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Abstract

Despite recent growth of research on the effects of prosocial media, processes underlying these effects are not well understood. Two studies explored theoretically relevant mediators and moderators of the effects of prosocial media on helping. Study 1 examined associations among prosocial- and violent-media use, empathy, and helping in samples from seven countries. Prosocial-media use was positively associated with helping. This effect was mediated by empathy and was similar across cultures. Study 2 explored longitudinal relations among prosocial-video-game use, violent-video-game use, empathy, and helping in a large sample of Singaporean children and adolescents measured three times across 2 years. Path analyses showed significant longitudinal effects of prosocial- and violent-video-game use on prosocial behavior through empathy. Latent-growth-curve modeling for the 2-year period revealed that change in video-game use significantly affected change in helping, and that this relationship was mediated by change in empathy.

Keywords

mass media, cross-cultural differences, social behavior, prosocial media, violent media, prosocial behavior, empathy, helping, general learning model, prediction

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Recent years have witnessed increasing interest in positive effects of prosocial media (e.g., Greitemeyer, 2011a, 2011b). A growing research literature has demonstrated that prosocial media can foster prosocial interactions. Significant effects of prosocial media on helping have been demonstrated for a variety of media, including television shows (Mares & Woodard, 2005), video games (Saleem, Anderson, & Gentile, 2012a), and music lyrics (Greitemeyer, 2009).[1] For example, Gentile et al. (2009) found that adolescents' greater use of prosocial video games was related to more frequent helping,

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cooperation, and sharing, in cross-sectional, longitudinal, and experimental studies. Other studies have shown significant associations between watching prosocial television programs and performing prosocial acts in real life (e.g., Rosenkoetter, 1999; Sprafkin & Rubinstein, 1979).

Experimental studies have demonstrated short-term causal effects of prosocial media. For example, Greitemeyer and Osswald (2010) showed that playing prosocial video games made participants more likely to help researchers pick up fallen pencils, agree to participate in further experiments, and come to the aid of a female experimenter who was being harassed by an ex-boyfriend.

Longitudinal studies suggest that habitual use of prosocial media can cause long-term increases in prosocial behavior. Gentile et al. (2009) found that the amount of prosocial-video-game play predicted increases in prosocial behavior over a period of 3 to 4 months. D. R. Anderson et al. (2000) found that children who watched the television show *Blue's Clues* showed significantly greater increases in prosocial behaviors than nonviewers. Together, correlational, experimental, and longitudinal studies in this area provide evidence that prosocial media have effects on prosocial behavior.

These effects can be understood within the framework of the general learning model, an extension of the general aggression model (C. A. Anderson & Bushman, 2002; Barlett & Anderson, 2013; Buckley & Anderson, 2006; Gentile, Groves, & Gentile, in press; Maier & Gentile, 2012). The general learning model is a metatheoretical framework that integrates key ideas from several more specific models, including social learning theory and social-cognitive theory (Bandura, 1973, 1983), script theory (Huesmann, 1986, 1998), cognitive-neoassociation theory (Berkowitz, 1984), cultivation theory (Comstock & Scharrer, 2007), desensitization theory (Carnagey, Anderson, & Bushman, 2007), and social information-processing theory (Crick & Dodge, 1994). It provides a general framework for understanding how long-term beliefs, attitudes, and affective traits are developed from various life experiences.

According to the general learning model, people learn from environmental interactions, including from the media, and they do so through several learning mechanisms. Media content determines much of what is learned. Violent media are likely to increase the probability of aggressive behavior and decrease the probability of prosocial behavior because of changes in attitudes, beliefs, affect, and scripts. Prosocial media are expected to decrease the likelihood of aggression and increase the likelihood of prosocial behavior. In short-term contexts, prosocial media are thought to affect behavior by priming prosocial cognitions (including scripts) and increasing positive affect (Saleem et al., 2012a; Saleem, Anderson, & Gentile, 2012b). In long-term contexts, prosocial media are posited to affect behavior through long-term changes in beliefs, attitudes, behavioral scripts, and affective traits.

