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EMPIRICAL RESEARCH

Associations Between Violent Video Gaming, Empathic Concern, and Prosocial Behavior Toward Strangers, Friends, and Family Members

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Abstract Exposure to media violence, including violent video gaming, can have a cognitive desensitization effect, lowering empathic concern for others in need. Since emerging adulthood offers increased opportunities to volunteer, strengthen relationships, and initiate new relationships, decreases in empathic concern and prosocial behavior may prove inhibitive to optimal development during this time. For these reasons, the current study investigated associations between violent video gaming, empathic responding, and prosocial behavior enacted toward strangers, friends, and family members. Participants consisted of 780 emerging adults (M age = 19.60, SD = 1.86, range = 18–29, 69% female, 69% Caucasian) from four universities in the United States. Results showed small to moderate effects between playing violent video gaming and lowered empathic concern for both males and females. In addition, lowered empathic concern partially mediated the pathways between violent video gaming and prosocial behavior toward all three targets (at the level of a trend for females), but was most strongly associated with lower prosocial behavior toward strangers. Discussion highlights how violent video gaming is associated with lower levels of prosocial behavior through the mechanism of decreased empathic concern, how this association can affect prosocial behavior differently across target, and finally what implications this might have for development during emerging adulthood.

Keywords Emerging adulthood · Media violence · Video games · Empathy · Prosocial behavior

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Introduction

With regard to optimal child development, researchers have been studying media violence for decades, with a particular focus on the effects of television and movies. Video game violence is really the "new kid on the block" when it comes to the media violence literature, having only emerged in the late 1980s and early 1990s (Anderson et al. 2010). In 1972, the Magnavox Odyssey was released in the United States as the first home "console" system, selling about 100,000 consoles in its first year. A few other home gaming systems also were produced in the early 1980s. Following a crash in the video game industry in 1983, the Nintendo Entertainment System was then released in 1985 and met widespread success. In fact, that first Nintendo came bundled with many video games that are still popular today (e.g. Super Mario Bros., The Legend of Zelda, Final Fantasy), although the initial versions of the games are far different from the ones being played now. Since that time, graphics, narratives, and special effects have become increasingly realistic, adding to the appeal of interactive games (Funk 2002; Sherry 2001). In response, recent estimations have shown that over 90% of America's children and adolescents own a video gaming system and over 60% play video games for at least 30 min a day, although this effect is moderated by gender in that boys play for about an hour per day, while girls play for under 15 min per day (Kaiser Family Foundation 2010). Thus

video gaming has come a long way in its technological advances as well as its growing influence in the lives of children and adolescents.

Although the study of violent video gaming has been primarily focused on younger age groups, frequency of video gaming increases around age 18 (Anand 2007), and peaks in the twenties (ESA 2011). While the Entertainment Software Association (2011) notes that the majority of players are male, they also remark that 37% of the game-playing population is female and that adult women are one of the industry's fastest growing demographics. In addition, recent data showed that 85% of male and 47% of female emerging adult college students reported playing video games, with almost 35% of males playing daily (Padilla-Walker et al. 2010). This means that the largest group of consumers are emerging adults, or individuals ages 18 through the mid to late twenties. Emerging adulthood is a developmental time period characterized by increased identity exploration, relationship formation, and social understanding (Arnett 2004; Collins and Madsen 2006). Video games represent a socializing agent during this formative period, with the potential to influence many developmental domains, including self-perception, aggression, relationship quality, risk-taking, and gender stereotyping (Behm-Morawitz and Mastro 2009; Padilla-Walker et al. 2010). The most popular games among young adults (particularly males) contain high amounts of violence (National Institute for Media and the Family 2002). Since violent video gaming has become so prevalent in American society, it has become necessary to investigate the effects that violent video gaming may have on emerging adults' cognitive functioning and social behavior. Thus, the current study examines the associations between violent video gaming, emerging adults' empathic concern, and prosocial behavior.

Violent Video Gaming

College students report playing different kinds of video games and also give multiple explanations for why they play them. With regard to preference, the primary games being sought out for play among this age group contain some degree of violence, with over half of the top games and 80% of all games released in 2010 containing violent content (ESA 2011; Funk 2002). Violent video games in particular are sought out for a variety of reasons, including pride in accomplishment, ability to vicariously experience other places and times, to engage in violence that is not real (Funk et al. 2006; Klug and Schell 2006), and as a means of arousal, challenge, diversion, social interaction and competition (Sherry et al. 2006). Indeed, while the most popular games seem to be violent ones, the explanations for playing them seem to vary widely.

Although definitions and descriptions of video game violence often differ, most publications and researchers note that violent games emphasize negative story lines and destructive actions (Funk 2002; Klimmt 2004; Smith et al. 2003), although some research has shown that these do not necessarily translate into destructive behavior (Ferguson et al. 2009). In a comprehensive study on the amount and context of violence in state-of-the-art video games (60 games), researchers defined aggression in games as, "a human perpetrator engaged in repeated acts of justified violence involving weapons that result in some bloodshed to the victim" (Smith et al. 2003, p. 60). Modern games generally include very realistic interpretations of human violence. For example, multiple popular games give reward points for assaulting other characters and making a homicide appear more gruesome on screen (Weber et al. 2006). Additionally, Haninger and Thompson (2004) found that almost all T (Teen)-rated games (90%) required the player to injure other characters and 69% of the games required or rewarded the killing of other characters. These actions closely mimic real-life violence that would not be acceptable or permitted on college campuses or in most communities.

