Internet Movie Database, All Media Guide). Interrater reliabilities as indicated by the interrater alpha coefficients (Carmines and Zeller 1979) were high: .99 (television shows and video games) and .98 (films).

Measures: Criterion Indicators of Violent and Aggressive Behavior

Delinquent Behavior and Conduct Problems—Youth completed the 22-item Delinquency Scale (Elliott and Huizinga 1983). Youth made ratings along a 5-point scale (0 = *never*... 4 = *five or more times*) for items describing specific delinquent acts (e.g., “How often since you have been a teenager have you... thrown rocks or bottles at people?” “...

knowingly sold or held stolen goods?”). The scale composite is the mean of all 22 items ($\alpha = .94$).

Parents/guardians and teachers/staff completed the 5-item Conduct Problems subscale of Goodman's (2001) Strengths and Difficulties Questionnaire. Informants made ratings on a 3-point scale (0 = *not true*... 2 = *certainly true*) for items indicating various problem behaviors (e.g., “Often fights with other youth or bullies them”). The scale composite is the mean of all 5 items (parent/guardian $\alpha = .86$; teacher/staff $\alpha = .82$).

Serious Physical Aggression—Youth completed the 4-item Severe Physical Aggression Scale (Lefkowitz et al. 1977). Youth made ratings along a 4-point scale (0 = *never*... 3 = *a lot*) to indicate how often they have engaged in serious physically aggressive acts (e.g., “How often since you have been a teenager have you punched or beaten someone?”). The scale composite is the mean of all 4 items ($\alpha = .80$), log-transformed to reduce skewness.

Parents/guardians and teachers/staff completed different versions of a new measure developed for this project measuring serious aggressive behavior. Due to time constraints in the teacher/staff battery, the teacher/staff measure was shorter than was the parent/guardian measures. Parents/guardians completed a 15-item measure, using a 5-point rating scale (0 = *never*... 4 = *every day*) to indicate the youths' frequency of engagement in serious physically aggressive acts (e.g., “Using a weapon against another child... How often has this occurred?”). For each of these items, parents/guardians then indicated whether the youth ever had caused “serious” injury or damage as the result of his/her behavior. The teacher/staff version contained 5 items with the same response scale; items with generally similar content were combined and some lower base rate (e.g., physically attacking animals) and less serious (e.g., destroying property) indicators were removed. There were no questions concerning injurious or destructive impact. The scale composite is the mean of all 15 items for the parent/guardian frequency scale ($\alpha = .87$) and all 5 items for teachers/staff ($\alpha = .87$). Internal reliability is not appropriate for the parent/guardian injury scale because parents/guardians only responded if they had provided any affirmative response for the matched frequency item; scores on this scale were summed.

Trait Aggressiveness and General Aggressiveness—Youth completed the 9-item physical aggression subscale of the Buss-Perry Aggression Questionnaire (Buss and Perry 1992). Youth made ratings along a 5-point scale (0 = *not at all true of me*... 4 = *very true of me*) for items describing tendencies toward aggressive responding (e.g., “If I have to resort to violence to protect my rights, I will”). The scale composite is the mean of all 9 items ($\alpha = .80$). Teachers/staff completed the 10-item aggression scale of the Teacher's Predictions of Peer Nominations measure (Huesmann et al. 1994). Teachers rated youth on a 7-point scale (0 = 0%... 7 = *over 75%*) to estimate the proportion of peers who would think the youth behaved in aggressive ways (e.g., “What percentage of youth would say that this child... is someone who pushes and shoves others?”). The scale composite is the mean of all 10 items ($\alpha = .94$). As an index of criterion validity for our behavioral measures, independent-samples *t* tests confirmed that for both males and females, delinquents uniformly were self-rated and rated by others as significantly more aggressive than were students (all $p < .001$).

