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DOI
10.1080/15213269.2015.1121825

Publication date
2017

Document Version
Final published version

Published in
Media Psychology

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Link to publication

Citation for published version (APA):
Vossen, H. G. M., Piotrowski, J. T., & Valkenburg, P. M. (2017). The longitudinal relationship between media violence and empathy: Was it sympathy all along? *Media Psychology*, *20*(2), 175-193. https://doi.org/10.1080/15213269.2015.1121825

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Download date:16 Oct 2026

Media Psychology, 20:175–193, 2017
ISSN: 1521-3269 print/1532-785X online
DOI: 10.1080/15213269.2015.1121825

Routledge
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The Longitudinal Relationship Between Media Violence and Empathy: Was It Sympathy All Along?

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Previous research with adolescents has reported a negative relationship between media violence and empathy. There are, however, two important conceptual issues in this earlier literature that deserve further research attention. First, studies often treat empathy as a one-dimensional construct while it consists of both an affective and cognitive component. Second, while aiming to measure empathy, several studies have measured sympathy instead. Driven by these concerns, this study was designed to investigate the longitudinal relationship between media violence, affective empathy, cognitive empathy, and sympathy. Using data from a two-wave panel study with 943 adolescents (10–14 years old), a cross-lagged model tested whether media violence exposure negatively influences empathy and sympathy (desensitization) or whether empathy and sympathy negatively influence media violence exposure (selection). Results were in line with desensitization. However,

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This research was supported by a grant to Patti M. Valkenburg from the European Research Council under the European Union's Seventh Framework Programme (FP7/2007-2013)/ERC grant agreement no [AdG09 249488-ENTCHILD].

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rather than showing that media violence leads to a decrease in empathy (which previous studies have shown), results indicate a decrease in sympathy instead. These findings provide clarification to existing work as well as offer methodological and practical implications.

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Recent American and European estimates indicate that adolescents spend more than 8 hours per day using some form of media (Engels, Petric, de Vos, & de Haan, 2014; Rideout, Foehr, & Roberts, 2010). At the same time, content analyses indicate that violent content is prolific in the entertainment media that teens use (Bleakley, Jamieson, & Romer, 2012; Potts & Belden, 2009). For example, one study showed that of the 60 most popular video games, 68% included one or more violent acts (Smith, Lachlan, & Tamborini, 2003). Of the videogames that were rated as suitable for ages six and up, 54% contained violence. These statistics are concerning given that numerous cross-sectional, experimental, and longitudinal studies have provided empirical evidence linking violent media consumption with subsequent aggressive behavior (Anderson et al., 2010; for contrary results, see Ferguson & Kilburn, 2009; Greitemeyer & Mügge, 2014; Paik & Comstock, 1994). Yet, the effects of media violence are not solely relegated to aggressive behavior. Indeed, researchers agree that media violence is also likely to influence other behavioral and social–emotional outcomes, some of which may even be the underlying mechanism between violent media and aggressive behavior (Anderson & Bushman, 2002; Carnagey, Anderson, & Bushman, 2007).

In recent years, empathy has received an increasing amount of attention by media violence researchers because it plays a crucial role in moral development (Hoffman, 2001) and is negatively related to aggression (e.g., Jolliffe & Farrington, 2006b). Thus far, several cross-sectional and longitudinal studies have shown that media violence exposure leads to lower levels of trait empathy among adolescents (e.g., Fraser, Padilla-Walker, Coyne, Nelson, & Stockdale, 2012; Krahé & Möller, 2010). However, the existing research on the influence of media violence on empathy suffers from two conceptual problems. First, studies often treat empathy as a one-dimensional construct, while it is generally considered a multidimensional construct consisting of both an affective and cognitive component. Specifically, these studies typically either measure only the affective component of empathy or instead use a composite score of cognitive and affective empathy (Hoffman, 2001; Shamay-Tsoory, Aharon-Peretz, & Perry, 2009). Second, there is an issue with measurement validity because some studies have actually measured sympathy rather than empathy. The present study aims to address these conceptual issues. Using a new measure of empathy and sympathy with a sample of adolescents, we investigate the longitudinal relationship between media violence, affective empathy, cognitive empathy, and sympathy. Studying these relationships in an adolescent sample is particularly relevant as developing stable and productive peer relations is one of the main developmental tasks in adolescence, and empathy plays a key role in forming such social relationships (Eisenberg et al., 1996).

