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The Role of Perceived Peer Norms in the Relationship Between Media Violence Exposure and Adolescents' Aggression

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This study investigates the role of a social context variable, perceived peer norms, in the relationship between media violence exposure and adolescents' aggressive behavior. This was informed by a need to better understand whether, how, and for whom, media violence exposure may affect aggression. Three hypotheses were tested with peer norms as moderator, as mediator, and as both moderator and mediator in the relationship between media violence and aggression. A two-wave longitudinal survey measured media violence exposure, perceived descriptive and injunctive norms, and aggressive behavior among 943 adolescents (aged 10–14, 50.4% girls). Results provided support only for the moderated-mediation model. The indirect effect of media violence on aggression via perceived peer approval of aggression (i.e., injunctive norms) was moderated by perceived prevalence of peer aggression (i.e., descriptive norms). Specifically, media violence indirectly increased aggressive behavior for adolescents who perceived more peer aggression, but decreased aggression for adolescents who perceived less peer aggression. Implications for future research into media violence effects are discussed.

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The social environment of adolescents provides them with multiple models for aggressive behavior. Media violence is one such factor that has been investigated for its potential modeling effects on youth's aggressive behavior. Although many studies have reported main effects of media violence on teens' aggressive behavior (e.g., Slater, Henry, Swaim, & Anderson, 2003; Krahé, Busching, & Möller, 2012), several others have yielded no such effects (e.g., Fikkers, Piotrowski, Weeda, Vossen, & Valkenburg, 2013; von Salisch, Vogelgesang, Kristen, & Oppl, 2011). An important explanation for these conflicting findings might be that adolescents differ in their susceptibility to the effects of media violence. The Differential Susceptibility to Media-effects Model (DSMM, Valkenburg & Peter, 2013a) posits that the size and nature of media effects are contingent on a variety of social-context factors. Applying a differential susceptibility lens to the potential effects of media violence on adolescents' aggression can help researchers identify whether some adolescents are particularly susceptible to such effects, as well as offer insight into different underlying processes that may make adolescents more or less susceptible. This study focuses on a vital social-context variable in adolescence—perceived peer norms—and investigates its role in the media violence–aggression relationship.

Peers provide an important source of social information during adolescence, a time in which peer influence increases while parental influence declines (Berndt, 1979). Peer behavior can influence adolescents' aggressive behavior through peer norms, defined as adolescents' perceptions about the frequency and approval of aggression in the peer group (Brechwald & Prinstein, 2011). Two types of peer norms have been distinguished in the literature: descriptive and injunctive peer norms. Descriptive norms are beliefs about the *prevalence* of a behavior (e.g., "how often are your friends aggressive?"), while injunctive norms pertain to the perceived approval of a behavior (e.g., "How OK do your friends think aggression is?"; Cialdini, Reno, & Kallgren, 1990). A large body of research has shown that perceptions about peer aggression indeed affect adolescents' own aggression (e.g., Benson & Buehler, 2012; Espelage, Holt, & Henkel, 2003; Henry et al., 2000).

Given that media effects do not take place in a social vacuum, it is important to consider the influence of adolescents' social environment in media violence research (Bronfenbrenner, 1999; Jordan, 2004). Currently, there is no empirical research that has jointly investigated peer norms and media violence exposure. Yet, several media-effects theories suggest that perceived peer norms play a role in the relationship between media violence and aggression, although not in a conceptually consistent way. While some theories would conceptualize perceptions of the social context (such as peer norms) as moderators, other theories see them as mediators (Valkenburg & Peter, 2013a). In order to improve our understanding of whether, for whom, and how media violence affects aggression, it is critical that this conceptual incoherence be addressed. To that end, this study conceptualized

three hypotheses in which peer norms are treated as moderator, mediator, and as both a moderator and mediator in the relationship between media violence and aggression. To test these hypotheses, we conducted a two-wave longitudinal survey among Dutch adolescents aged 10–14. In doing so, we hope to provide more conceptual clarity on how adolescents' perceived social environment may change or explain the relationship between media violence and aggression.

PEER NORMS AS MODERATOR OF MEDIA VIOLENCE EFFECTS ON AGGRESSION

The first way in which peer norms may play a role in the relationship between media violence and aggression is by affecting for whom such a relationship is present or more pronounced. This notion that not all media users are equally affected by media and that social-context factors can moderate the relationship between media violence exposure and aggressive behavior has been put forward in several theoretical models (e.g., social cognitive theory [Bandura, 2001], cultivation theory [Gerbner, Gross, Morgan, & Signorielli, 1980], reinforcing spirals model [Slater, 2014], differential susceptibility to media-effects model [Valkenburg & Peter, 2013a]). In these theories, the concepts of "resonance" (Gerbner et al., 1980) and "context–content convergence" (Valkenburg & Peter, 2013a) predict that stronger media effects may occur among those media users for whom media messages are congruent with their real life. For example, for those adolescents who perceive more peer aggression in their environment, media violence may find more ground, thereby resulting in a stronger effect on aggression. On the other hand, for adolescents who do not perceive their peers to be aggressive, the potential impact of media violence on aggression may be reduced or even be absent (cf. Slater, 2007).

Although an interaction between media violence exposure and peer norms has not yet been investigated, several longitudinal studies provide evidence for the argument that adolescents' social experiences can change the media violence–aggression relationship. For example, Slater, Henry, Swaim, and Cardador (2004) showed that adolescents who were exposed to higher levels of both violent media content and peer victimization showed more aggressive behavior. Yang and Bushman (2014) similarly reported that a combination of higher violent media consumption and peer rejection was related to increased behavioral problems. Outside the peer context, Fikkers et al. (2013) found that media violence predicted increased aggressive behavior for adolescents who were growing up in high conflict families, but not for adolescents in low conflict families.