Although findings are mixed on outcomes of violent video gaming, there have been a number of studies examining various associations. For example, a pattern of violent video gaming was associated with decreased SAT scores (Anand 2007) and greater drug use, drinking behavior, and number of sexual partners, along with lower relationship quality, self-worth, and perceived social acceptance in emerging adulthood (Padilla-Walker et al. 2010). The most recent meta-analysis on violent video gaming revealed that exposure led to increases, although small, in aggressive behavior, cognition, and affect, while decreasing prosocial behavior and empathy (Anderson et al. 2010). However, as with most controversial issues in the social science field, there is another side to the debate on the effects of video game violence. Indeed, some researchers postulate that the concern over violent video gaming is just the latest topic for "moral crusaders" to facilitate a panic over (Cumberbatch 2008; Ferguson 2010). This claim is not unfounded, as a growing body of research shows that violent video gaming is, in fact, not linked to increased aggression (Baldaro et al. 2004; Ferguson et al. 2009; Williams and Skoric 2005), is linked to reductions in aggression (Barnett et al. 2008), or has links to increased aggression that are too minimal to be considered influential (Sherry 2001). Indeed, these findings show that not all associations are negative and violent video gaming may even be related to positive outcomes.

Ferguson (2010) also writes that, in the media violence studies conducted to date, "claims of causal certainty are unprecedented" (p. 72). This statement is supported by pointing out that while researchers have claimed that violent video gaming is a powerful predictor of adolescent violence (Grossman and Degaetano 1999), there actually have been significant declines in youth violence rates since 1993 (Ferguson 2010). Others have reported that video

gaming, despite violent content, offers positive benefits that are largely ignored, including civic engagement, social interaction, and better adjustment (Durkin and Barber 2002; Lenhart et al. 2008). Finally, it also has been argued that influences more proximal to youth (peer influence, home environment, etc.) will have greater effects on behavior than will media outlets (Beaver et al. 2009; Pinker 2002). While it is necessary to note that the impact of video gaming is still in need of greater empirical and theoretical clarity, most of these studies and the bulk of research on violent video gaming in general debate over outcomes having to do with aggression rather than prosocial outcomes (such as prosocial behavior and empathic concern). However, according to desensitization theory (Rule and Ferguson 1986), it is likely that prosocial outcomes are also associated with gaming, and should thus be examined in greater detail.

Theoretical Foundation

Desensitization theory speculates that repeated exposure to violence in the media can lead to an attitude of "numbness" toward real-life violence, which is based upon the assumption that humans have innately negative physiological and psychological reactions to observed violence. Rule and Ferguson (1986) then point out that *desensitization* is the habituation or attenuation of distressing reactivity to observed violence due to exposure to violence either in real-life or in the media. The General Aggression Model (GAM; Bushman and Anderson 2009) expands upon this theory, while recognizing that subsequent behavior after violent media exposure is a complicated process involving both personality and situational characteristics. Relevant to the current study, in the short term, exposure to violent video gaming may influence a person's internal state, perhaps by dulling affect and diminishing arousal for habitual players. This altered state may then influence behavior in subsequent situations, perhaps inhibiting the appraisal and decision making process leading to inactivity and general apathy concerning others in need. In the long term, the GAM suggests that repeated exposure to violent video games can shape an individual's personality regarding aggressive behavior (and on the flip side, prosocial behavior), by shaping cognitive scripts regarding aggression, leading the individual to habitually become less concerned with the violence around them.

Accordingly, the above theories suggest that when an individual, regardless of age, is habitually exposed to violent media, the intense, aversive cognitions and emotions that would normally accompany such violence are abated. Violence can then be seen as mundane and commonplace, leading to a heightened likelihood of violent thoughts and actions as well as decreases in prosocial attitudes, including empathic concern (Anderson et al. 2003; Huesmann et al. 2003; Sparks and Sparks 2002). As empathic concern allows an emerging adult to identify with another and commiserate with them on an emotional level (Howard and Walsh 2010), it is often seen as a precursor to helping behavior (Karniol and Shomroni 1999). Thus, the current study used the framework of desensitization theory and the GAM to suggest that violent video gaming would be associated with lower levels of empathic concern, which would be related, in turn, to lower levels of prosocial behavior. In addition to examining the mediating role of empathic concern, the current study also sought to examine different targets of prosocial behavior (strangers, friends, and family) to determine if this process works differently as a function of the target of the behavior.

Prosocial Behavior

Prosocial behavior is defined as any voluntary behavior primarily aimed at benefitting another (Eisenberg et al. 2006; Staub 1978). Youth and emerging adults who engage in prosocial behavior are more likely to possess high self-efficacy and self-esteem, to have prosocial self-schemas, and to experience increased social concern (Cauley and Tyler 1989; Laible et al. 2004). Behavioral correlates of prosocial behavior include decreases in academic problems, truancy, suspension, school drop-out, and teen pregnancy (Allen et al. 1997; Moore and Alenn 1996). Prosocial behavior also has been negatively related to anger, fear, anxiety, and sadness (Bandura et al. 2001; Diener and Kim 2004; Eisenberg et al. 1996). Thus prosocial behavior is generally considered a positive developmental attribute during the formative years and emerging adulthood.