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THE RELATIONSHIP BETWEEN MEDIA VIOLENCE, EMPATHY, AND SYMPATHY

Defined as the general predisposition to understand and experience the emotional state of someone else (Eisenberg & Fabes, 1990; Hoffman, 2001), trait empathy is important in social interaction and moral development and, as such, might serve as an underlying mechanism between media violence and behavioral outcomes such as aggression. To date, there are several cross-sectional studies that have demonstrated that media violence is negatively associated with empathy (Anderson et al., 2010; Bartholow, Sestir, & Davis, 2005; Fraser et al., 2012; Funk, 2005; Funk, Baldacci, Pasold, & Baumgardner, 2004; Wei, 2007). This relationship is generally explained by one of two processes. First, as incorporated in the General Aggression Model (GAM; Anderson & Bushman, 2002), repeated exposure to media violence may result in desensitization to real-world violence (Drabman & Thomas, 1974). Desensitization can be understood as a decreased physiological, emotional, and cognitive response to real-word violence and is thought to be an adaptive process to help individuals deal with distress resulting from the confrontation of violence. In terms of empathy, repeated exposure to media violence over time will lead to reduced trait empathy (Funk, 2005). Second, through the process of selection, empathy can influence exposure to media violence, as less empathic individuals may seek out more violent media because they experience less emotional distress from it compared to their more empathic peers (Krahé & Möller, 2010). It is possible that both causal pathways are present simultaneously or even reinforce each other (Slater, 2007; Valkenburg & Peter, 2013).

In order to test the causal pathways between media violence and empathy, two studies have followed up on the earlier cross-sectional work with longitudinal research among adolescents (Krahé & Möller, 2010; Mößle, Kliem, & Rehbein, 2014). Both studies demonstrated that adolescents with high initial levels of media violence exposure had decreased levels of trait empathy after one year, providing evidence for desensitization. No support was found for a selection effect—in other words, there was no influence of empathy on the use of violent media over time. These studies provide valuable information on the causal relationship between media violence and empathy. There are, however, two conceptual issues that cloud our understanding of this relationship. First, some studies treat empathy as a unidimensional construct, while empathy is generally conceptualized as a multidimensional construct; and second, empathy is frequently equated with sympathy.

EMPATHY AS A MULTIDIMENSIONAL CONSTRUCT

While empathy is generally considered to be comprised of an affective and a cognitive component, several empirical studies investigating the relationship

between empathy and media violence conceptualize empathy as a unidimensional construct (Bartholow et al., 2005; Funk et al., 2004). Affective empathy pertains to the vicarious experience and sharing of someone else's emotions (Mehabrian & Epstein, 1972). Cognitive empathy refers to understanding someone's emotional state based on using one's own representations. This happens through effortful top-down processes (Preston & Hofelich, 2012). Although affective and cognitive empathy are strongly related to each other, they are distinct concepts. Research has shown that different brain structures are involved in affective empathy and cognitive empathy (Nummenmaa, Hirvonen, Parkkola, & Hietanen, 2008; Shamay-Tsoory et al., 2009). Moreover, affective and cognitive empathy are differential predictors of certain behaviors. For instance, researchers have demonstrated that affective empathy is negatively related to physical aggression, while cognitive empathy is not (Vossen, Piotrowski, & Valkenburg, 2015; Yeo, Ang, Loh, Fu, & Karre, 2011). This indicates that individuals with a high tendency to share the feelings of others may instantly feel the emotional distress of the victim when engaging in physical aggressive acts. As a result, to reduce or avoid discomfort, individuals with high affective empathy will inhibit aggression. However, merely understanding the emotions of others (i.e., cognitive empathy) does not necessarily lead to feelings of discomfort and therefore is not related to physical aggression. Cognitive empathy without affective empathy has been found to be the basis of narcissism, psychopathy, and Machiavellism (Wai & Tiliopoulos, 2012), as manipulation and exploitation requires understanding the emotional state of others without being affected by it.