Given the evidence from related research and the theoretical argumentation for differential media violence effects on aggression as a consequence of

peer norms, it is reasonable to investigate whether adolescents who observe aggression in the media *and* perceive aggression as normative among their peers will show a larger increase in aggressive behavior compared to peers who perceive little or no peer aggression. Similarly, for adolescents who perceive little or no peer aggression in their environment, media violence and aggression may be less strongly related, or even not at all. Knowledge about such a moderating effect of peer norms helps identify which adolescents are most vulnerable to media violence effects. To that end, we test the following hypothesis:

H1: The relationship between media violence exposure and increased aggression is stronger for adolescents who perceive more peer aggression (descriptive norms; Hypothesis 1a), or who perceive more peer approval of aggression (injunctive norms; Hypothesis 1b).

Peer Norms as Mediator Between Media Violence and Aggression

A second way in which peer norms may play a role in a media violence–aggression relationship is by acting as a mediator between those variables. Although many media violence studies have tended to focus on direct effects, most media-effects theories acknowledge that media exposure affects behavior indirectly, for example via affecting social cognitions, rather than directly (e.g., Anderson & Bushman, 2002; Bandura, 2001). Social cognitions are "the mental processes involved in perceiving, attending to, remembering, thinking about, and making sense of the people in our social world" (Moskowitz, 2005, p. 3). Perceived peer norms are a type of social cognition (Huesmann, 1998) that may form one of the possible paths from media violence to aggressive behavior.

Social information processing theories provide the underpinnings for how media violence may first increase perceptions of peer aggression (i.e., descriptive norms) and peer approval of aggression (i.e., injunctive norms), and how these increased peer norms may subsequently increase aggressive behavior. Media violence exposure is believed to increase the accessibility of aggression-related information in memory. This more accessible information subsequently has more weight when people make judgments about the prevalence and approval of aggression (Riddle, 2010; Shrum, 1995). As a result, high violent media consumers may be more likely to report higher estimates of perceived prevalence and approval of aggressive behavior in their social environment compared to low violent media consumers. Following this, these higher perceived peer norms may influence the cognitive processes leading up to actual aggressive behavior (Huesmann, 1998). Several cognitive steps are believed to take place before someone acts aggressively, from accessing and retrieving scripts for aggression to evaluating whether or not to act aggressively (Crick & Dodge, 1994; Huesmann, 1998). Within the

evaluation step of that process, beliefs about other people's aggression and approval of aggression (i.e., descriptive and injunctive norms) are used to assess the outcome desirability of behaving aggressively (Huesmann, 1998). Adolescents who perceive their peers as more accepting of and engaging in aggression may be more likely to evaluate aggressive behavior as desirable outcome, thereby increasing the likelihood of actual aggression.

Although there is no existing research on how peer norms may mediate the influence of media violence on aggression, studies in related fields indicate that such a mediation relationship could be expected. For example, Huesmann and Guerra (1997) investigated adolescents' normative beliefs as antecedents of aggressive behavior. Normative beliefs reflect adolescents' own acceptance of aggression, whereas descriptive and injunctive norms reflect their perceptions of the degree to which their peers are aggressive or approve of aggression. Research has shown that adolescents' normative beliefs can be affected by media violence exposure (Krahé & Möller, 2004; Linder & Werner, 2012), that normative beliefs are positively related to children's aggressive behavior (Huesmann & Guerra, 1997), and that they serve as a mediator between media violence and aggression (Gentile, Li, Khoo, Prot, & Anderson, 2014). Research on other media effects also suggests that peer norms are a potential route from media exposure to aggressive behavior. For example, a study by Bleakley, Hennessy, Fishbein, and Jordan (2011) showed that sexual media exposure increased adolescents' beliefs that sexual behavior was more common among their peers, which in turn was related to increased sexual behavior.

In all, there is a sound theoretical basis to expect that media violence may increase perceptions of peer aggression and peer approval of aggression, which may subsequently increase adolescents' aggressive behavior. This relationship is also tentatively supported by empirical evidence from related fields. Knowledge about such a mediating effect of peer norms helps identify how media violence may be related to increased aggressive behavior. To that end, we test the following hypothesis:

H2: Media violence exposure is related to an increase in aggressive behavior via an increase in the perceived prevalence of peer aggression (descriptive norms; Hypothesis 2a), and via an increase in the perceived peer approval of aggression (injunctive norms; Hypothesis 2b).

Exploring a Dual Role for Peer Norms: Moderator and Mediator

Most media-effects theories acknowledge that media use and the social environment are related to each other and to behavior in complex ways. Accordingly, conceptualizing the role of peer norms as either moderator or mediator in the link between media violence and aggression may not fully

capture this complex relationship. Given that both moderation and mediation can be theoretically argued for, it is equally possible that peer norms may simultaneously moderate and mediate the effect of media violence on aggressive behavior.

