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Abstract

Violent video game playing is correlated with aggression, but its relation to antisocial behavior in correctional and juvenile justice samples is largely unknown. Based on a data from a sample of institutionalized juvenile delinquents, behavioral and attitudinal measures relating to violent video game playing were associated with a composite measure of delinquency and a more specific measure of violent delinquency after controlling for the effects of screen time, years playing video games, age, sex, race, delinquency history, and psychopathic personality traits. Violent video games are associated with antisociality even in a clinical sample, and these effects withstand the robust influences of multiple correlates of juvenile delinquency and youth violence most notably psychopathy.

Keywords

violent video games, delinquency, violence, media, psychopathy

Introduction

Decades of research have shown that serious, chronic, and violent juvenile delinquents display a set of personality and behavioral characteristics that set them apart from less serious, nominally antisocial youth (DeLisi & Piquero, 2011; Farrington, Loeber, & Berg, 2012; Jones, Miller, & Lynam, 2011; Moffitt, 1993; Trulson, 2007). Serious delinquents often have precocious self-regulation behaviors and corresponding juvenile justice system interventions occurring during childhood, engage in assorted delinquent behaviors often at high frequencies, and struggle to achieve functioning competencies in school, family, and work demands. Moreover, they often display a multitude of risk factors for delinquency and violence compared to less antisocial youth (DeLisi et al., 2011;

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Trulson, DeLisi, Caudill, Belshaw, & Marquart, 2010; Vaughn, DeLisi, et al., 2011; Vaughn, Fu, et al., 2011). Whereas many youth display a small number of potential risk factors for externalizing behaviors, the most serious, violent, and habitually antisocial youth display a significantly longer list of risk factors for problem behaviors (Blackburn & Trulson, 2010; Brame, Mazerolle, & Piquero, 2010; DeLisi, 2005; Farrington et al., 2012; Kort-Butler, 2010; Trulson, Caudill, Haerle, & DeLisi, 2012).

Curiously, criminologists have been slow to examine the putative criminogenic effects of violent video games on serious delinquency and youth violence. This is ironic because there is an extensive literature in psychology linking violent video games and other forms of violent media exposure to aggression and other antisocial conditions (Anderson & Bushman, 2001, 2002b; Bavelier et al., 2011; Mitchell, 2012). Indeed, the potential effects of violent media on youth aggression have been of concern for decades with several meta-analyses providing evidence that there is an effect on physical aggression (Anderson & Bushman, 2001; Anderson et al., 2010; Comstock & Scharrer, 2003; Mitchell, 2012).

Several domain-specific theories of aggression have been tested and help explain the learning and brain processes by which media violence can influence later aggressive behavior with the General Aggression Model providing a comprehensive metatheory incorporating these smaller theories (Anderson & Bushman, 2002a; Carnagey & Anderson, 2003). Briefly, the General Aggression Model asserts that violent media exposure desensitizes youth to violence because it contains initially fearful material that is couched in a positive emotional content. After repeated exposure, there are psychological and physiological reductions of fear and anxiety to violence such that violent imagery becomes normalized and mundane. This sets into motion a variety of cognitive and affective consequences including decreased perception of injury severity, decreased attention to violent events, decreased sympathy for victims of violence, and decreased negative attitudes toward violence among others. At the behavioral level, these cognitive schemas are associated with decreased helping or prosocial behaviors and increased antisocial behaviors including aggression (Bushman & Anderson, 2009; Greitemeyer & McLatchie, 2011).

The association between violent video games and antisocial behavior is not without controversy, however. A general critique is that media generally and violent video games specifically are part and parcel of adolescence and that media exposure is too ubiquitous to have a discernible effect on delinquency especially when other confounds are considered. To illustrate this idea, Ferguson, San Miguel, Garza, and Jerabeck (2012, p. 144) recently assessed, "Video game violence was not related to child or parent reported pathological aggression. In bivariate correlations, video game violence use was related to reduced dating violence; however, this relationship did not hold once other variables were controlled. These results confirm expectations by other scholars that any links between video games and aggression are merely the byproduct of other processes occurring in the life of the child." Indeed, some researchers have suggested that there is almost no evidence that media violence is related to serious or criminal violence (see Ferguson, 2007; Ferguson, San Miguel, & Hartley, 2009; Ferguson et al., 2012). There are very few studies focused on serious delinquency and violence, and it is likely that effect sizes diminish as the aggressive outcome variable becomes more severe (Anderson et al., 2003; Bavelier et al., 2011; Paik & Comstock, 1994). Theoretically, this makes sense as any single distal environmental factor should have less effect as the outcome becomes more extreme.