To address the multidimensional nature of empathy, the present study aims to investigate whether media violence is differentially associated with affective and cognitive empathy. As affective empathy is the vicarious emotional response to someone else's emotional state (a form of emotional reactivity), desensitization would predict that media violence specifically decreases affective empathy. After all, taking over the emotion of a victim can be distressing and, as such, repeated exposure to media violence might lead to reduced emotional responses as a way of adapting. Therefore, we posit the following hypothesis:

H1a: Adolescents' violent media exposure has a negative longitudinal effect on affective empathy.

To our knowledge, no studies have investigated desensitization in relation to cognitive empathy. This may reflect the fact that there is a clearer rationale for a desensitization effect on affective empathy than on cognitive empathy. Specifically, while taking over the emotion of a victim may be distressful for media users (i.e., affective empathy), simply understanding the emotion of a victim may not be experienced as distressful and is thus less likely to be reduced over time as a function of desensitization. On the other hand, some

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research does indicate that desensitization leads to altered cognitions about violence (Carnagey et al., 2007; Funk et al., 2004), which might ultimately influence cognitive empathy. If exposure to media violence leads individuals to believe that violence is more mundane or less serious, this could influence how an individual understands or imagines how another person would feel when confronted with violence. As such, we would expect:

H2a: Adolescents' violent media exposure has a negative longitudinal effect on cognitive empathy.

Last, although previous longitudinal research has provided no evidence to support an influence of empathy on media violence use (i.e., selection effect), earlier research has not distinguished between affective empathy and cognitive empathy. It is possible that selection may be present for one of the components of empathy. For instance, individuals high in affective empathy might avoid violent media because of their strong emotional response to the content and the possible emotional distress resulting from viewing such media. Merely understanding and identifying emotions (i.e., cognitive empathy) might not necessarily, or to a lesser degree, lead to decreased media violence use. To investigate if the selection hypothesis operates differentially for affective empathy and cognitive empathy, we test the following two hypotheses:

H1b: Affective empathy has a negative longitudinal effect on adolescents' media violence exposure.
H2b: Cognitive empathy has a negative longitudinal effect on adolescents' media violence exposure.

EQUATING EMPATHY AND SYMPATHY

The second conceptual issue present in existing research is that most scholars have equated empathy with sympathy. Sympathy refers to feelings of concern and sorrow about distressful events in another person's life (Clark, 2010). Although affective empathy and sympathy are both emotional reactions to the perceived emotions of another person, in affective empathy, the emotion is congruent with the perceived emotion whereas, in sympathy this is not the case. For example, in the case of someone being confronted with a person who is feeling sad, empathy means "feeling with" the other person and, thus, feeling sad. In contrast, sympathy refers to "feeling for" the other person, and, thus, not feeling sadness but concern. A review of the literature indicates that there are several studies which, although purporting to study the relationship between media violence and empathy, have in fact studied sympathy instead (Fraser et al., 2012;

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Mößle et al., 2014; Wei, 2007). A reason for this confusion is that many empathy measures used with adolescents do not distinguish affective empathy from sympathy. For example, Wei (2007) and Fraser et al. (2012), have used the empathic concern subscale of the Interpersonal Reactivity Inventory (IRI; Davis, 1980) in their cross-sectional survey studies on violent game exposure. This subscale measures the "tendency of the respondent to experience feelings of warmth, compassion, and concern for others undergoing negative experiences" (Davis, 1980, p. 6), thus, reflecting sympathy not empathy. Similarly, Mößle et al. (2014) used a 4-item scale in their longitudinal study with items such as "I feel bad for students who are picked on often" and "I often feel compassion for people who are worse off than me." Again, these items represent sympathetic rather than empathetic behaviors. Finally, Krahé and Möller (2010) used the affective empathy subscale of the Basic Empathy Scale (Jolliffe & Farrington, 2006a) to investigate the causal pathways between media violence and empathy. This subscale consists of items such as "When a friend is upset, it really affects me." It is unclear whether these items measure affective empathy or sympathy.