Analytically, it is very complex to treat the same variable as moderator and mediator. However, given that peer norms consist of two types (descriptive and injunctive norms), we can conceptualize a model in which one of the two types of norms is treated as moderator, and the other as mediator. In our view, injunctive norms (i.e., perceived peer approval of aggression) would be a more plausible mediator than descriptive norms (i.e., the perceived prevalence of aggression). Although descriptive and injunctive norms are often treated similarly in the literature, they differ in the extent to which they can be based on real-life observations. Festinger's (1954) work on social comparison processes suggests that in the absence of objective bases for comparison, beliefs are likely to be unstable. Based on this line of reasoning, injunctive norms are expected to be less stable than descriptive norms because peer approval of aggression cannot be directly observed whereas the prevalence of peer aggression can. Importantly, this may make adolescents' injunctive norms more susceptible to influences from other sources of information, such as the media and, thus, more likely to mediate a relationship between media violence and aggression.

Similarly, we would argue that of the two types of peer norms, descriptive norms seem the more likely moderator. Cultivation Theory (Gerbner et al., 1980, p. 15) proposes that when an issue is particularly salient in the environment of a media user, media messages that are congruent with that issue may have stronger effects. Of the two types of norms, descriptive norms are arguably more salient than injunctive norms. Whereas injunctive norms represent a more implicit message about peers' approval of aggression, descriptive norms represent a more overt message about peers' frequency of aggressive behavior. The more overt nature of descriptive norms makes them a more salient form of norms when compared to injunctive norms. Thus, it is theoretically more logical for descriptive norms to act as moderator than for injunctive norms.

Based on this line of reasoning, we hypothesize a moderated-mediation model with descriptive norms as moderator and injunctive norms as mediator. More specifically, we expect that for adolescents who perceive more peer aggression (i.e., higher descriptive norms), media violence will resonate more strongly and lead to an increase in their perception of peers' approval of aggression (i.e., injunctive norms). Subsequently, this increased perception of peer approval of aggression is expected to increase aggression. In other words, we expect a stronger mediation relationship between media violence exposure, increased injunctive norms, and increased aggression for those adolescents with higher descriptive norms. Conversely, for adolescents with low descriptive norms (indicating little or no perceived peer aggression),

this mediation relationship may be weaker or absent. Investigating such a moderated-mediation process helps identify not only which adolescents are most vulnerable to media violence effects, but also how media violence leads to increased aggression for a potentially vulnerable subset of adolescents. To that end, we test the following hypothesis:

H3: The indirect effect of media violence on increased aggression through increased injunctive norms is stronger for adolescents with higher levels of descriptive norms.

METHOD

Participants and Procedure

After receiving approval from the sponsoring institution's institutional review board, a large, private survey research institute in the Netherlands (TNS NIPO/Veldkamp) collected the data. Families were recruited through TNS NIPO's existing online panel of approximately 60,000 households that is representative of the Netherlands. All households with at least two children between the ages of 10 and 14 years (1,565 families in the panel) were invited to participate, of which 516 families participated. Data collection consisted of two waves, and took place in the adolescents' homes where they filled out a questionnaire on a laptop. The first wave of data collection was conducted between September and December 2012; the second wave was conducted between September and December 2013. Data collection procedures were identical for both waves.

A total of 1,032 adolescents participated in WAVE 1, and 1,011 adolescents participated again in WAVE 2 (a dropout of 2.03%). The final sample consisted of the 943 adolescents who had complete data on all study variables. Missing data was random (i.e., not associated with household characteristics, media violence exposure, or aggression). This final sample consisted of 99.7% sibling pairs; 50.4% were girls; and the sample's mean age at WAVE 1 was 11.8 years ($SD = 1.4$ years).

Measures

Media violence exposure. Media violence exposure was measured using direct estimates of exposure to television and game violence. This method has been found reliable and valid for use in adolescent samples (Fikkers, Piotrowski, & Valkenburg, 2015). Direct estimates measured exposure to violent content on television and in electronic games with two items each (four items in total): 1) How often do you watch television programs (play games) that contain violence? and 2) On the days that you watch television

programs (play games) that contain violence, how much time do you spend on this per day? Participants were given the following definition of violence: "All violence (for example, fighting and shooting) that living beings (for example, humans and monsters) do to each other." Games referred to all types of games (video games, but also casual games played on mobile phones or websites). Response categories for the first item ranged from 0 (*never*) to 7 (*7 days per week*). The second item was an open-ended question, answered by filling in hours and minutes. The two items for each medium were multiplied to calculate the number of hours per week of violent television and violent game exposure. These two variables were then summed to create one variable representing violent media exposure in hours per week. Adolescents in our sample reported an average of 5.29 hours per week ($SD = 10.93$) of media violence exposure at WAVE 1.

Descriptive norms. No existing scale was available for descriptive and injunctive norms about aggressive behavior. We therefore followed the procedure of studies investigating peer norms related to other behaviors in adolescent samples (e.g., Baumgartner, Valkenburg, & Peter, 2011; Elek, Miller-Day, & Hecht, 2006). Descriptive norms were measured with two items, asking adolescents to indicate how many of their friends showed the following two behaviors in the past 6 months: (1) swear at another adolescent; (2) kick or hit another adolescent. Participants were told that "friends" meant friends they see more than once a week, with whom they spent time, and who they liked doing things with. Response options were (1) *none of my friends*; (2) *less than half of my friends*; (3) *about half of my* friends; (4) *more than half of my friends*; and (5) *almost all my friends*. The two items were averaged to create a scale (Cronbach's $\alpha = .71$). Means and standard deviations for WAVE 1 and WAVE 2 are reported in Table 1.