This area of research often engenders debate in policy discussions relating to youth violence and juvenile justice, with much of it heated up by the recent U.S. Supreme Court case that focused on a California law restricting the sale of violent video games to children without parent permission (*Brown v. EMA*, 2011). Two *Amicus Curiae* briefs were submitted to the Court by teams of researchers. One argued that research was fairly strong showing that violent video games are related to aggression and one argued that the research was weak. Why do proponents and critics of the research

seem to disagree on what should be a fairly clear distinction? What makes them seem so different is that they focus on different outcomes. The critics of the aggression literature tend to focus on “violence.” That is, they care most about criminal-level physical violence. In contrast, the proponents of the research tend to focus on “aggression.” That is, they care most about day-to-day low-level aggression, such as verbal aggression, relational aggression, and minor physical aggression—the types that are seen daily in classroom and other social settings.

In the *Brown v. Entertainment Merchants Association* (EMA) case, the Justices were divided on how strong they believed the scientific evidence to be. The majority opinion stated that the accumulated studies did not “prove that violent video games *cause* minors to *act* aggressively (which would at least be a beginning)” (pp. 12–13). Note the standard that is required—“proving” (a word scientists almost never use) that games cause children to immediately act aggressive would only be a “beginning,” and would still not be sufficient. Although there is strong evidence that violent video games (and violent media in general) can change the way people think, this psychological cognitive level of effect is clearly not compelling to the Court. Although thoughts are related to actions, they are neither necessary nor sufficient. In fact, even if violent games *did* necessarily change children’s actions every time, such as by making them bully their siblings, the Court admits that it would only be a start. The Court is not an arbiter of scientific truth, which they admit directly—“We have no business passing judgment on the view . . . that violent video games . . . corrupt the young or harm their moral development” (p. 17). Instead, the Court is an arbiter of legal precedent, and as such, it is concerned with the types of issues that the legal system deals with. That means that it cares about *criminal-level aggression*, not low-level aggression. This appears to be why the majority opinion of the Court agrees with the critics of the literature—they appear concerned about *criminal* aggression rather than lower-level daily aggression.

Study Aim

Several researchers have called for aggression to be considered a public health outcome, with media violence considered as one of the many risk factors for aggression and youth violence (Gentile & Sesma, 2003; U. S. Surgeon General, 2001). In a systematic review, Browne and Hamilton-Giachritsis (2005, p. 708) concluded, “individuals from violent backgrounds and those predisposed to aggressive behavior might be more susceptible than others are to the effect of watching and interacting with violent images The effect of media violence on vulnerable female viewers has been a neglected area of research.” The present study was designed to respond to these needs using a multifactorial risk factor approach focused on more serious violent delinquent behaviors among a correctional sample of serious male and female institutionalized delinquents.

Method

Participants

The data ($N = 227$) are derived from a nonprobability sample of adolescent youth in two (one male only and one female only) private nonprofit long-term residential placement facilities for juvenile offenders in Western Pennsylvania (Shook, Vaughn, Goodkind, & Johnson, 2011). Data collection at the boys’ facility occurred from June 2009 through August 2009 ($N = 126$). Criteria for boys being enrolled in the study included being between 14 and 18 years old and having been in the facility between 3 and 12 months when recruitment started. Data collection at the girls’ facility occurred over a 4-month period from October 2009 until February 2010. This facility is much smaller than the boys’ facility so we attempted to include all the young women in the facility and all of those that entered during the data collection period ($N = 101$). Consequently, 55% of the sample consists of boys and 45% consists of girls.

The boys and girls in this sample are extensively involved in diverse forms of antisocial conduct and have commensurately extensive juvenile justice histories. In term of mean levels of delinquency and youth violence, the modal youth in the current sample committed more than 15 acts of delinquency and nearly 9 acts of serious violence, such as gang fighting, hitting a teacher, hitting a parent, hitting other students, and attacking another person in the prior year. Approximately 70% of the sample were drug sellers and 64% of youths who reported drug sales indicated that they sold drugs on a daily basis (Shook et al., 2011). Nearly 38% of the sample had been officially referred to a juvenile court by age 13 and more than 18% of the sample had their first juvenile court appearance by age 12. In other words, the current adjudicated delinquents and their behavioral data provide an ideal opportunity to examine the linkages between violent video game exposure and delinquency in a correctional or clinical sample.