Existing longitudinal work (Krahé & Möller, 2010; Mößle et al., 2014) indicates that media violence exposure is negatively associated with empathy. However, based on their measurement of empathy, it seems likely that it is not empathy but sympathy that is being influenced by media violence. This notion is in line with modern extensions of the GAM, which suggest that desensitization specifically leads to a reduction of sympathy for the victim (Bushman & Anderson, 2009; Carnagey et al., 2007). It is also supported by findings from an experimental study demonstrating a reduction of sympathy (e.g., "At the end of the clip I felt sorry for the victim of violence") after repeated exposure to violent clips (Fanti, Vanman, Henrich, & Avraamides, 2009). Based on the measurement issues associated with prior work, as well as theoretical accounts, we posit the following hypothesis:

H3a: Adolescents' violent media exposure has a negative longitudinal effect on sympathy.

Finally, as with affective empathy, individuals with elevated levels of sympathy would have a strong emotional response (i.e., concern, worry) to violent media content. The selection hypothesis would, therefore, suggest that individuals high in sympathy would use less violent media than individuals with lower levels of sympathy:

H3b: Sympathy has a negative longitudinal effect on the amount of media violence exposure in adolescents.

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METHOD

Participants and Procedure

After receiving approval from the sponsoring institution's institutional review board, a large, private survey research institute in The Netherlands collected the data. A total of 516 families with at least two children between the ages of 10 to 14 years participated in this study. Families were recruited via an existing online panel of approximately 60,000 households representative of the Netherlands. Data collection consisted of two waves, and took place in the adolescents' homes where they filled out a questionnaire on a laptop. Before participants completed the online questionnaire, written informed consent was obtained from the participating adolescent and one of his/her parents. The first wave of data collection was conducted between September and December 2012; the second wave was conducted between September and December 2013. This one-year time interval is consistent with the previous published longitudinal studies on the media violence and empathy relation (Krahé & Möller, 2010; Mößle et al., 2014), which makes comparison possible. Data collection procedures were identical for both waves. To compensate adolescents for their time, families received points to redeem for a variety of prizes provided by the survey company.

As this study was part of a larger study in which a sibling design was necessary, two children from each recruited family participated in the study. In total, 1,032 adolescents (50% female; mean age M = 12.93, SD = 1.39) participated in Wave 1, and 1,011 adolescents participated in Wave 2 (51% female; mean age M = 13.38, SD = 1.37; 98% recontact rate). The final sample consisted of 943 Dutch 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). The final sample consisted of 99.7% sibling pairs; 50.4% were girls; with a mean age at Time 1 (T1) of M = 11.8 years (SD = 1.4 years).

Measures

Media violence

Media violence exposure was measured using direct estimates.[1] Direct estimates are frequently used in survey research to measure media violence exposure (e.g., Fraser et al., 2012; Nikkelen et al., 2014; Slater, 2004; Slater, Henry, Swaim, & Anderson, 2003) and has been found reliable and valid for use with adolescents 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?

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. See Table 1 for descriptive statistics.

Empathy and sympathy

The Adolescent Measure of Empathy and Sympathy (AMES) was used at both time points (Vossen et al., 2015). This measure consists of 12 statements that measure affective empathy (4 items), cognitive empathy (4 items), and sympathy (4 items). For each statement, respondents indicated how often the behavior occurred on a 5-point scale: (1) *never*, (2) *almost never*, (3) *sometimes*, (4) *often*, and (5) *always*. Example items are "When a friend is scared, I feel afraid" (affective empathy), "I can tell when someone acts happy, when they actually are not" (cognitive empathy), and "I feel sorry for someone who is treated unfairly" (sympathy). Confirmatory factor analyses confirmed the three-factor structure of the scale at both Wave 1 (RMSEA = .06, CFI = .93, SRMR = .05) and Wave 2 (RMSEA = .05, CFI = .96, SRMR = .04).[2] Mean scores were calculated for the affective empathy subscale (α = .76/.77 at T1/T2), the cognitive empathy subscale (α = .80/.82 at T1/T2), and the sympathy subscale (α = .69/.74 at T1/T2). See Table 1 for descriptive statistics.