Injunctive norms. The measure for injunctive norms used the same items as for descriptive norms, but with a different question stem. Adolescents were asked what their friends think about (1) swearing at another adolescent, and (2) kicking or hitting another adolescent. Response options were (1) *completely not OK*; (2) *not OK*; (3) *somewhat not OK, somewhat OK*; (4) *OK*; (5) *completely OK*. The two items were averaged to create a scale (Cronbach's $\alpha = .81$). Means and standard deviations for WAVE 1 and WAVE 2 are reported in Table 1.

Aggressive behavior. Adolescents' direct aggression was measured using eight items from the Direct and Indirect Aggression Scale (DIAS; Björkqvist, Lagerspetz, & Kaukiainen, 1992). Adolescents were asked how often they do the following things when they are angry with another adolescent: (1) hit; (2) yell at or argue with; (3) kick; (4) swear at; (5) trip; (6) threaten to hurt; (7) push; or (8) fight with another adolescent. Response options were (1) *never*; (2) *almost never*; (3) *sometimes*; (4) *often*; and (5) *very often*. These items formed a reliable scale (at both waves, Cronbach's $\alpha = .92$). Means and standard deviations for WAVE 1 and WAVE 2 are reported in Table 1.

TABLE 1 Means, Standard Deviations, and Zero-Order Correlations for All Study Variables

Variable	Mean (*SD*)	Zero-order correlations[a]									
		1	2	3	4	5	6	7	8	9	10
1. Media violence exposure T1[b]	4.60 (6.87)	—									
2. Descriptive norms T1	1.62 (0.75)	.25*	—								
3. Injunctive norms T1	1.75 (0.75)	.28*	.57*	—							
4. Aggression T1	1.61 (0.69)	.36*	.43*	.45*	—						
5. Descriptive norms T2	1.73 (0.84)	.26*	.41*	.36*	.36*	—					
6. Injunctive norms T2	1.85 (0.84)	.28*	.37*	.43*	.40*	.63*	—				
7. Aggression T2	1.62 (0.70)	.33*	.31*	.34*	.59*	.43*	.47*	—			
8. Change in descriptive norms	0.11 (0.86)	.02	−.40*	−.15*	−.02	.56*	.29*	.15*	—		
9. Change in injunctive norms	0.09 (0.84)	.03	−.15*	−.43*	−.01	.30*	.55*	.16*	.45*	—	
10. Change in aggression (latent)	0.01 (0.61)	.00	−.14*	−.13*	−.40*	.07*	.08*	.45*	.20*	.21*	—
11. Gender (girls = 0; boys = 1)	—	.39*	.21*	.21*	.34*	.24*	.24*	.32*	.04	.06	.01

Note. T2 variables were not used in the structural equation models.

[a]Pearson's *r* correlations, which were converted from Kendall's tau-a correlations (which take into account non-normality and clustering) using Greiner's relation in Stata 12 (Newson, 2002).

[b]Trimmed version of media violence exposure, as used in the analyses. Mean (*SD*) of the original variable is reported in the Methods section.

*$p < .05$.

Gender (control variable). We included gender as a control variable in all analyses (girls = 0; boys = 1).

Analytic Approach

Structural equation modeling (SEM) in MPlus (version 7.11; L. K. Muthén & Muthén, 2014) was used to test all study hypotheses. In determining the appropriate manner in which to conduct these SEM models, four characteristics of the data were considered: 1) distributions of independent and dependent variables; 2) the longitudinal nature of the dataset and hypotheses; 3) the operationalization of the moderator and mediator roles of peer norms; and 4) the clustered nature of our sample due to the inclusion of siblings pairs.

Regarding variable distribution, media violence exposure and aggressive behavior were both positively skewed in our sample, with many adolescents reporting no aggression and no media violence exposure. As a result, traditional parametric analyses would increase the likelihood of making Type I errors (Atkins & Gallop, 2007). Although bootstrapping methods have been used as solution for analyses using non-normal variables, these do not fully solve problems with highly skewed variables such as aggressive behavior (B. Muthén, 2011), while Poisson regression models are difficult to interpret in the context of longitudinal moderated-mediation analysis (VanderWeele & Vansteelandt, 2009). Our solution to address the data skewness was to create a change score for aggressive behavior between Wave 1 and Wave 2. Specifically, change scores for the eight individual aggression items were calculated by subtracting the Wave 1 score from the Wave 2 score. These eight change scores were then used as items in a factor analysis yielding a unidimensional factor structure with standardized factor loadings ranging from .51 to .74. Running the models with the original aggression variables instead of the change scores did not change the pattern of results.

Using this latent score for change in aggression had three consequences for our analyses. First, change in aggression was normally distributed, meaning we could proceed with parametric SEM analyses. Second, using a change variable as the dependent variable is statistically equivalent to using aggression at Wave 2 as the dependent variable while controlling for aggression at Wave 1. Therefore, by using the change score for aggression, our models took into account the longitudinal nature of our data. Third, the change score reduces the need for control variables. After all, control variables would have to explain change in aggression rather than level of aggression. We checked whether several common control variables, such as gender and socioeconomic variables (e.g., income, educational level), correlated with change in aggression, but none did. For gender, we found a significant correlation with media violence exposure (see Table 1). Since this relationship may introduce bias (Wildt & Ahtola, 1978), and because it is the most common

control variable in media violence research, we opted to include gender as control variable to provide a more conservative test of our hypotheses.