Using the AMOS 7.0 program we applied latent variable modeling to estimate two latent constructs integrating behavioral information across raters and indicating “Violent Behavior” (youth, parent/guardian, and teacher/staff reports of serious physical aggression; parent/guardian report of injurious behavior) and “General Aggressive Behavior” not specifically violent in nature (youth report of delinquent behavior and trait aggressiveness; parent/guardian report of conduct problems; teacher/staff report of conduct problems and general aggression). The AMOS program applies full information maximum likelihood (FIML) to analyze the fit of the model in the presence of missing data, and subsequently can generate via regression imputation new variables for the latent factor scores.

The fit of the measurement model was acceptable ($\chi^2/df = 1.79$, RMSEA = .03, Pclose = .96, CFI = .99). Because our purpose was solely to derive a reliable cross-informant composite we did not constrain any parameters as the function of subgroups within the overall sample. Two-way (sex by adjudication status) univariate analyses of variance (ANOVA) illuminated the criterion validity of the factor scores generated by the model. For Violent Behavior we observed significant ($p < .001$) and robust (Effect size [partial η^2] = .39) main effects of adjudication status and a small sex by adjudication status interaction effect (female delinquents most aggressive, female students least aggressive; $p < .01$, (Effect size [partial η^2] = .01). There was no main effect of sex. We observed similar differences with respect to General Aggressive Behavior for the main effect of adjudication status ($p < .001$, effect size [partial η^2] = .41) and the same pattern of sex by adjudication status interaction ($p < .05$, effect size [partial η^2] = .01). Again, there was no main effect of sex.

Measures: Common Personal and Social-Contextual Risk Factors for Antisocial Behavior

Callous-Unemotional Traits—Youth completed the Inventory of Callous-Unemotional Traits, a measure of hallmark characteristics of juvenile psychopathy linked to delinquency and involvement in violent behavior (Essau et al. 2006; Frick 2004; Kimonis et al. in press). Youth rated “how well” each of 24 statements described them along a 4-point scale (0 = *not at all true*... 3 = *definitely true*). Items tapped three hypothesized components of the CU construct, including Uncaring (e.g., “I care about how well I do at school or work”), Callousness (e.g., “I do not care who I hurt to get what I want”), and Unemotional (e.g., “I hide my feelings from others”). Psychometric analyses yielded more meaningful and robust findings with respect to reliability and validity via the total score after excluding two consistently unreliable items (does not know right from wrong, does not let feelings control him/her) identified by Kimonis et al. (in press). We used total scores excising these two items ($\alpha = .83$).

Academic Skills—To provide a broad index of academic skill, youth completed the Arithmetic subtest of the Wide Range Achievement Test, Third edition (Wilkinson 1993). This is a self-paced computational skills test covering the typical arithmetic curriculum from kindergarten through 12th grade and produces standard scores adjusted by age and aligned on the same scale as IQ scores (i.e., $M = 100$, $SD = 15$). This test has good established reliability (e.g., $\alpha = .85$ for adolescents; Wilkinson 1993) and validity, and scores on the Arithmetic subtest correlate highly with other subtests (Reading and Spelling) as well as standard measures of intelligence (Wilkinson 1993).

Psychopathology—Youth completed the 6-item Depression (e.g., “feeling hopeless about the future”) and 5-item Psychoticism (e.g., “the idea that something is wrong with your mind”) sub-scales of the Brief Symptom Inventory (Derogatis 1992). Youth rate the extent to which they have experienced various symptoms of each form of psychopathology during the 7 days prior to assessment on a 5-point scale (0 = *not at all*... 4 = *extremely*). Composite scores are the mean of the raw item scores for each scale multiplied by the number of items on the scale (Depression $\alpha = .86$; Psychoticism $\alpha = .76$).

Exposure to Neighborhood Violence—Youth completed the 4-item neighborhood violence sub-scale of Attar (1994) Stressful Urban Life Events scale (see also Guerra et al. 2003). Similar to the media exposure measures, youth responded to the neighborhood violence items with respect to childhood and recent exposure. Youth indicate (0 = *no*, 1 = *yes*) whether they have been exposed to specific indicators of neighborhood violence (e.g., “Have you seen anyone beaten, shot, or really hurt by someone?”). Composite scores are the sum of the four indicators for childhood and recent time periods (KR20 [childhood] = .58, KR20 [recent] = .56).