Procedures

Data were collected in accordance with protocols approved by the Institutional Review Board at the University of Pittsburgh. After the study was described by facility staff and the youth expressed interest, a supervisor at the facilities provided approval for the youth to take part in the study and the youth were referred to research staff. Prior to administering the instrument, the interviewer explained the purpose of the study and received assent from each youth (consent from those 18 and 19 years old). Structured one-on-one interviews were carried out by trained graduate students using Computer-Assisted Survey Interview (CASI) techniques. Interviewers completed an intensive 1-day training session and an interview editor was on-site as youth were interviewed to minimize interviewer omissions and errors.

All interviews were conducted in rooms that provided private areas where confidential interviews could be conducted simultaneously between three and five youth. The CASI data collection procedures allowed the respondent to have each question read to them supplemented by response cards. There was an on-site data editor free during the interviews to help answer any questions and provide quality control to data collection procedures. Youth were sent to the facilities for a variety of property, person, drug, and status offenses. The vast majority of youth reported a history of involvement in delinquent behavior and the juvenile court spanning several years. Overall, more than 95% of those referred to the research team assented to and completed the interview at both facilities. Overall, the characteristics of the study sample are representative of previous studies of residentially incarcerated youth nationally with regard to average age, race and ethnicity, and offense histories (Sickmund, 2004) and in terms of their social, behavioral, and delinquency histories (Blomberg, Bales, Mann, Piquero, & Berk, 2011; DeLisi et al., 2010; Mears, Cochran, Greenman, Bhati, & Greenwald, 2011; Reynolds, Tarter, Kirisci, & Clark, 2011; Trulson, Haerle, DeLisi, & Marquart, 2011; Trulson et al., 2012).

Measures

Total delinquency and serious violence. Delinquency and serious violence were assessed using the Self-Report of Delinquency (SRD). This measure assesses violent and nonviolent delinquent offending in the 12 months prior to residential placement. The SRD version employed was modeled after a similar measure used in the National Youth Survey (Elliott, Huizinga, & Menard, 1989). This instrument is well-established and has been in use for nearly 25 years. Items are assessed as counts using a scale of 0 = *never*, 1 = *1–2 times in the last year*, 2 = *1 time every 2–3 months*, 3 = *1 time a month*, 4 = *1 time every 2–3 weeks*, 5 = *1 time a week*, 6 = *2–3 times per week*, 7 = *1 time a day*, and 8 = *2–3 times a day*. Delinquent behaviors include assorted drug, property, and violent acts regarding whether a youth had stolen a motor vehicle, stolen items worth more than \$50, stolen drugs,

carried a weapon, and had attacked someone ($M = 15.29$, $SD = 13.16$, range = 0–65). Serious violence ($M = 8.94$, $SD = 7.84$, range = 0–35) was measured with a 5-item scale that included serious violent acts including gang fighting, hitting a teacher, hitting a parent, hitting other students, and attacking another person (average interitem covariance = .87, $\alpha = .63$).

Violent video games. Video game measures included a multiplicative measure of the frequency of playing multiplied by the violent content of the youth's top three favorite games. Participants were queried how often they played these video games using a scale of 4 = *almost every day*, 3 = *about 2–3 times a week*, 2 = *about once a week*, 1 = *a couple of times a month*, 0 = *I almost never played this game and how violent the games were* 3 = *very violent*, 2 = *pretty violent*, 1 = *a little violent*, and 0 = *not at all violent* ($M = 13.16$, $SD = 7.52$, range = 0–36). An attitudinal measure of how much the youth enjoys playing video games with violence in them (*not at all* = 1 . . . , *a lot* = 5; $M = 3.59$, $SD = 1.50$), an attitudinal measure of how much the youth enjoys playing video games where characters are nice and try to help people ($M = 2.50$, $SD = 1.40$), the number of years the youth has played video games (in years) ($M = 6.65$, $SD = 0–19$), and total screen time per week (in hours) ($M = 9.93$, $SD = 7.11$, range = 0–40) were also included. This approach of measuring violent media exposure has been used successfully with children in other studies (Anderson, Gentile, & Buckley, 2007; Gentile, Lynch, Linder, & Walsh, 2004) and has been validated with child ratings correlating with expert ratings at .75 (Gentile et al., 2009).