To account for the non-normal distribution of media violence exposure, we treated this variable as a count variable in the analyses. Count variables are variables that only have non-negative integer values. Because count variables can only have a limited number of values, we trimmed media violence exposure at 28 hours per week. Trimming meant that the values of 29 participants (3.1% of the sample) with media violence exposure of more than 28 hours were trimmed to the value of 28. Running the models with the original (untrimmed) variable, or with media violence exposure trimmed at different levels (e.g., at 20, 35, or 40) did not change the results. Mplus does not provide fit statistics or standardized coefficients in analyses using count variables. Therefore, all analyses were conducted twice: once with media violence treated as regular continuous variable, and once with media violence treated as count variable. We report the fit statistics and standardized coefficients based on the former analyses, and unstandardized coefficients based on the latter analyses. Although these analyses treat the media violence exposure variable differently, we found minimal differences between the results.

Regarding the operationalization of the moderator and mediator variables, we operationalized descriptive and injunctive norms in two different ways depending upon the hypothesis. The moderation hypothesis (Hypothesis 1) expects that higher media violence exposure and higher peer norms at Wave 1 interactively predict an increase in aggression. Therefore, when norms were investigated as a moderator in tests of Hypotheses 1 and 3, the Wave 1 variable was used. At the same time, our mediation hypothesis (Hypothesis 2) predicts that media violence leads to a change in peer norms which subsequently predicts change in aggression. Therefore, when peer norms are used as a mediator in tests of Hypotheses 2 and 3, they are included as a change score. Change scores for both descriptive and injunctive peer norms were calculated by subtracting the Wave 1 score from the Wave 2 score. Means and standard deviations for these change scores are reported in Table 1.

Last, as noted in the participants section, 99.7% of our sample consisted of sibling pairs. Such clustering can result in over- or underestimation of coefficients due to biased estimates of standard errors (Desai & Begg, 2008). We accounted for this clustering by using the cluster option in Mplus to obtain corrected standard errors (Asparouhov & Muthén, 2006).

For all hypothesized models, we evaluated model fit by using the comparative fit index (CFI) and the root mean square error of approximation (RMSEA). We preferred these measures over the Chi-square statistic, given that this index is often unreliable with large samples. A good model fit is indicated by a CFI larger than 0.95 and an RMSEA smaller than .05. A CFI between 0.90 and .095 and an RMSEA between .05 and .08 indicate

acceptable model fit (Kline, 2010). All models included gender as control variable (girls = 0; boys = 1).

RESULTS

Descriptive Results and Correlations

Table 1 presents the means, standard deviations, and correlations for all study variables. Adolescents in our sample reported on average 4.6 hours per week of media violence exposure (after trimming the variable; SD = 6.87). In general, adolescents perceived relatively low frequencies of peer aggression (descriptive norms: M = 1.62, SD = 0.75) and peer approval of aggression (injunctive norms: M = 1.75, SD = 0.75; both on a scale from 1 to 5). Aggressive behavior was also relatively infrequent in our sample, with a reported mean of 1.61 (SD = 0.69) on a scale from 1 to 5. Test–retest correlations between Wave 1 and Wave 2 indicate that descriptive norms (r = .41), injunctive norms (r = .43), and aggressive behavior (r = .59) were stable over time.

Media violence exposure correlated positively with aggressive behavior both cross-sectionally (r = .36, p < .001) and longitudinally (r = .33, p < .001). In addition, media violence exposure was positively related to both descriptive and injunctive norms cross-sectionally (descriptive: r = .25, p < .001; injunctive: r = .28, p < .001) as well as longitudinally (descriptive: r = .26, p < .001; injunctive: r = .28, p < .001). In turn, descriptive norms correlated significantly with aggressive behavior (cross-sectional r = .43, p < .001; longitudinal r = .31, p < .001), as did injunctive norms (cross-sectional r = .45, p < .001; longitudinal r = .34, p < .001).

Peer Norms as Moderator

Hypothesis 1 predicted that media violence exposure would lead to an increase in aggressive behavior for those adolescents with higher descriptive peer norms (Hypothesis 1a) or higher injunctive peer norms (Hypothesis 1b). We tested separate models for each moderator. In each model, an interaction term between media violence and the moderator was included. Our hypothesized models had acceptable fit to the data, CFI = .96, RMSEA = .05 (90% confidence interval (CI) = .041–.059) for descriptive norms as moderator; and CFI = .97, RMSEA = .047 (90% CI = .038–.055) for injunctive norms as moderator. Results did not support Hypotheses 1a or 1b. Neither descriptive norms (b = .10, SE = .08, p = .204, b^* = .14)[1] nor injunctive norms (b = .01, SE = .09, p = .958, b^* = .01) significantly moderated the relationship between media violence and change in aggression. In addition, there was no significant overall relationship between media violence exposure and change

in aggression (main effect with descriptive norms in model: $b = -.01$, $SE = .01$, $p = .192$, $b^* = -.12$; with injunctive norms in model: $b = -.00$, $SE = .01$, $p = .918$, $b^* = -.01$).

Peer Norms as Mediator

Hypothesis 2 predicted that media violence exposure would lead to an increase in aggressive behavior via an increase in descriptive peer norms (Hypothesis 2a) and via an increase in injunctive peer norms (Hypothesis 2b). Our hypothesized model had a good fit to the data, CFI = .95, RMSEA = .048 [90% CI = .040–.057]. Neither Hypotheses 2a nor 2b was supported by the results. Media violence exposure did not induce a change in descriptive norms ($b = .01$, $SE = .01$, $p = .304$, $b^* = .05$) nor a change in injunctive norms ($b = .01$, $SE = .01$, $p = .324$, $b^* = .04$). As a result, the indirect effect of media violence on change in aggression via the mediators was not significant (indirect effect through descriptive norms: $b = .00$, $SE = .00$, $p = .318$, $b^* = .01$; indirect effect through injunctive norms: $b = .00$, $SE = .00$, $p = .325$, $b^* = .01$).[2] Both mediators did show a significant relationship with the dependent variable: Change in aggression was predicted by change in descriptive norms ($b = .11$, $SE = .03$, $p < .001$, $b^* = .17$) as well as by change in injunctive norms ($b = .10$, $SE = .03$, $p = .001$, $b^* = .15$).