Exposure to Low Level Aggression—Youth completed the 11-item measure developed by Boxer and colleagues (Boxer et al. 2003) to assess experiences with witnessing and being victimized by “low level” aggressive acts of direct and indirect verbal aggression and mild physical aggression (e.g., “How often have you seen another person get hit or pushed?” “How often have you had rumors spread about you?”). Responses were made on a 4-point scale (0 = *never*... 3 = *a lot of times*). Previous research with this measure has examined subtypes of low level aggression exposure separately (Boxer et al. 2003; Musher-Eizenman et al. 2004), but for the purposes of the present investigation we used the internally reliable total score, computed as the mean of all items ($\alpha = .81$).

Procedures

All procedures were approved by the university institutional review board (IRB) regulating the implementation of the study, the state agency overseeing the state detention facilities, the federal Office of Human Research Protections, the IRB of the Centers for Disease Control, and the directors or principals of all schools and detention facilities involved in the project. Data collection occurred during 2005 through 2007. Youth were recruited from public high schools (rural, suburban, and urban) and juvenile detention centers (county and state) selected to yield a sample representing a range of risk for aggressive and violent behavior. With only slight variations within site types (high school or detention facility), recruitment and interview procedures were conducted differently between the students and delinquents. Across all sites, parent/guardian consent rates averaged about 40% (range by site = 33.6%–48.8%), unsurprising given the length of the survey batteries and nature of the populations sampled.

In high schools, informational letters and parental consent forms were mailed with stamped return envelopes to parents/guardians of students in 11th and 12th grades; two weeks after the initial mailings, second mailings were sent to parents/guardians who had not responded by that time. Remaining parents/guardians who did not respond by mail to the second

contact attempt were solicited by telephone. Parents/guardians could grant permission for their children to participate in writing (mailed) or over the telephone (recorded). After their children were interviewed, parents/guardians and the youths' teachers (usually social studies teachers; if those teachers were unwilling or unavailable we worked with schools to identify replacements who knew the target youth well) were provided with survey booklets to complete. Parents/guardians had the option of completing surveys over the telephone as we have done previously in field research (Author citation). Teachers completed surveys by paper and pencil. Youth interviews were conducted via paper-and-pencil Scantron survey forms in small groups ranging typically from about 10–15 students depending upon availability, and led by at least two trained staff for every 10–15 students.

In detention facilities, informational letters and consent forms typically were sent to parents/guardians of all youth housed by the facilities at the start of data collection, and provided to the parents/guardians of any new admissions to the facilities over the period of data collection. In these facilities, we were permitted to make the follow-up telephone calls without first sending a second mailing. As with the students, after a delinquent completed his or her interview, we mailed a survey to parents/guardians and provided a survey to staff. Again, parents/guardians had the option to complete their surveys over the telephone, and staff completed surveys by paper and pencil. Youth interviews were conducted individually by trained staff via laptop computer. Most youth interviews with students and delinquents took approximately one hour.

Across data collection sites, all individuals who provided data were compensated financially in some manner, primarily gift certificates to local merchants, with variations from site to site due to agency regulations or extraneous factors. All high school students received \$20, except those in a school collaborating with our research team on another investigation necessitating compensation of \$40. All delinquents received \$10 compensation due to agency restrictions. Parents/guardians of high school students received \$25; parents/guardians of delinquents received \$50. All teachers and staff received \$5 per completed survey, although this was distributed differently by site due to school or agency policies (e.g., teachers typically received cash but staff had their compensation put into a common fund for staff-wide rewards such as appreciation lunches).

Results

Table 1 shows the bivariate correlations among all the study variables along with sex, age, and adjudication status across the full sample. As shown, there are significant relations between both childhood and current exposure to media violence and both violent behavior and general aggression. However, many other risk factors also correlate with these media measures and the behavior measures. Consequently, we need to examine the role of the media measures in the multivariate context of cumulative risk involving all the risk factors.