Nonviolent media exposure

Nonviolent media exposure was measured using direct estimates of overall exposure to television and games. Similar to the media violence exposure measure, this measure consisted of two items for both television exposure and electronic games:

1. How often do you watch television programs [play games]?
2. On the days that you watch television programs [play games], how much time do you spend on this per day?

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TABLE 1 Means, Standard Deviations, and Bivariate (Cross-Sectional and Longitudinal) Correlations Between Model Variables.

	Mean (*SD*)		Cross-sectional correlations						Longitudinal correlations	
	T1	T2[b]	1	2	3	4	5	6	MV_{T1} with $outcome_{T2}$	MV_{T2} with $outcome_{T1}$
1. MV	4.82 (7.73)	6.52 (10.15)**	**.61****	−.12**	−.07	−.10**	−.026	−.21**	–	–
2. AE	2.30 (0.78)	2.47 (0.77)**	−.10**	**.53****	.41**	.55**	−.06*	.37**	−.08*	−.34**
3. CE	3.28 (0.77)	3.25 (0.80)	−.09**	.47**	**.57****	.41**	−.09**	.11**	−.07*	.00
4. S	3.22 (0.75)	3.57 (0.75)**	−.14**	.48**	.55**	**.55****	−.06	.26**	−.17**	−.09**
5. NVM	15.71 (14.09)	13.28 (12.74)**	−.11**	−.03	−.06	−01.	**.46****	.08*	–	–
6.Sex[a]	–	–	−.42**	.25**	.20**	.27**	−.04	**1**	**–**	**–**

Note. Media violence and overall media exposure scores reflect hours of exposure per week. The AMES subscales ranged from 1 (*never*) to 5 (*always*); cross-sectional correlations between variables at for T1 are presented above the diagonal; cross-sectional correlations for T2 below the diagonal; correlations in the diagonal are stability coefficients.*$p < .05$, **$p < .01$.

[a]1 = boys, 2 = girls.

[b]Paired sample *t* tests were used to test differences in means of T1 and T2. MV = media violence, AE = affective empathy, CE = cognitive empathy, S = sympathy, NVM= nonviolent media.

The response categories for the first items reached from 0 (*never*) to 7 (*7 days a week*). The second items comprised of 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 television and game exposure. The two variables were then summed to create one variable representing overall media exposure in hours per week. To assess nonviolent media exposure, media violence exposure was subtracted from overall media exposure. See Table 1 for descriptive statistics.

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Analytic Approach

Model variables were first examined for normality and univariate outliers. Since the media violence and nonviolent media exposure was calculated, in part, based on an open-ended question, there were some extreme values. These extreme values were defined as values exceeding the mean +/– 3 times the standard deviation and were recoded to the value of the observation closest to the threshold of mean +/–3 times standard deviation. A total of 17 cases were considered outliers at T1 and 20 cases at T2.[3]

Bivariate correlations were calculated between all variables at both data waves. Following this, cross-lagged panel analyses using robust maximum likelihood (MLR) estimation were performed in Mplus to examine the longitudinal relationship between media violence, empathy, and sympathy. Figure 1 illustrates the statistical model. In this model affective empathy, cognitive empathy, and sympathy are included in one model, where the diagonal paths represent the desensitization process and the selection process. Affective empathy, cognitive empathy, and sympathy are included as latent constructs, while all other variables were included as observed constructs. To correct for the clustered nature of our data (i.e., two adolescents per household) as well as the nonnormality of the data, robust clustered standardized errors were calculated (Múthen & Satorra, 1995). In order to ensure that results reflected media violence specifically, and not media use in general, nonviolent media exposure was included as a covariate (Busching et al., 2015). Additionally, because of well-known gender differences in media violence use (e.g., Lemish, 2007), as well as empathy and sympathy (Lennon, Eisenberg, & Strayer, 1987; Mestre Escriva, Samper Garcia, Frias Navarro, & Tur Porcar, 2009), gender was included as a covariate in all models (see Figure 1). Other potential covariates, such as Socio-Economic Status, age, family conflict and parenting style, proved to be insignificant and were dropped for model parsimony.