Since there are increases in emotional maturity, including empathic concern, during emerging adulthood (Batson et al. 2003; Eisenberg et al. 1991; Steinberg 2005), as well as increased interpersonal relationships and exposure to new people and ideas (especially for college students), opportunities for prosocial behavior may be more salient during this developmental time period than during the formative years. In fact, the variety of opportunities for prosocial behavior increases during emerging adulthood (Fabes et al. 1999), with many emerging adults volunteering their time and skills to global humanitarian associations. For example, most of the volunteers in the Americorps and Peace Corps are emerging adults (http://www.cns.gov/americorps; http://www.peacecorps.gov), which may be a function of this time period being one in which there are fewer commitments to others relative to adulthood (e.g., marriage, parenting), allowing the possibility of helping in more time consuming ways. That being said, most of the research done on prosocial behavior has examined helping behaviors enacted toward strangers (Einolf 2010; Eisenberg et al. 2006; Staub 1995),

although most people are more likely to help those who are relatively important in their lives, such as family members and friends (Eberly and Montemayor 1998, 1999; Killen and Turiel 1998; van der Mark et al. 2002; Young et al. 1999). Indeed, Natel-Vivier et al. (2009) postulated that, as they get older, adolescents' prosocial responding becomes more selective and focused in nature, even rendering helping behaviors more "private" over time as teens become more involved with affiliated groups (e.g. family, friends). Since this same trend is likely to continue into emerging adulthood, it is important to investigate the nature of the recipients of prosocial behavior during this time. Prosocial behavior also has been associated with positive outcomes for emerging adults, with those who display high levels of altruism also showing high levels of moral reasoning, reduced aggression, and reduced risk taking behaviors (Carlo and Randall 2002; Nelson and Barry 2005). As emerging adults participate in prosocial behavior, they also are displaying greater relational maturity through establishing an identity that is more focused on others rather than on the self (Nelson et al. 2007; Padilla-Walker et al. 2008).

Given the importance of prosocial behavior, desensitization to violence as a result of repeated exposure to violent video games is important to consider because it could influence a person's willingness to respond to others in need (Funk 2005). Researchers have shown that violent video gaming was significantly related to lower levels of prosocial behavior across multiple studies (Anderson et al. 2010). In one study (Bushman and Anderson 2009), after playing violent video games in a laboratory setting, a fake fight was staged outside the lab door. Those who played a violent game took over 450% longer to help the stranger, were less likely to even notice the fight occurred, and rated the fight as less serious. These findings again show that repeated violent video gaming may have negative consequences among an emerging adulthood population, possibly reducing prosocial behavior. However, we know little about how exposure to violence might impact prosocial behavior toward different targets, including strangers, friends, and family members. We also know little about the mechanisms through which violent video gaming influences prosocial behavior, and the current study proposes that gaming may impact outcomes inasmuch as it is associated with the desensitization of one's empathic responses.

Empathic Concern as a Mediator

Empathy toward others can be described as an emotional reaction elicited by and parallel to another's emotional state (Eisenberg et al. 1991), which often is manifested as a sympathetic response that leads to feeling bad for another's situation and acting on those feelings. Sympathy and empathic concern are terms that are often used interchangeably, but the current study will primarily use the term empathic concern to refer to the sympathetic emotional manifestation of an initial empathic response. In adolescence and emerging adulthood, higher levels of empathic concern or the broader construct of empathy have been linked to lower levels of antisocial behavior, including bullying (Boswell 2010), cyberbullying (Ang and Goh 2010), racial discrimination (Weyant 2007), theft and vandalism (Carrasco et al. 2006), aggression (Lovett and Sheffield 2007) and delinquency (Hunter et al. 2007). In addition, higher levels of empathic concern or empathy have been correlated with a host of positive developmental characteristics, including humor, forgiveness, and gratitude (Hampes 2001; Miley and Spinella 2006), as well as prosocial behavior (Findlay et al. 2006; Tur et al. 2004), particularly toward strangers and friends (Padilla-Walker and Christensen 2011). In order for an individual to act prosocially, he or she must first notice that another is in need, recognize an event as urgent, and then feel a personal responsibility to help (Bushman and Anderson 2009). Accordingly, high levels of empathic concern allow an individual to gather information about another, predict what that person is feeling, share in those feelings, and then assist him or her (Karniol and Shomroni 1999). Indeed, empathic concern has been shown to be a consistent mediator between parental socialization and prosocial behavior (Carlo et al. 1999; Gehlbach 2004; Reimer 2001; Padilla-Walker and Christensen 2011), but we are not aware of any studies that have examined empathic concern as a mediator between media socialization and prosocial behavior.

In a recent meta-analysis, violent video gaming was found to be significantly related to lower levels of empathic concern regardless of the research design (cross-sectional, longitudinal, experimental, etc.) or age group (Anderson et al. 2010). Congruently, long term exposure to violent video games has been associated with lower levels of empathic concern in a number of studies looking at children (Funk et al. 2003, 2004; Wei 2007). However, and as mentioned, none of these studies took into account empathic concern as a mediator or the target of the prosocial behavior.