Peer Norms as Both Moderator and Mediator

Hypothesis 3 predicted that the indirect effect of media violence on increased aggression through increased injunctive norms would be stronger for adolescents with higher levels of descriptive norms. The model for this hypothesis consisted of media violence exposure at Wave 1 as independent variable, descriptive norms at Wave 1 as continuous moderator, change in injunctive norms as mediator, change in aggression as latent dependent variable, and gender as control variable. Our hypothesized model had acceptable fit to the data, CFI = .95, RMSEA = .052 (90% CI = .042–.061).

Results showed a moderated-mediation effect, supporting Hypothesis 3. Recall that tests of Hypothesis 2 indicated that the indirect (mediation) effect, on average, was nonsignificant, which was due to a nonsignificant relationship between media violence exposure and both mediators. Tests of Hypothesis 3 indicate that media violence *is* related to change in injunctive norms, but that this relationship is moderated by descriptive norms (see Figure 1). For example, at a value of one standard deviation above the mean for descriptive norms (indicating more perceived peer aggression) media violence leads to an increase in injunctive norms, whereas at a value of one standard deviation below the mean of descriptive norms (indicating less perceived peer aggression) media violence predicted a decrease in injunctive norms. As a result, for higher levels of descriptive norms, there is a positive

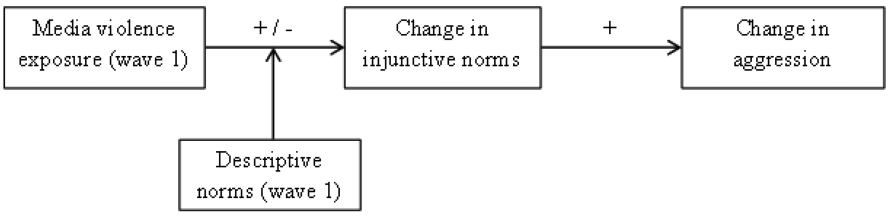

FIGURE 1 Model for the moderated-mediation hypothesis (Hypothesis 3). Gender was included as a control variable (not depicted). The relationship between media violence exposure and change in injunctive norms was positive at high values and negative at low values of descriptive norms.

standardized indirect effect ($b^* = .16$), whereas for lower levels of descriptive norms, there is a negative standardized indirect effect ($b^* = -.16$) of media violence exposure on change in aggression.

Figure 2 visualizes the size of this moderated indirect effect. The *y*-axis represents the standardized indirect effect of media violence on change in aggression via change in injunctive norms. The *x*-axis represents standardized values of the moderator (descriptive norms), with negative values indicating the number of standard deviations below the mean, and positive values indicating the number of standard deviations above the mean. The plotted diagonal line shows that for adolescents who perceive more peer aggression than average (the right-hand side of Figure 2), media violence increases aggressive behavior via an increase in perceived peer approval of aggression (i.e., injunctive norms). On the other hand, for adolescents who perceive less peer aggression than average (the left-hand side of Figure 2), media violence decreased aggressive behavior via a decrease in perceived peer approval of aggression.

DISCUSSION

The aim of this study was to examine the role of a social-context variable, perceived peer norms, in the relationship between media violence and aggressive behavior. This was informed by a need to better understand whether, how, and for whom media violence exposure may affect aggression. We conceptualized and tested three ways in which perceived peer norms about aggressive behavior (descriptive and injunctive norms) may play a role in the relationship between media violence exposure and adolescents' aggression. We did not find support for the sole moderation (Hypothesis 1) or sole mediation (Hypothesis 2) hypothesis. We did, however, find support for our moderated-mediation hypothesis (Hypothesis 3), which posited that media violence would be related to increased aggression via increased injunctive norms (i.e., higher perceived peer approval of aggression), and that