To evaluate the fit of the different models, three goodness-of-fit-indices were used: the root mean square error of approximation (RMSEA), the Bentler Comparative Fit Index (CFI), and the standardized root mean square residual (SRMR). Generally, CFI values between .90 and .95, RMSEA values between .05 and .08 and SRMR values between .10 and .08 indicate adequate fit. CFI

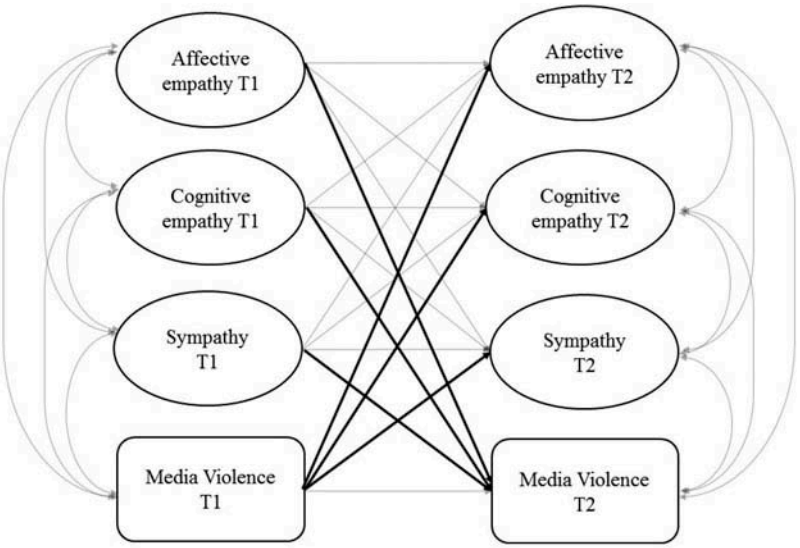

FIGURE 1 Statistical model for the longitudinal relationship between media violence and empathy/sympathy. Affective empathy, cognitive empathy, and sympathy are included as latent constructs. Covariates (i.e., gender and nonviolent media) were included at both time waves. The bolded lines represent the causal paths of interest. Paths from media violence T1 to empathy and sympathy scales at T2 represent the "desensitization hypothesis." Paths from the empathy and sympathy scales at T1 to media violence at T2 represent the "selection hypothesis."

values larger than .95, RMSEA values smaller than .05 and SRMR values of smaller than .08 indicate good model fit (Kline, 2005). Last, we tested the assumption of measurement invariance of the AMES to ensure factor loadings on the AMES subscales were equal over time. Because we use MLR estimation to address the clustered nature of the data, we calculate the Satorra–Bentler (SB) scaled chi-square difference to test the difference between the unconstrained (configural) and the constrained (metric invariance) model (Satorra & Bentler, 2001). Full metric invariance would mean that all factor loadings are equal over time. However, full metric invariance is often considered overly stringent and, as such, the comparison of path coefficients over time is admissible even when some indicators are not invariant (Byrne, Shavelson, & Muthén, 1989; Steenkamp & Baumgartner, 1998). Results show that the full metric invariance model for sympathy model does not significantly differ from the configural model (SB $\Delta\chi^2 = 7.71$, $p = 0.053$). While full metric invariance could not be established for affective empathy and cognitive empathy, we did find partial metric invariance. For both constructs, the model in which three out of four factor loadings were constrained did not statistically differ from the configural model (affective empathy: SB $\Delta\chi^2 = 2.17$, $p = .525$; cognitive empathy: SB $\Delta\chi^2 = 5.72$, $p = .065$). The results presented in the results section are based on the metric invariant cross-lagged models.

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RESULTS

Bivariate Correlations

Table 1 depicts the bivariate correlations between the model variables at T1 and T2. The diagonal shows the stability coefficients of the variables. All variables proved to have stable patterns over time (r = .53–61). Media violence was negatively correlated with affective empathy, cognitive empathy, and sympathy at both T1 and T2, with the exception of cognitive empathy at T1. Furthermore, gender correlated significantly with media violence, affective empathy, cognitive empathy, and sympathy. As expected, media violence exposure was significantly greater for boys compared to girls at both T1 and T2, whereas girls showed higher levels of affective empathy, cognitive empathy, and sympathy compared to boys at both time points.