Hypotheses

Although it is difficult to make specific predictions as a function of the gaps in the current literature, based on existing findings and the theoretical construct of desensitization (Anderson et al. 2003; Rule and Ferguson 1986), we hypothesized that violent video gaming would be negatively associated with prosocial behavior enacted toward strangers, friends, and family members. Furthermore, we hypothesized that violent video gaming would have the greatest negative association with prosocial behavior enacted toward strangers, since violent video

games portray characters that are unfamiliar to the player. In addition we predicted that empathic concern would at least partially mediate the relationship between violent video gaming and prosocial behavior toward all targets. Again, we expected that the strongest effects would be seen in the relationships between empathic concern and prosocial behavior toward strangers, since greater empathic concern may be required to help an unknown other (Padilla-Walker and Christensen 2011) as opposed to helping a familiar person where prosocial behavior would be grounded in a well-established relationship (Natel-Vivier et al. 2009).

In each of these cases, the associations were examined as a function of gender, as previous research has indicated that males may seek out and play more violent video games than do females (Gentile et al. 2009; Padilla-Walker et al. 2010; Rideout et al. 2005). However, although video gaming interferes more with college life (sleep patterns and class attendance) among males than females (Ogletree and Drake 2007), recent reports indicate that the *effects* of violent video gaming on aggression and prosocial behavior do not differ by gender (Anderson et al. 2010). Regarding empathic concern, researchers have shown that females are consistently more empathetic than males across all areas of social sensitivity (Derntl et al. 2010), and that females show higher levels of prosocial behavior than do males (Carlo et al. 2001). However, the *effects* of empathic concern on prosocial behavior generally do not differ as a function of gender. Given these findings, it is possible that, although mean differences between genders are apparent for violent video gaming, empathic concern, and prosocial behavior, the patterns between these variables may not differ across gender. The current study was exploratory on this point.

Methods

Participants

The participants for this study were selected from an ongoing study of emerging adults entitled Project Ready (Researching Emerging Adults' Developing Years). This project is a collaborative multisite study that is being conducted by a consortium of developmental and family scholars. Participants consisted of 790 undergraduate students (547 women, 243 men) recruited from four college sites across the country: a mid-sized East Coast private university, a large West Coast public university, a large Midwestern public university, and a large Southern public university. Participants ranged in age from 18 to 29, with the mean age being 19.6 years (SD = 1.86). Overall, approximately 69% of the participants were European American, 3% were African American, 18% were Asian American, 5% were Latino American, and 4% indicated that they were "mixed/biracial" or of another ethnicity. Most (98.4%) of the participants were unmarried (2.8% cohabiting with a partner in an intimate relationship), and 90% reported living outside their parents' home in an apartment, house, or dormitory.

Procedure

Participants completed the Project Ready questionnaire via the Internet (see http://www.projectready.net). The use of an online data collection protocol facilitated unified data collection across multiple university sites and allowed for the survey to be administered to emerging adults. Participants were recruited through faculty announcement of the study in undergraduate courses. Professors at the various universities were provided with a handout to give to their students that had a brief explanation of the study, as well as directions for accessing the online survey. Interested students then accessed the study web site with a location-specific recruitment code. Informed consent was obtained online, and only after consent was given could the participants begin the questionnaires. Participants were offered $20 for their participation.

Measures

Violent Video Gaming

Violent video gaming was assessed by asking participants how many days in the past 12 months they had played violent video games either on- or off-line. Participants responded to this item on a 6-point Likert scale with possible answers being (1) none; (2) once a month or less; (3) 2 or 3 days a month; (4) 1 or 2 days a week; (5) 3 to 5 days a week; or (6) every day or almost every day. A similar question using the same scale was asked regarding overall video gaming. This variable was then used in the structural equation model as a control variable in order to parcel out the specific effects of violent video gaming. It should be noted that we did not specifically define violent video games to participants. Justification for this comes from other studies where prominent video game researchers have allowed participants to use their own judgment to rate media violence. In fact, self-report methods of rating video game violence has been validated even with children, as their ratings of violence have correlated with experts' ratings of violence at .75 (Anderson et al. 2007; Gentile et al. 2009).

Empathic Concern

Participants' empathic concern was examined using a shortened version of the empathic concern subscale of the

Interpersonal Reactivity Index (Davis 1983). Participants responded to five items ($\alpha = .75$) on a 5-point Likert scale ranging from 1 (*not like me at all*) to 5 (*very much like me*). One sample question included, "I am often quite touched by the things that I see happen to others." Empathic concern was then reverse coded, with higher scores indicating lower empathic concern. This was done to be consistent with desensitization theory, which states that violent media increases the cognitive "numbness," or lack of empathic concern, that players may acquire.

Prosocial Behavior

Participants' personal characteristics were examined by assessing their character strengths using the Kindness/Generosity Subscale (Peterson and Seligman 2004). Participants responded to items on a 5-point Likert scale ranging from 1 (*not like me at all*) to 5 (*very much like me*). This 15-item measure was broken down into three subscales, assessing prosocial behavior toward strangers, friends, and family members. A sample question for strangers included, "I go out of my way to cheer up people who seem sad, even if I do not know them." A sample question for friends included, "I help my friends, even if it is not easy for me." A sample question for family members included, "I voluntarily help my family members with things they need." Internal consistency of these scales was adequate, with Cronbach's alpha ranging from .85 to .93.