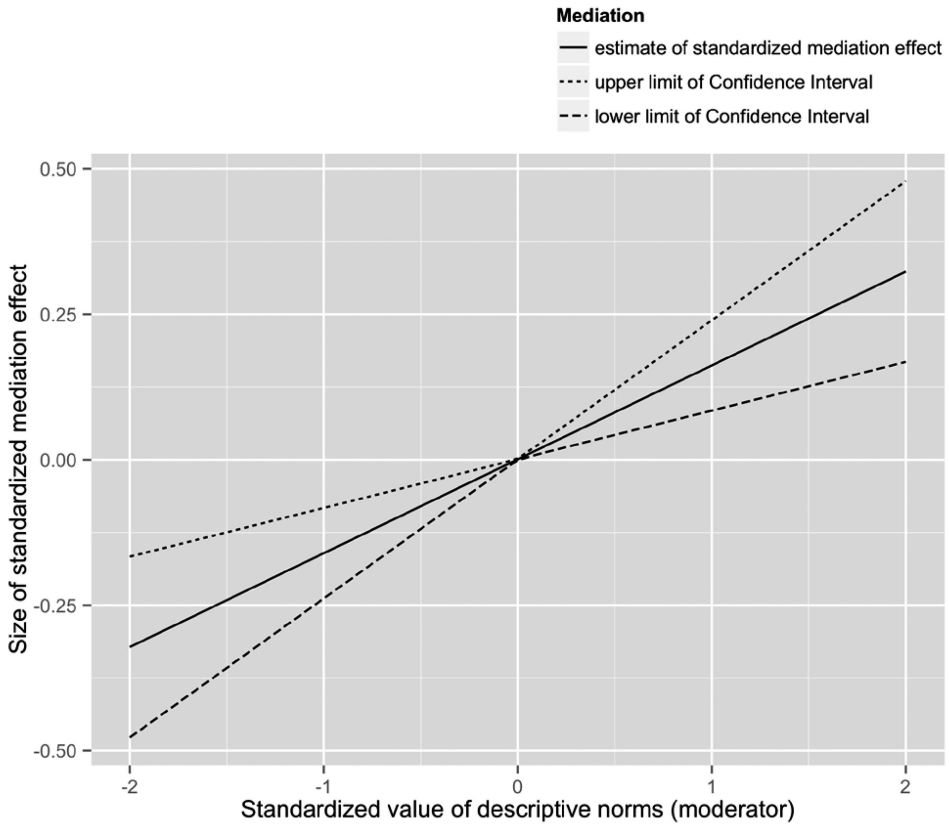

FIGURE 2 The moderated mediation effect of media violence on change in aggression via change in injunctive norms. The *y*-axis represents the standardized indirect effect of media violence on aggression; the *x*-axis represents standardized values of the moderator (descriptive norms).

this indirect effect would be stronger for adolescents with higher levels of descriptive norms (i.e., higher perceived prevalence of peer aggression).

Moderation Findings

Grounded in Cultivation Theory (Gerbner et al., 1980), Hypothesis 1 posited that the relationship between media violence exposure and increased aggression would be stronger for adolescents with higher descriptive or injunctive norms. While this omnibus prediction was not supported, the results of the moderated-mediation analysis (Hypothesis 3) did indicate that media violence and descriptive norms have an interactive influence on the mediator, change in injunctive norms. Given that Cultivation Theory focuses more on media influence on real-world perceptions than on actual behavior (cf. Romer & Jamieson, 2014), it is perhaps not strange that we found that

perceptions of peer approval of aggression were affected by this interaction rather than aggressive behavior directly. That said, the absence of an interaction effect on aggressive behavior does diverge from previous longitudinal research (e.g., Fikkers et al., 2013; Slater et al., 2004; Yang & Bushman, 2014). Differences in time lag (one year versus 4 or 6 months) or in the peer variable (perceived peer aggression versus peer rejection) may underlie the absent interaction effect on aggression. Additionally, longitudinal effects of media violence on aggression are perhaps less easily detected compared to effects on intermediary cognitive variables, especially when aggression is quite stable (Adachi & Willoughby, 2014). Longitudinal research is arguably most suitable for studying the role of social context factors in media effects, because of the higher ecological validity and the opportunity to move beyond cross-sectional correlations. At the same time, the usual limitations associated with survey research (e.g., reliance on single respondents, self-report and recall) also apply to our study. Therefore, it would be relevant to see whether these findings replicate in an experimental setting, which, due to its higher internal validity, may be better suited to detect small and subtle effects of media violence exposure.

Despite the absence of a longitudinal interaction effect on aggression, our finding that injunctive norms were affected by a combination of media violence and descriptive norms indicates that the route from media violence to aggression differs for youth growing up in different contexts. Although previous researchers have identified and studied several potential mediating variables in the media violence–aggression relationship (for a review, see Krahé, 2014), little research has examined how the role of these mediators may be dependent on different environments. For example, it is unclear whether media violence exposure increases hostile attribution bias or decreases empathy more for adolescents who perceive more peer aggression compared to adolescents who do not perceive peer aggression. In addition, it is unclear what happens for different adolescents during media violence exposure: Do adolescents who also perceive aggression in real-life have more attention for media violence, do they like it more, and do they experience more arousal during the consumption of violent media compared to adolescents not growing up in an aggressive environment? Investigating such questions can go a long way toward identifying not only for whom and how media violence may influence aggression, but also toward identifying ways to minimize potential negative effects.

Mediation Findings

In addition to expecting evidence of moderation, theory also pointed to the potential mediating role of peer norms in the relationship between media violence and aggression (e.g., Anderson & Bushman, 2002; Bandura, 2001). As with our moderation hypothesis, our omnibus mediation hypothesis was

not supported. When looking at the mediation effect across our full sample, perceived peer norms did not mediate the effect of media violence on aggressive behavior (Hypothesis 2). However, the moderated-mediation analysis (Hypothesis 3) indicated that the mediation was in fact not absent, but instead differed for different subgroups (see Figure 1). Specifically, for adolescents who perceived greater peer aggression in their environment (i.e., descriptive norms), exposure to media violence was related to an increase in perceived peer approval of aggression (i.e., injunctive norms). On the other hand, for adolescents who perceived less peer aggression in their environment, media violence exposure was related to a decrease in perceived peer approval of aggression. As a consequence, media violence indirectly led to more aggression for adolescents with high perceived peer aggression, but to less aggression for adolescents with low perceived peer aggression.