Causal Pathways

Using a cross-lagged model, we examined the causal relationships between media violence, affective empathy, cognitive empathy, and sympathy. The model had an adequate to good fit to the data (RMSEA = .04, CFI = .92, SRMR = .04). Concerning affective empathy, the paths of interest were the path from affective empathy at T1 to media violence at T2 (Hypothesis 1b, selection process) and from media violence at T1 to affective empathy at T2 (Hypothesis 1a, desensitization process). The results provide support for neither selection (b^* = –.01, CI 95%: [–.12, .10], p = .887) nor for desensitization (b^* = .00, CI 95%: [–.12, .13], p = .950). No causal relationships between affective empathy and media violence were found, and Hypotheses 1a and 1b are rejected. We also investigated the causal relationship between media violence and cognitive empathy (Hypotheses 2a and 2b). As with affective empathy, the results of this model did not provide evidence for selection (b^* = .02, CI 95%: [–.07, .10], p = .720) nor desensitization (b^* = -.02, CI 95%: [–.15, .10], p = .738), indicating no causal relationship between cognitive empathy and media violence. Therefore, Hypotheses 2a and 2b are rejected. Finally, the causal relationship between media violence and sympathy (Hypotheses 3a and 3b) was investigated. Results did not provide evidence for a selection effect (b^* = .02, CI 95%: [–.09, .14], p = .684), rejecting Hypothesis 3b, but did show evidence for desensitization (b^* = –.18, CI 95%: [–.33, –.03], p =.017). Adolescents' exposure to media violence at T1 negatively predicted sympathy at T2, thus, supporting Hypothesis 3a.

DISCUSSION

The aim of the present study was to investigate the longitudinal relationships between media violence, empathy (affective and cognitive), and sympathy.

Driven by concerns associated with measurement validity in previous studies, this study was designed to distinguish between affective empathy, cognitive empathy, and sympathy. Results suggest that the previously found negative influence of media violence on empathy (Krahé & Möller, 2010; Mößle et al., 2014) actually reflects a negative influence on sympathy.

Using longitudinal data from adolescents, we tested whether media violence exposure influenced empathy/sympathy over time (desensitization). Based on previous work and theory, we hypothesized that media violence would be negatively associated with affective empathy (Hypothesis 1a), cognitive empathy (Hypothesis 2a), and sympathy (Hypothesis 3a). Although findings for affective empathy and cognitive empathy were not supported, results do indicate a longitudinal relationship between media violence and sympathy. More specifically, teens who consume media violence subsequently feel less concern for other people in distress but do not necessarily share or understand the emotions of other people to a lesser degree. Previous cross-sectional (Bartholow et al., 2005; Fraser et al., 2012; Wei, 2007) and longitudinal research (Krahé & Möller, 2010; Mößle et al., 2014) with adolescents has reported a negative relationship between media violence and affective empathy. However, as discussed, the measurement of empathy in this earlier research, by means of the empathic concern (EC) scale of the IRI, much more closely aligns with the definition of sympathy than with affective empathy. As such, the findings from this study clarify and, in a sense, replicate previous work. Future research should carefully take into account the conceptualization and measurement of empathy as well as consider whether sympathy may actually be the construct of interest.

With these findings in mind, the question arises as to why media violence would influence sympathy and not affective or cognitive empathy. As previously mentioned, several studies have based their argument for the relationship between media violence and empathy on the process of desensitization. Repeated exposure to media violence is expected to result in a decreased physiological, emotional, and cognitive response to real life violence (Anderson & Bushman, 2002). While some researchers suggest that this reduction in emotional response will result in a decrease in empathy (e.g., Bartholow et al., 2005; Fraser et al., 2012; Funk, 2005; Krahé, 2014; Mößle et al., 2014), our results suggest that this logic may be erroneous and that it is sympathy—not empathy—that is influenced in this process of desensitization. Although we can only speculate at this time as to why this relationship is present, it is possible that the automaticity of sympathy may in part explain this relationship. Sympathy is argued to reflect an automatic response to or awareness of suffering and a subsequent urge to alleviate this suffering (Maibom, 2009; Wispé, 1986). Empathy, on the other hand, is a more or less effortful process of sharing and understanding the emotional state of another person by using mimicry and imagination (Wispé, 1986). It is possible that desensitization has a stronger

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influence on automatic responses, such as sympathy, in contrast to more effortful and controlled responses such as empathy. Follow-up experimental studies, which can help to better understand the process of desensitization in the context of empathy and sympathy, is an important next step.