Results

Descriptive Statistics and Correlations

Bivariate correlations, means, and standard deviations of all study variables (separately for males and females) can be seen in Table 1. Frequencies were also run to better understand the distributions across variables. Findings suggested that males played violent video games more often than did females. In fact, 81.5% of females in the sample reported that they did not play violent video games at all. In contrast, the distribution across violent video gaming for males was normal, with no significant outliers. Across the other variables in the model, *t* tests indicated that females ($M = 1.88$, $SD = 0.73$) had significantly lower scores than males ($M = 2.34$, $SD = 0.80$) on the reverse scored empathic concern variable, $F(1,788) = 64.16, p = .001$ (thus females had higher empathic concern). Males also exhibited significantly lower levels of prosocial behavior than did females did toward strangers ($M = 3.35$, $SD = 0.75$ [3.66, 0.69]), $F(1,788) = 16.58, p < .001$, friends ($M = 4.01, SD = 0.73$ [4.39, 0.53]), $F(1,788) = 23.43$, $p < .001$, and family members ($M = 3.99$, $SD = 0.81$ [4.36, 0.63]), $F(1,788) = 47.62, p < .001$.

Empathic Concern as a Mediator Between Violent Gaming and Prosocial Behavior

Analyses were conducted using Analysis of a Moment Structure (AMOS) 18.0 software (Arbuckle 2010) to perform structural equation modeling (SEM). First, a measurement model was conducted with the four latent variables, namely, empathic concern and prosocial behavior toward strangers, friends, and family members. To test for latent variable invariance as a function of gender, multigroup models were estimated and compared using χ^2 difference tests. Standard procedures were used in AMOS to examine invariance in the latent variables across intercepts, factor loadings, and residual variances (see Arbuckle 2010), and revealed that model fit was best when factor loadings, intercepts, and residuals were all allowed to vary across groups. The unconstrained model led to acceptable fit, $\chi^2 = 386.657$, $df = 226$, $p < .001$; CFI = .979; TLI = .968; RMSEA = .030, and showed that for males, low empathic concern was correlated with prosocial behavior toward strangers ($r = -.75$), friends ($r = -.56$),

Table 1 Bivariate correlations, means, and standard deviations for violent video gaming, low empathic concern, and prosocial behavior toward strangers, friends, and family members

	1	2	3	4	5	6	*M*	SD
1. Violent video game use	–	.16***	−.14**	.00	−.15***	.56***	1.33	0.82
2. Low empathic concern	.03	–	−.60***	−.43***	−.31***	.15***	1.88	0.73
3. Prosocial behavior: strangers	−.02	−.62***	–	.41***	.28***	−.12**	3.66	0.69
4. Prosocial behavior: friends	−.01	−.52***	.56***	–	.43***	−.05	4.39	0.53
5. Prosocial behavior: family	−.04	−.40***	.48***	.55***	–	−.09*	4.36	0.63
6. Video game use (control variable)	.80***	.08	.03	.04	.07	–	2.00	1.27
M (males)	3.39	2.34	3.35	4.01	3.99	3.88		
SD (males)	1.68	0.80	0.75	0.73	0.81	1.62		

Correlations below the diagonal are for males, above the diagonal are for females

* $p < .05$; ** $p < .01$; *** $p < .00$

and family members ($r = -.44$). In addition, prosocial behavior toward strangers was correlated with prosocial behavior toward friends ($r = .42$) and family members ($r = .33$), which were also correlated ($r = .44$). For females, low empathic concern was correlated with prosocial behavior toward strangers ($r = -.71$), friends ($r = -.53$), and family members ($r = -.35$) while prosocial behavior toward strangers was correlated with prosocial behavior toward friends ($r = .21$) and family members ($r = .07$), which were also correlated with one another ($r = .37$).

Next, a structural model was constructed with empathic concern as a mediator between violent video gaming and prosocial behavior toward the three targets. Overall video gaming was used as a control in the model, but was not shown in the figure for parsimony. To test for path differences as a function of gender, each path was constrained across groups and χ^2 difference was calculated. Only two path constraints lead to a reduction in model fit, so the structural model was allowed to vary across groups on those two paths, from overall video gaming (control variable) to low empathic concern and from low empathic concern to prosocial behavior toward family. This final model yielded acceptable fit $\chi^2 = 486.323$, $df = 297$, $p < .001$; CFI = .977; TLI = .970; RMSEA = .029.

Results suggested that there was a negative association between violent video gaming and prosocial behavior toward family ($\beta = -.13$ [−.09], $p < .01$), but not toward strangers or friends. In addition, violent video gaming was positively associated with low empathic concern for males and females ($\beta = .23$ [.14], $p < .01$), and low empathic concern was subsequently negatively associated with prosocial behavior toward strangers ($\beta = -.75$ [−.71], $p < .001$), friends ($\beta = -.56$ [−.53], $p < .001$), and family members ($\beta = -.44$ [−.35], $p < .001$). All regression weights can be seen in Fig. 1. To determine whether the strength of paths between empathic concern and prosocial behavior were statistically different as a function of target, paths were constrained (one at a time) to be equal across targets and χ^2 differences were calculated. These analyses revealed that the path between low empathic concern and prosocial behavior toward strangers was stronger than paths from empathic concern toward friends and family (for both males and females). Maximum likelihood bootstrapping with a 95% confidence interval (see Shrout and Bolger 2002) was used to test mediation and revealed that all of the standardized indirect (mediated) effects were significant for males ($p < .05$), but were only significant for females at the level of a trend ($p = .07$). See Table 2.