Initially, we only expected that the indirect relationship between media violence and aggression would be stronger for adolescents with higher descriptive norms, and weaker or absent for adolescents with lower descriptive norms. This expectation was based on several theoretical models (Gerbner et al., 1980; Valkenburg & Peter, 2013a) that predict stronger media effects when media content is congruent with the perceived social context. Our results show support for this congruency argument. Adolescents who consume violent media and perceive greater peer aggression were more likely to believe that their peers approve of aggression, which was related to an increase in aggressive behavior. The convergence of messages received from the media and peers resulted in a boosted indirect effect on adolescents' aggressive behavior.

Somewhat unexpectedly, for adolescents with lower descriptive norms, the mediation relationship was not weaker or absent, but rather in the reverse direction. For adolescents who perceived little to no peer aggression in their environment, media violence decreased their belief that peers would approve of aggression, which subsequently resulted in less aggressive behavior. Typically, real-life socialization agents in adolescents' lives, such as parents, school, and the community, encourage adolescents to be prosocial rather than aggressive, whereas media violence presents adolescents with a different view (Arnett, 1995). Given that interpersonal sources generally carry more weight than media content (Chaffee, 1986), it seems that adolescents may solve such an incongruence between media content and peer behavior by discounting the messages in the media. Watching aggression in the media while perceiving no real-life aggression among their peers may strengthen adolescents' beliefs that "my friends wouldn't like that" and, as a result, they are less motivated to engage in aggressive behavior. Future research on how youth integrate violent media messages that run counter to the arguably strong socialization messages from parents and schools could potentially identify ways to reduce the effect of media violence on increased aggression.

Implications

In all, our findings provide two important implications for future research and theory about media violence effects. First, our findings provide further support for the idea that (perceptions of the) social context can make some adolescents more susceptible to media effects. Importantly, we found that adolescents' social environment may not only strengthen, but also reverse effects of media violence on aggression. This finding does not neatly fit into most of the traditional media violence theories that focus on explaining how media violence may increase aggression (e.g., the general aggression model [Anderson & Bushman, 2002]; social cognitive theory [Bandura, 2001]). More recent differential susceptibility perspectives (e.g., Slater, 2014; Valkenburg & Peter, 2013a), however, allow for the possibility that the strength of the relationship between media violence and aggression can be changed by one's social context. The findings of this study can be seen as extending these perspectives by showing that social context can also affect the direction of the relationship. Recently, Piotrowski and Valkenburg (in press) have called for research that not only investigates how negative outcomes of media use may be increased by negative individual difference factors, but also how they may be decreased by positive factors. Our study is the first to show that media violence may indirectly decrease aggression in a positive social context (i.e., in absence of perceived peer aggression). Future research should replicate these findings, as well as explore how other positive social context factors (e.g., parental media mediation) may mitigate or reverse the negative effects of media violence on aggression.

Second, our findings illustrate that moderated-mediation was a more accurate conceptualization of the complex relationship between media violence, social context, and aggression, whereas the more simplistic moderation and mediation models resulted in a suboptimal conceptualization of media effects (cf. Valkenburg & Peter, 2013a). Indeed, only through moderated-mediation did we discover that mediation did take place, but in different directions for different adolescents. Similarly, only through moderated mediation did we learn that moderation did take place, but that this affected the mediator rather than the dependent variable aggression. In fact, the contribution of media violence to adolescents' aggression in our sample was modest at best, and more pronounced in its influence on the cognitive mediator (among a subset of teens) than on aggression itself. This study, therefore, supports the argument that media-effects research should simultaneously investigate moderation and mediation in order to fully understand whether, how, and for whom, media violence affects aggressive behavior. Such research would answer both the call for a more nuanced view on media violence effects as well as the need for research that better maps onto media-effects theories, few of which posit universal and direct effects (Valkenburg & Peter, 2013b).

Conclusion

Although media violence effects are heavily debated, most researchers seem to agree that if media violence has an effect, it is not universal nor is it likely to affect aggression directly. Yet, despite this agreement, most empirical research still reflects such a universal-and-direct-effects perspective (Valkenburg & Peter, 2013a, 2013b). This study moved beyond this traditional perspective and explored whether and how a social context variable, perceived peer norms, may influence the media violence–aggression relationship. Results of this study show that perceived peer norms both moderate and mediate the relationship between media violence and aggression. Specifically, media violence increased beliefs of peer approval of aggression for adolescents who perceived greater peer aggression, which subsequently resulted in increased aggression. Conversely, for adolescents who perceived little to no peer aggression, media violence exposure decreased such beliefs and subsequent aggression. These findings point to the important role of social perceptions in the media violence–aggression relationship. Moving forward, it is crucial that media violence researchers pay more attention to what happens when media violence converges or conflicts with an adolescent's social environment, and how this may subsequently increase or decrease adolescents' aggression. Moreover, our findings suggest that it is vital to ask for whom and how media violence may increase aggression, rather than assuming that this process is similar for all media violence consumers (cf. Gunter, 2008; Valkenburg & Peter, 2013a).

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NOTES

1. Reported *p*-values refer to the unstandardized coefficients. For the standardized coefficients (*b**), the *p* values were (nearly) identical and, therefore, not reported.
2. Standard error should be bootstrapped for indirect effects, but this is not possible due to clustering in data and model. An unclustered bootstrap of standard errors of the indirect effect yielded the same estimates and slightly higher *p* values. All other unstandardized coefficients in the Results section are based on analyses that treat media violence exposure as count variable (as discussed in the Analytic Approach section). Indirect effects, however, cannot be estimated in count models by Mplus. Therefore, for these indirect effects both the standardized and unstandardized coefficients are based on a model that treats media violence exposure as continuous variable.

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