Although effects of prosocial media have been demonstrated, processes underlying these effects have been less extensively researched and are less understood than processes underlying the effects of violent media (e.g., C. A. Anderson et al., 2003). At present, there is empirical support for short-term predictions of the general learning model concerning prosocial media's effects; several experimental studies have demonstrated short-term effects of prosocial media on helping using diverse samples, manipulations, and measures (Barlett & Anderson, 2013). These studies point to empathy as a key mediator of short-term effects of prosocial media (Greitemeyer, 2009; Greitemeyer, Osswald, & Brauer, 2010). However, no studies have examined long-term mediators of prosocial media's effects on helping. Empirical evidence concerning potential moderators of these relationships is also lacking. Whereas some studies suggest that age, culture, and parental involvement in media habits may significantly moderate the effects of media violence (e.g., C. A. Anderson et al., 2003; C. A. Anderson, Gentile, & Buckley, 2007), the meta-analysis by C. A. Anderson et al. (2010) did not show significant effects of culture or age on the effect sizes for the effects of violent media on prosocial behavior. This evidence suggests that effects of prosocial media may also be similar across cultures, but no comparable data are as yet available to test this prediction.

To address these gaps, we conducted two studies on potential mediators and moderators of prosocial media's effects on helping. Study 1 examined relations among prosocial-media use, empathy, and helping in samples from seven countries. We hypothesized that greater prosocial-media use would be associated with more frequent helping (defined here as voluntary behavior intended to benefit another person) and that this effect would be at least partially mediated by empathy (the tendency to be aware of and react to the mental and emotional states of other people; Davis, 1983). Given past findings of prosocial media's effects on empathy and prosocial behavior in short-term contexts (e.g., Greitemeyer, 2009; Greitemeyer et al., 2010), we focused on empathy as a potential key mediator of the effects of habitual prosocial-media use on prosocial behavior in the long term. Study 1 also explored gender, age, and culture as potential moderators. On the basis of the general learning model, we expected that the effects of prosocial media on empathy and prosocial behavior would generalize across gender, age, and culture.

Study 2 examined relations among prosocial- and violent-media use, empathy, and helping in a longitudinal sample of 3,034 children and adolescents measured three times over a period of 2 years. The longitudinal

design allowed for stronger tests of our causal mediation model. We hypothesized that prosocial-media use would predict increases in trait empathy and prosocial behavior over time.

Study 1

Method

Participants. This cross-sectional correlational study explored relations among prosocial-media use, empathy, and prosocial behavior across cultures. Samples were obtained in seven countries: Australia (426 participants), China (203 participants), Croatia (438 participants), Germany (200 participants), Japan (395 participants), Romania (233 participants), and the United States (307 participants). The total sample of 2,202 adolescents and young adults was 40.0% male and 59.6% female (0.4% of participants did not report their gender) and had a mean age of 21 years (*SD* = 5.6).

Measures. Participants responded to a questionnaire either online or in face-to-face interviews by trained research assistants. The choice of an online or in-person questionnaire was based on appropriateness to each country.

Media use was measured using a version of the General Media Habits Questionnaire (C. A. Anderson & Dill, 2000; Gentile, Lynch, Linder, & Walsh, 2004). Participants listed their three favorite television shows, three favorite movies, and three favorite video games. They rated each show, movie, and game separately for how frequently they watched or played it (nine items; 5-point scale from *watch/play once a month or less* to *watch/play 5 or more times a week*).

Participants rated each of their listed television shows and movies for prosocial content ("How often do characters help each other?") and for violent content ("How often do characters try to physically injure each other?"). These two items were rated on 7-point scales that ranged from *never* to *all the time*. To capture the more active and varied characteristics of video-game play, we used two items to measure prosocial content in each game ("How often do characters help each other in this game?" and "How often do you help others in this game?"). Similarly, two items were used to measure violent content in each game ("How often do characters try to physically injure each other in this game?" and "How often do you try to physically injure players in this game?"). Again, 7-point scales ranging from *never* to *all the time* were used. For each video game listed by the participant, ratings on the two prosocial-content items were averaged to create a prosocial-content score comparable to the prosocial-content score for each television show and movie. Similarly, ratings on the two violent-content items were averaged. Thus, each of the (up to) nine screen entertainment products listed (three TV shows, three movies, three video games) had a frequency score, a prosocial-content score, and a violent-content score. Such self-ratings of media content have been shown to correlate highly with and yield validities similar to expert ratings (Gentile et al., 2009; Busching et al., 2013).