In terms of the selection paradigm, there was no evidence in this study that affective empathy, cognitive empathy, or sympathy influenced media violence exposure over time. Krahé and Möller (2010) and Möβle et al. (2014) similarly did not find support for a selection effect, and neither did several studies on the longitudinal relationship between media violence and aggression (Huesmann, Moise-Titus, Podolski, & Eron, 2003; Krahé & Möller, 2010). Despite these findings, it is possible that empathy and sympathy do influence media preferences but that this influence occurred earlier in childhood and remain static during adolescence. Research investigating the relationships between media use and the three dimensions in a younger sample would be an important next step. Alternatively, it may be that empathy and sympathy do not induce media preference at all or are associated with more specific media preferences. For example, media violence can occur across several media genres (e.g., action, drama, and thrillers). Researchers have posed that empathy is positively related to enjoyment of drama (Oliver, 1993) and negatively related to enjoyment of horror (Hoffner & Levine, 2005). Both drama and horror are genres that can contain violence but their relation to empathy is opposite. It may be that while, overall, empathy and sympathy do not predict media violence exposure, they do predict exposure to specific genres of media violence. Research asking whether and how these variables predict media genre preference may offer a more nuanced approach to evaluating how socioemotional variables such as empathy and sympathy influence media selection.

Last, it is important to recognize that while this study revealed no evidence of a causal relationship between affective empathy, cognitive empathy, and media violence, they are still important constructs to consider in media violence research. For example, previous research has indicated that the ability to understand and share the emotions of others is positively related to transportation into a narrative (Green & Brock, 2000). The level of transportation into a narrative is suggested to determine the extent to which attitudes, beliefs, and behaviors are changed (Green & Clark, 2013). As with narrative processing in general, it is possible that affective and cognitive empathy may instead function as moderators in the relationship between media violence and aggression with higher levels of each working to heighten the influence of media violence. Research that evaluates whether and how affective and cognitive empathy may moderate the relationship between media violence and aggression would be a worthwhile next step.

In conclusion, using longitudinal data from a sample of adolescents, this study provides further evidence for a desensitizing influence of media violence on the emotional reactivity of adolescents. Although previous studies

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had suggested that empathy would be affected by media violence, by using a measurement tool which delineated between types of empathy (cognitive, affective) and sympathy, we learned that media violence influences sympathy, not empathy. This is an important finding both methodologically and practically. Methodologically, the findings call attention to the importance of distinguishing between empathy (both affective and cognitive) and sympathy in media violence research. In practice, these findings indicate that teens, who consume greater amounts of media violence over time, feel less concern for people in distress. Considering that sympathy is associated with moral judgment (Eisenberg, Cumberland, Guthrie, Murphy, & Shepard, 2005), prosocial behavior (Malti, Gummerum, Keller, & Buchmann, 2009), constructive social behavior, and low negative emotionality (Murphy, Shepard, Eisenberg, Fabes, & Guthrie, 1999), it is critical that we understand both when mediated environmental influences can weaken sympathy as well as ways to reduce this harm.

NOTES

1. While the term "direct estimates" might give the impression that the measurement is based on observation, it is a term generally used by researchers because the participant is directly asked about his/her media exposure as opposed to asking for program titles that he/she watched and coding these titles for specific content.

2. Confirmatory factor analyses confirmed that in both data waves, the three-factor solution performed better than a two-factor solution (Wave 1: SB $\Delta\chi^2 = 55.83, p < .001$, Wave 2: SB $\Delta\chi^2 = 1324.0, p < .001$) or a one-factor solution (Wave 1: SB $\Delta\chi^2 = 431.78, p < .001$, Wave 2: SB $\Delta\chi^2 = 490.84, p < .001$).

3. Analyses conducted with and without recoding the outliers yielded similar results.

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