As previously mentioned, overall video gaming was used in the current model as a control variable. Analyses showed that overall video gaming was correlated negatively with low empathic concern ($\beta = -.26$, $p < .01$) for males. Because this was not the pattern shown in bivariate correlations, it was determined to be a suppression effect (for males only). McNemar (1969) explained that a suppressant is a variable that has no elements in common with the outcome variables but does have elements in common

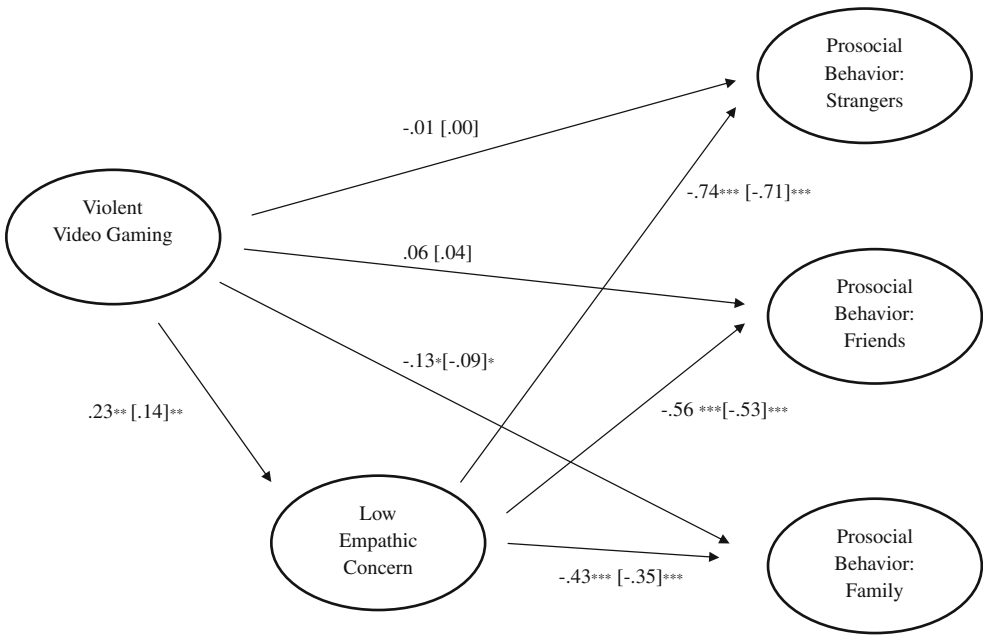

Fig. 1 Direct and indirect effects of violent video gaming on prosocial behavior toward strangers, friends, and family members as mediated by low empathic concern. Regressions are reported for males and [females]. Omitted from the figure for parsimony are latent variable and endogenous error correlations. *$p < .05$; **$p < .01$; ***$p < .001$

Table 2 Direct and indirect effects of violent video game use on prosocial behavior toward strangers, friends, and family members reported for males and [females]

Outcome variable	Predictor variable	Direct effects	Indirect effects	Total effects
Prosocial behavior: strangers	Violent video gaming	.00 [.00]	−.17*** [−.10†]	−.17*** [−.10†]
	Low empathic concern	−.74*** [−.71***]	–	−.74*** [−.71***]
Prosocial behavior: friends	Violent video gaming	.06 [.04]	−.12** [−.07†]	−.06 [−.03]
	Low empathic concern	−.56*** [−.53***]	–	−.56*** [−.53***]
Prosocial behavior: family	Violent video gaming	−.13† [−.09*]	−.10** [−.05†]	−.23* [−.14*]
	Low empathic concern	−.43*** [−.35***]	–	−.43*** [−.35***]

† $p < .07$; * $p < .05$; ** $p < .01$; *** $p < .001$

with the predictor variable. When the predictor and suppressant are positively correlated, which they are in this case ($r = .80$, $p < .001$), then the irrelevant elements of the predictor variable are parceled out, which "purifies" the predictor and improves the prediction. In this case, when the two variables are entered simultaneously in the model, the extensive overlap between video gaming and violent video gaming essentially parcels out the effects of violence in the control variable, resulting in a negative association between overall video gaming and low empathic concern. In other words, it appears that perhaps video gaming contains information that is positively (e.g., violent video games) as well as negatively (e.g., non-violent video games) related to low empathic concern, so when violent video gaming is assessed in the same model as overall video gaming, it accounts for the negative information and then all that is left is the positive information included in video gaming (which is then negatively related to low empathic concern). The impact of the control on the predictor variable is similarly explained. To be sure that the suppression effect was not distorting the significance of the structural pathways in the model, partial correlations by gender were run in SPSS between violent video gaming and low empathic concern while controlling for overall video gaming, as well as between overall video gaming and low empathic concern while controlling for violent video gaming. Results confirmed that for males, both overall video gaming (−.16) and violent video gaming (.14) had significant effects on low empathic concern in the same direction found in the SEM model, indicating that the regression paths could be trusted.