We recoded the common risk factors and the violent media preference variables to indicate dichotomized levels of risk, following typical approaches to measuring and combining multiple sources of developmental risk as discussed earlier in our Introduction (e.g., Sameroff 2000). A number of criminologists have argued that dichotomizing predictors is

particularly valid for examining the occurrence of rare events (see Farrington and Loeber 2000). Youth in the highest quartile of risk on a factor received a 1 indicating “risk present” and those in the lower three quartiles of risk received a 0 indicating “risk absent.” The use of upper quartiles for determining the presence of risk ensures a high level of risk and is consistent with prior research conducted by established investigators working within this tradition (e.g., Appleyard et al. 2005; Evans 2003; Gutman et al. 2003; Huesmann et al. 2003). These dichotomized scores were then used to create three new composites. The “Media Violence Risk” (MVR) composite was the sum of the two media violence risk indicators. The “Other Risks” (OR) composite was the sum of all seven risk indicators except the violent media indicators; and the “Total Risk” (TR) composites added the two media violence risk indicators to the seven other risk indicators. The MVR composite has a theoretical range of 0–2, the OR composite has a theoretical range of 0–7, and the TR composite has a theoretical range of 0–9.

Overall, the mean for the MVR composite was 0.50 ($SD = .66$), the mean for the OR composite was 1.58 ($SD = 1.52$), and the mean for the TR composite was 2.07 ($SD = 1.75$). Two-way ANOVAs of these scores with sex and adjudication status as the independent variables produced results somewhat similar to the analyses of the Violent and General Aggressive Behavior scores. Delinquents had higher levels of risk on both Other Risks (OR; $p < .001$, effect size [partial η^2] = .18) and Total Risk (TR; $p < .001$, effect size [partial η^2] = .18), with significant main effects for sex qualified by sex by adjudication status interactions (OR: $p < .001$, effect size [partial η^2] = .02; TR: $p < .01$, effect size [partial η^2] = .01). Delinquent females had the highest levels of risk on both scores. Delinquents also had higher levels of risk on the MVR composite ($p < .001$, effect size [partial η^2] = .02), with no main effect of sex and no sex by adjudication status interaction.

Regressions were computed to examine the relative strength of the risk composite with violent media preferences included for predicting Violent Behavior and General Aggressive Behavior in comparison to the risk composite excluding violent media preferences, after controlling sex and age. We did not set adjudication status as a control variable because this would eliminate the meaningful variability in the criterion scores. Table 2 shows the results of these analyses. As shown by Step 2a, media violence risk (MVR) alone accounts for significant variance in the outcome variables even when controlling the effects of sex and age. The other risk composite (OR) including all risk factors except for violent media preference also accounts for significant variance in the outcome scores after controlling sex and age (see Step 2b). Most importantly, as shown by comparing R^2 change for Step 2c with 2b, the “Total Risk” composite, including both media violence risk and other risks, predicted significantly more variance than Other Risks alone for Violent Behavior and for General Aggressive Behavior.

Another way to test the significance of the unique contribution of Media Violence Risk is by examining whether Media Violence Risk (MVR) has a significant effect in a regression when paired with the Other Risk (OR) as predictors of the outcome variables. This is done in Step 2d in Table 2. One can see that Media Violence Risk has a significant additional effect ($p < .001$) over Other Risks for predicting both Violent Behavior and General Aggressive Behavior. The increases in R^2 for Step 2d are higher than the increases for Step 2c because

the regression analyses of Step 2d optimize the combination of Other Risk and Media Violence Risk in predicting the outcome variables.

Finally, we examined the additional question of whether violent media preferences predict violence and general aggression among youth with none of the other risk factors measured in this study; i.e., youth with scores of zero on the “media violence absent” composite. A total of 229 youth met this criterion. Limiting the regression analysis to only this subgroup still produced significant prediction of violence and general aggression after controlling sex and age. For Violent Behavior, violent media preference produced a standardized beta of .269, $p < .001$; for General Aggressive Behavior, violent media preference produced a standardized beta of .213, $p < .01$.