Sociodemographics and juvenile court onset. To guard against the potential confounding effects of correlates of delinquency and violence, sex (55% male, 45% female), age ($M = 16.14$, $SD = 1.70$, range = 13–19), race (*non-White* = 0, *White* = 1, 77.4% non-White, 22.6% White), and the age of first juvenile court referral ($M = 13.99$, $SD = 1.73$, range = 9–17) were included in the multivariate models. Young age, minority status, male gender, and early onset (Collins, 2010; Diamond, Morris, & Caudill, 2011; Novak & Crawford, 2010; Tapia, 2010; Tarter, Kirisci, Mezzich, & Patton, 2011) have been shown to be predictive of delinquency and violence in juvenile justice samples and are important controls to include in multivariate models.

Psychopathy. Psychopathy is a personality disorder characterized by deficits in interpersonal, affective, behavioral, and lifestyle areas and it an important correlate of youth violence and juvenile justice (DeLisi, 2009; Ribeiro da Silva, Rijo, & Salekin, 2012; Vaughn & Howard, 2005). Psychopathy was assessed using the Youth Psychopathic Traits Inventory (YPI; Andershed, Herr, Stattin, & Levander, 2002) total score ($M = 105.74$, $SD = 20.92$, range = 53–189) which measures the affective, behavioral, and interpersonal components of the psychopathy construct. Reliability and validity of this instrument in assessing psychopathic features in children and adolescents are strong (Vaughn, Howard, & DeLisi, 2008).

Analytical Strategy

Negative binomial regression models were used because the dependent variables are counts where the distribution is overdispersed by higher values of the distribution and the variance exceeds the mean. Negative binomial regression is an extension of Poisson regression which similarly estimates count-based outcome variables, but when the mean and variance are equal. The behavioral and attitudinal violent video game measures were correlated ($r = .23$, $p < .0003$) which permitted a slightly more conservative test of video game effects since they share variance. All models were executed with bootstrap standard errors and 1,000 replications in STATA 9.2.

Table 1. Negative Binomial Regression Model for Total Delinquency

Variable	<i>b</i>	BSE	<i>z</i>	95% CI
Screen time	-.005	.007	-0.62	[-.019, .010]
Violent video game play	.013	.006	2.00*	[.000, .025]
Violent video game attitude	.112	.041	2.72*	[.031, .194]
Prosocial video game attitude	-.031	.046	-0.68	[-.121, .059]
Years playing video games	-.014	.015	-0.95	[-.044, .015]
YPI total score	.017	.003	5.29*	[.010, .023]
Sex	-.077	.101	-0.76	[-.275, .122]
Age	-.043	.036	-1.18	[-.114 to .028]
Race	-.053	.160	-0.33	[-.366, .260]
Juvenile court onset	-.032	.040	-0.81	[-.110, .046]
Log likelihood	-797.47	—	—	—
Constant	1.78	1.04	1.71	[-.255, 3.82]

Note. YPI = Youth Psychopathic Traits Inventory.

* $p < .05$.

Table 2. Negative Binomial Regression Model for Total Violence

Variable	<i>b</i>	BSE	<i>z</i>	95% CI
Screen time	.002	.009	0.22	[-.016, .021]
Violent video game play	.015	.006	2.30*	[.002, .027]
Violent video game attitude	.140	.051	2.72*	[.039, .241]
Prosocial video game attitude	-.018	.037	-0.45	[-.091, .054]
Years playing video games	-.026	.017	-1.50	[-.060, .008]
YPI total score	.012	.003	3.35*	[.005, .019]
Sex	.122	.124	0.99	[-.120, .365]
Age	-.052	.040	-1.29	[-.130, .027]
Race	-.072	.164	-0.44	[-.394, .250]
Juvenile court onset	-.049	.036	-1.38	[-.119, .020]
Log likelihood	-691.61	—	—	—
Constant	1.87	1.03	1.81	[-.150, 3.88]

Note. YPI = Youth Psychopathic Traits Inventory.

* $p < .05$.

Results

Table 1 displays the negative binomial regression model for total SRD. Three significant effects were found. Frequency of violent video game play (coefficient = .013, $z = 2.00$) and an attitudinal measure of how much the youth likes to play video games with violence in them (coefficient = .112, $z = 2.72$) were significantly associated with total delinquency. The remaining and largest effect was YPI total score (coefficient = .017, $z = 5.29$). Overall model fit was significant (Wald $\chi^2 = 73.06$, $p < .000$) and the negative binomial model fit to the data was excellent ($\chi^2 = 1190.60$, $p < .000$).