Discussion

The purpose of the current study was to examine empathic concern as a mediator between violent video gaming and prosocial behavior toward three targets. Given the considerable controversy regarding the effects of violent video gaming (Anderson et al. 2010; Ferguson 2010) and the primary focus of current research on aggressive outcomes, the current study sought to examine the General Aggression Model with a sample of college students. The current study also sought to extend existing research in two ways. First, the link between violent video gaming and prosocial behavior always has been empirically tested as a direct association rather than an indirect one mediated by lowered empathic concern, as suggested in the GAM. Therefore, we sought to test the hypothesis that violent video gaming would be associated with decreases in prosocial behavior as a function of lowered empathic concern. Second, previous research has linked violent video gaming with decreases in prosocial behavior (Anderson et al. 2010), but we are not aware of any research investigating how violent video gaming might be differentially associated with prosocial behavior as a function of the target of the behavior. Our results added to the previous literature by supporting the GAM and also showed that violent video gaming was negatively associated with prosocial behavior toward strangers, friends, and family members.

Partially consistent with hypotheses, current analyses suggested that violent video gaming was indirectly (albeit weakly) associated (via empathic concern) with lower levels of prosocial behavior toward all targets (indirect effects were significant at the level of a trend for females), with the strongest effects being on prosocial behavior toward strangers. Consistent with previous research, effects were not particularly strong (Sherry 2001); however they still shed light on the psychological processes through which media violence might affect prosocial behavior during emerging adulthood, particularly for males. Indeed, our results suggest that violent video gaming is negatively associated with prosocial behavior during this important developmental time period.

Empathic Concern as a Mediator

As mentioned, violent video gaming has been linked to lower empathic concern and prosocial behavior separately

(Anderson et al. 2010), but these studies have not taken into account the relationship between empathic concern and prosocial behavior. Thus, the current findings extend existing research by suggesting that violent video gaming is not only linked to prosocial behavior and lower levels of empathic concern, but also linked to prosocial behavior *through* lower levels of empathic concern. Theoretically, this provides support for the GAM (Bushman and Anderson 2009), showing that during emerging adulthood in particular, the arousal brought on by media violence may gradually influence the internal state or personality of the player, which is then associated with decreases in helping behavior. Again, we would note that associations were not particularly strong, nevertheless they were statistically significant. It is also important to note that the cross-sectional nature of the current study precludes causal inferences; but given past experimental research suggesting causal relationships between violent video gaming and reductions in both empathic concern and prosocial behavior, future research should continue to examine empathic concern as a mediator between violent video gaming and prosocial behavior.

Targets of Prosocial Behavior

Although past research has found violent video gaming (Anderson et al. 2010) and empathic concern (Eisenberg et al. 2006) to be related to prosocial behavior, studies have primarily focused on prosocial behavior toward strangers. Thus, the current study added to existing research by suggesting that violent video gaming was indirectly associated with lower levels of prosocial behavior toward strangers, friends, and family members. However, it also suggested that violent video gaming had the strongest indirect effect on prosocial behavior geared toward strangers. This is likely the case because helping a stranger may be more motivated by empathic feelings than is helping someone with whom one has a relationship (Padilla-Walker and Christensen 2011). Indeed, often in an established relationship, such as a friendship or parent–child relationship, helping behavior is expected and may even be habitual (Eberly and Montemayor 1998, 1999; Kerr et al. 2003). However, approaching a complete stranger in need may be far more challenging, with the initiator having to navigate a novel situation without knowing how the help will be received. In this case, those individuals who naturally feel more other-oriented emotions, such as empathic concern or have a "prosocial disposition," are more likely to help strangers (Wentzel 2003).

During emerging adulthood, many helping situations are novel due to the transitory nature of the developmental time period (Arnett 2004). As emerging adults spend less time with family members and explore new college campuses or workplaces, they may be surrounded by strangers and increased opportunities may arise to help unfamiliar others. Although the long term impact of desensitization is unclear from the current findings, if violent video gaming is associated with a reduction in empathic concern, then emerging adults may miss out on opportunities to develop the mature, other-oriented identity that often is associated with prosocial behavior. This same other-oriented identity is a part of relational maturity, which is considered to be a key aspect of reaching adulthood (Nelson et al. 2008).

Although the indirect path from empathic concern to prosocial behavior toward strangers was the strongest, results suggested that violent video gaming was also related indirectly to prosocial behavior toward friends and family members, potentially showing the far-reaching impact of low levels of empathic concern. In addition, playing violent video games was directly and negatively associated with prosocial behavior toward family, even after adding empathic concern to the model, which may suggest that empathic concern mediates the relationship between violent video gaming and prosocial behavior more clearly when the behavior is aimed at friends and strangers. Indeed, it is possible that other mediators, such as the quality of the parent–child relationship, are more relevant in regard to prosocial behavior toward family members, as empathic concern is not shown to be as strong a predictor of prosocial behavior toward family as it is toward strangers and friends (Padilla-Walker and Christensen 2011). Another possibility, given the cross-sectional nature of the current data, is that those with low levels of prosocial behavior toward family (perhaps as a result of poor parent–child relationships) engage in higher levels of violent video gaming. Regardless of the direction of effects, the negative associations between violent video gaming and prosocial behavior may have implications for relationships with friends and family members, who continue to be central during this developmental time period (Mounts et al. 2006). Thus, future research should more carefully examine the relationships between violent gaming and prosocial behavior toward multiple targets, especially considering research that highlights the positive effects of video gaming on social interaction regardless of content (Barnett et al. 2008; Lenhart et al. 2008).