Discussion

In this investigation we conducted extensive interviews with adolescents from high schools and juvenile detention facilities to assess their current and childhood media preferences with respect to television, film, and video/computer games, along with their aggressive and violent behaviors and status on a number of risk factors for aggression. We obtained converging criterion information on their behavior from their parents/guardians and teachers/staff. Our goal was to examine the role of violent media preferences in the analysis of cumulative risk for violence and general aggression along with other important and more commonly acknowledged risk factors for those behaviors. We observed modest predictive effects, with violent media preferences accounting for small but significant proportions of variance in outcomes. Although this investigation has a few limitations, most notably a cross-sectional design, it represents some important new directions for research on understanding the role played by violent media consumption in the broader matrix of risk for aggression and violence.

As Anderson et al.'s (2003) narrative review and Bushman and Huesmann's (2006) meta-analysis made clear, there currently can be very little doubt that exposure to violence in the media has a consistent and substantial impact on aggressive behavior. Even so, violent media exposure typically is not afforded mention in best practice recommendations for the assessment and treatment of violence and aggression. In our view this is likely attributable to two related gaps in the extant literature base.

The first gap is the almost universal reliance on normative samples to examine violent media effects, and the second gap is the apparent absence of media violence research that includes unambiguous criterion outcome variables indicating violence or severe antisocial behavior. Much of the lab-based experimental work, especially early work, on violent media effects has been conducted with college students. Despite Anderson et al. (1999) well founded assertions regarding the translation of lab findings to the “real world” via coherent theoretical models, experimental analogs of aggressive behavior such as noise blasts and hot sauce (see Ritter and Eslea 2005) can seem less than convincing to researchers and practitioners dealing with delinquents who engage in serious violent and nonviolent antisocial behavior. It should be noted, however, that researchers recently have been working to enhance the perceived violence potential of laboratory analogs. For example,

Konijn et al. (2007) used the noise blast paradigm to investigate violent media effects in adolescent males, and emphasized in their instructions to youth participants that the noise blasts could cause permanent hearing damage.

Further, field research examining the impact of violent media on aggressive behavior also has relied on normative community samples of youth, and although some of these studies have measured behaviors at the more severe end of the aggression continuum, base rates of these behaviors (e.g., interpersonal physical violence) are too low to yield substantial variability. Our investigation was designed in part to fill these gaps. Almost half our subjects were juvenile delinquents detained in county or state detention facilities, and we implemented a multiple informant assessment of both violence and general aggressive behavior. Considering our regression analyses (i.e., step 2a in Table 2), it can be seen that violent media exposure does relate meaningfully and significantly to engagement in violence and aggression even after controlling the substantial effects of sex and age.

Given that violence is a multiply determined behavior, with risk emanating from a variety of personal and contextual domains, it is limiting to focus on the risk enhancing impact of violent media exposure in isolation. In this study we collected data on several different personal and contextual risk factors for aggression in order to examine whether violent media exposure still can produce significant relations to violence and aggression when the effects of those other factors are considered. To examine this issue we presented analyses integrating of violent media exposure scores into cumulative risk totals, following the general precedent for this sort of conceptualization of risk advanced by Rutter (1979) and Sameroff (2000), among others. Here, we found that including violent media preference scores (dichotomized so that risk = highest quartile of violent preference) added significantly to the prediction of both violence and general aggression. Furthermore, even for those lowest in other risk factors, a preference for violent media was predictive of violent behavior and general aggression. This finding is consistent with earlier research showing that even low-aggressive individuals are affected by media violence (Eron et al. 1972). This analysis points to the utility of including violent media exposure into developmental models of risk for aggression.