Table 2 displays the negative binomial regression model for self-reported violent delinquency. Three significant effects were found. Frequency of violent video game play (coefficient = .015, $z = 2.30$) and an attitudinal measure of how much the youth likes to play video games with violence in them (coefficient = .140, $z = 2.72$) were significantly associated with total delinquency. The remaining and largest effect was YPI total score (coefficient = .012, $z = 3.35$). Overall model fit

was significant (Wald $\chi^2 = 43.94$, $p < .000$) and the negative binomial model fit to the data was excellent ($\chi^2 = 636.07$, $p < .000$).

Discussion

Although the role of media violence in affecting psychological variables such as thoughts, feelings, and aggressive behaviors is well-established (Anderson & Bushman, 2002b; Bushman & Anderson, 2009), its relation to the psychopathology of serious juvenile offenders is only beginning to be understood. The present data show that playing violent video games and/or having a preference for violent video games is correlated with delinquency and violence even when considering the effects of a battery of correlates of delinquency including psychopathy—a construct whose relation to crime is so robust it has been likened to a unified theory of crime (DeLisi, 2009).

It is important to acknowledge that the current data are limited by their cross-sectional nature. A prospective, longitudinal design where delinquents are followed over time to examine ways that their violent video game playing (and other behaviors) impacts their subsequent behavior was not possible, and such a design is an important avenue for future research. Nevertheless, although such cross-sectional data do not, by themselves, demonstrate a causal relation between violent video game exposure and violent criminal behavior, they rule out the alternative explanation that the association is merely the result of a confound with some other indicator of antisociality (in the current models, psychopathy and other important correlates of delinquency and youth violence). At a minimum, the present results—in combination with other robust findings on video games and aggression (Anderson et al., 2010)—suggest that violent video game exposure may be one risk factor for delinquency and violent criminal behavior among juvenile justice-involved youth in addition to being a risk factor for lower level aggressive behaviors.

Although the study of serious, violent, and chronic juvenile delinquency is a central research area in criminology and criminal justice, it has developed in almost complete isolation from the psychological study of violent video games and aggression. In this sense, the current study serves as a bridge to connect these literatures. Such a connection can enhance both literatures. On one hand, the use of clinical samples of juvenile delinquents allows researchers to control for the relative effects of media variables and delinquency history, personality, and other risk factors. This benefits psychology. On the other hand, the addition of violent video game playing and attitudes toward violent video games provides two additional risk factors that are associated with violence and delinquency. Indeed, only psychopathy and the violent video game measures in the current models were significantly associated with the outcome measures. This benefits criminology and criminal justice.

What are the implications of the current study for juvenile justice practice? We are reluctant to be too bold with policy recommendations given the newness of the research area vis-à-vis serious juvenile delinquents; however, there are considerations to be heeded. It is estimated that children in the general population consume on average roughly 3 hr of electronic media, such as video games every day (Weiss, Baer, Allan, Saran, & Schibuk, 2011). This is a population average that encompasses the majority of youth who are mostly prosocial and engage in relatively few maladaptive behaviors. The estimate of daily electronic media consumption among youth in the psychiatric population is 6 hr per day (Weiss et al., 2011). The average amount of screen time among youth in the current sample was nearly 10 hr of screen time per week, with the most frequent users reaching 40 hr of electronic media per week. A substantial part of this screen time is devoted to violent video games which were shown to be associated with serious delinquency and serious violence. Juvenile justice practitioners who supervise youth in any context should be aware of this important risk factor.

One reason for the popularity of video games is that their consuming nature provides quiet baby-sitting for adults whether the adults are parents at home, school resource officers monitoring students at school, juvenile probation officers checking the daily activities of their clients, or clinical social

workers monitoring youth in residential treatment. The consumption of violent media is far from innocuous, and when violent media consumption in the form of video games is viewed by adults as a “reward” for youth to spend their free time, it can be problematic. Youth with pre-existing psychopathology are particularly at risk for the deleterious effects of violent video games, and much more research is needed on correctional samples of youth to ascertain the severity of violent video games and related media factors as risk factors for their behavioral problems.

To our knowledge, these data are the first to examine the relations between violent video games and serious offenses among an adjudicated sample. All other studies focus on general population samples and most focus on lower level aggressive behaviors. These data are therefore valuable because they begin to fill the apparent gap that exists between those who have been convinced by the data on violent video games and those who have not. They also provide data that would be more relevant in a legal or policy context because they focus on the types of behaviors that policy makers, parents, and juvenile justice practitioners care about most.

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