Gender Differences

Our model showed that while many relationships existed similarly for males and females, effects differed in strength when mediation was tested. Indeed, violent video game use was associated with lowered empathic concern equivalently for both males and females. Lowered empathic concern was then associated with prosocial behavior

toward all targets for both genders, although the relationship between empathic concern and lower levels of prosocial behavior toward family members was stronger for males than females. However, we found that our indirect relationships (between violent video gaming, empathic concern, and prosocial behavior) were significant for males, but only significant at the level of a trend for females. Despite the trend level in significance for females, these effects were not statistically significantly different as a function of gender, which suggests that our findings are generally consistent with Anderson et al. (2010) in that many associations were similar across gender, including the one between violent video gaming and empathic concern.

We also found that the negative relationship between the control variable (overall video game use) and low empathic concern was significantly stronger for males. For females, overall video gaming was not significantly associated with lower empathic concern, but for males, overall video gaming was negatively related to lower empathic concern. As previously mentioned, adding video game use to the model as a control variable essentially isolated the effects of violent video game use in the predictor variable. However, having both variables in the model also isolated the effects of non-violent video game use in the control variable, where we see the negative relationship with low empathic concern. We interpret this finding to mean that when males play non-violent video games (perhaps playing more neutral or even prosocial games), this may actually increase empathic concern. This coincides with previous research suggesting that video games can have positive effects (Durkin and Barber 2002; Ferguson 2010), but more especially that prosocial video games can have positive effects, even increasing cooperation and helping (Gentile et al. 2009; Greitemeyer and Osswald 2009). This finding indicates that video gaming is not wholly negative, although the finding that non-violent or prosocial video gaming may increase empathic concern is in need of further investigation.

Limitations, Future Research, and Conclusions

The current study is not without limitations. First, as mentioned, the current study was cross-sectional in nature, which does not allow for determining the direction of effects or causal relationships. Longitudinal data also would have been helpful in understanding the relationship between violent video game use and low empathic concern as previous research has shown that those with lower empathic concern (or empathy) also seek out violent media (Funk et al. 1998). In addition, the majority of the sample was female, which makes current findings potentially less generalizable to male college students. Although analyses were run separately by gender, having a more representative number of males in the study would have been preferable in comparing effects, particularly as males play more video games than do females (ESA 2011). Further, the current sample consisted of college students, and therefore may not be generalizable to a non-student population. There is still relatively little that is known about young people who do not attend college after high school, leading some to call this group the "forgotten half" (William T. Grant Foundation Commission on Work, Family, and Citizenship 1988). Young people who attend college tend to come from higher socio-economic status (SES) families (Pell Institute 2004) and research has shown that media use tends to vary as a function of SES (Kaiser 2010). Therefore, it is possible that violent video gaming and its correlates may differ in emerging adults of lower SES or those who do not attend college. However, given that two-thirds of young people in the United States enter college the year following high school (National Center for Education Statistics 2002, Table 20-2), and that those of lower SES tend to engage in more media use than those of higher SES (Kaiser 2010), findings from the present study may be relevant for a good portion of young people in the United States. Finally, our sample lacked adequate ethnic and cultural diversity to generalize results to the population at large. As cultural variation may influence how media violence is perceived, this underrepresentation did not allow us to investigate trends in all groups.

Given the limitations listed, future directions for research in this area are numerous. First, future research should utilize longitudinal data in addressing the direction and strength of the relationships between violent video gaming and prosocial behavior over time. Experimental studies also may shed additional light on these relationships, especially in regard to the role of empathic concern and other potential mediators. Although the overall indirect effects were relatively weak, the direct associations between empathic concern and prosocial behavior were moderate to strong, suggesting a need to continue to examine the role of media (and other socialization influences) on the development of empathic concern and other potential mediators of the relationship between gaming and prosocial behavior. Future research also should address how non-violent video games and prosocial video games might be associated with empathic concern and subsequent prosocial behavior. Although little work has been done examining these types of video games, our results suggest that there may be positive effects when emerging adults engage in non-violent media. Indeed, increased study of these activities may lead to a greater understanding of possible avenues of positive development among emerging adults. Future research also should examine the target of the behavior, not only with regard to prosocial behavior,

but also aggressive behavior as well. Although the current findings suggested a stronger indirect effect on prosocial behavior toward strangers, results also suggested a direct negative link between violent gaming and prosocial behavior toward family. Although understanding the direction of effects is essential in the interpretation of this finding, it will be important for future research to continue to examine the target of the behavior to gain a more nuanced understanding of this process, especially in light of Ferguson's (2010) work on the null or positive effects of violent video gaming which focuses more on individual outcomes rather than effects on relationships.

Despite the limitations mentioned, this study highlights the associations between violent video gaming and prosocial outcomes during emerging adulthood. Our findings add to the extant research by further exploring the associations between violent video gaming and prosocial behavior, specifically by highlighting one mechanism (decreased empathic concern) through which this process might function. Emerging adulthood is a highly exploratory time, when identities are formulated and relationships are redefined (Arnett 2004). Although it seems that many emerging adults greatly enjoy playing violent video games, playing may be associated with negative consequences not only on strangers but also within close relationships. Thus, the current study adds to a growing body of research suggesting that the target of the prosocial behavior is important to consider, and highlights violent video gaming as one potential socialization influence that might impact prosocial behavior differentially as a function of the target.

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