As mentioned briefly above, we were limited in this investigation by the cross-sectional design of the assessment. Although inspection of the favorite media titles named by our participants suggests that youth were indeed recalling the television shows, films, and videogames of their childhood days, these data are only retrospective and might be biased by current preferences. Further, given the time allotted for our interviews, we were not able to measure an exhaustive array of risk factors for aggression, although we did measure a variety of key personal and contextual influences. Finally, longitudinal research in normative, community samples examining the impact of violent media on youth aggression is ongoing (e.g., Bushman et al. 2008). But, research is needed to understand the role played by media violence exposure in the emergence and maintenance of, and even increase in, violent behavior over time in at-risk and high-risk youth populations.

Despite the limitations of this study and the clear need for longitudinal methods examining the impact of media violence on the development of violence, it is important to emphasize

two key points from our investigation. First, violent media exposure is associated with involvement in violent behavior. This is a new contribution of the present investigation, bolstered by our cross-informant (youth, parent/guardian, teacher/staff) modeling of criterion scores. Second, studies of aggression development that incorporate the measurement of various sources of risk should include measures of violent media consumption. Not only would this addition be consistent with major, longstanding models of development such as ecological systems theory (Bronfenbrenner 1979), but it would be critical to the application of developmental research to the assessment and treatment of violent and nonviolent antisocial behavior (Guerra et al. 2005).

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Table 1
Bivariate correlations among study variables and demographic indicators, full sample

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Sex (0 = female, 1 = male)	–												
2. Age	-.05	–											
3. A djud status (0 = student, 1 = delinq)	.26**	-.48**	–										
4. Violent Behavior	.18**	-.30**	.64**	–									
5. General Agg Behavior	.19**	-.32**	.66**	.96**	–								
6. Violent Media Pref-Childhood	.48**	-.03	.17**	.22**	.21**	–							
7. Violent Media Pref-Current	.46**	-.09**	.26**	.25**	.25**	.41**	–						
8. Callousness	.21**	-.17**	.28**	.41**	.42**	.17**	.25**	–					
9. Acad skills	.07*	.11**	-.24**	-.21**	-.23**	.04	-.04	-.07*	–				
10. Depression	-.11**	-.09*	.22**	.28**	.28**	-.02	.09*	.10**	-.02	–			
11. Psychoticism	-.08*	-.08*	.22**	.26**	.25**	-.03	.05	.09*	-.08*	.81**	–		
12. Neighborhood Viol-Childhood	.07*	-.11**	.24**	.41**	.41**	.19**	.12**	.16**	-.18**	.20**	.23**	–	
13. Neighborhood Viol-Current	.06	-.04	.16**	.36**	.36**	.14**	.10**	.18**	-.12**	.16**	.19**	.67**	–
14. Witness/Vic Low Level Agg	.13**	-.06	.34**	.41**	.40**	.15**	.17**	.18**	-.04	.43**	.42**	.35**	.34**

* $p < .05$

** $p < .01$

Table 2
Regression analyses predicting violence and general aggression from cumulative risk composites

Step/Predictors	Violent behavior		General aggressive behavior	
	b	SE (b)	β	SE (b)
Step 1: Control variables				
Sex (0 = female, 1 = male)	.024***	.004	.181	3.425***
Age in years	-.013***	.002	-.278	-.228
R ²	.115***		.130***	
Step 2a: add to Step 1				
“Media violence risk” (MVR)	.019***	.003	.195	2.507***
R ² change from Step 1	.038***		.034***	
Step 2b: add to Step 1				
“Other Risks” (OR)	.020***	.001	.472	2.852***
R ² change from Step 1	.217***		.227***	
Step 2c: add to Step 1				
“Total risk” (TR = OR + MVR)	.018***	.001	.481	2.472***
R ² change from Step 1	.227***		.230***	
Step 2d: add to Step 1				
“Other Risk” (OR)	.019***	.001	.450	2.739***
“Media Violence Risk” (MVR)	.012***	.003	.119	1.418***
R ² change from Step 1	.231***		.238***	

* $p < .05$

** $p < .01$

*** $p < .001$