Empathy was measured by the empathic-concern and perspective-taking subscales from the Interpersonal Reactivity Index (IRI; Davis, 1980, 1983; 14 items). The IRI measures empathy as a stable personality characteristic. An example item is "Before criticizing somebody, I try to imagine how I would feel if I were in their place." Items were rated on a scale from 1 (*does not describe me well*) to 5 (*describes me very well*). Empathy scores were computed by averaging across the 14 items.

Prosocial behavior was measured using the Brief Prosocial Scale (adapted from P. C. Cheung, Ma, & Shek, 1998; 10 items). An example item is "I try to be helpful to people even if I don't expect to see them ever again." Items were rated on a scale from 1 (*extremely uncharacteristic of me*) to 7 (*extremely characteristic of me*). Scores were averaged across the 10 items.

Also assessed were gender, age, race, grade point average, socioeconomic status, and parental education.

Results

Preliminary analyses. To calculate total prosocial-media exposure, we multiplied the frequency of watching or playing each favorite television show, movie, and video game by its corresponding prosocial-content rating and then summed these nine products. Violent-media exposure was calculated similarly. Total screen time was computed by summing participants' ratings of how frequently they watched and played the television shows, movies, and video games that they had listed as their favorites. Descriptive statistics for the scales in this study are shown in Table 1. (See Section 1 of the Supplemental Material available online for correlations between the main variables.) Race, grade point average, socioeconomic status, and parental education were not significantly related to media habits or prosocial behaviors, so these variables were excluded from further analyses. On the basis of geographical location and scores on the cultural dimension of individualism-collectivism (Hofstede, 1980; Hofstede, Hofstede, & Minkov, 2010), we divided the nations into three cultural groups: individualistic Western countries (Australia, Germany, and the United States), collectivistic East European countries (Croatia and Romania), and collectivistic East Asian countries (China and Japan).

Table 1. Mean Scores and Reliabilities for the Main Scales of Interest in Study 1

Variable	Number of items	Mean α	Country means						
			Australia	China	Croatia	Germany	Japan	Romania	United States
Prosocial-media use	9	.82	110.02 (38.59)	91.07 (42.36)	62.27 (32.64)	61.29 (29.35)	93.94 (41.57)	66.57 (28.55)	74.28 (26.11)
Violent-media use	9	.74	82.00 (41.60)	55.02 (36.00)	52.07 (32.2)	38.13 (24.37)	58.80 (31.70)	43.84 (28.13)	70.40 (44.55)
Total screen time	9	.78	21.60 (10.26)	18.56 (7.35)	15.17 (7.47)	13.32 (5.97)	20.93 (7.22)	16.74 (6.67)	22.01 (7.46)
Empathy	14	.76	4.64 (0.76)	3.69 (0.55)	3.41 (0.48)	3.77 (0.46)	3.46 (0.43)	3.42 (0.59)	3.63 (0.58)
Prosocial behavior	10	.78	5.17 (0.88)	5.09 (0.73)	4.89 (0.89)	5.33 (0.70)	4.92 (0.87)	4.88 (0.97)	5.01 (0.80)

Note: Standard deviations are given in parentheses.

Multigroup confirmatory factor analyses were conducted with Mplus 6.1 (Muthén & Muthén, 2010) to test the measurement equivalence of empathy and prosocial behavior across cultural groups. Missing data were treated using full-information maximum likelihood estimation. Because of the large sample size, differences in the comparative-fit index (CFI), rather than nested chi-square tests, were used to test invariance (G. W. Cheung & Rensvold, 2002). A difference (in absolute value) between two CFIs of less than .01 suggests invariance. A measurement model of empathy and prosocial behavior across cultures and without parameter constraints showed adequate model fit, $\chi^2(32) = 121.74$, $p < .01$; Tucker-Lewis index (TLI) = .98; CFI = .98; root-mean-square error of approximation (RMSEA) = .06, 90% confidence interval (CI) = [.05, .08]. The results of cross-group equality-constrained models (see Section 2 of the Supplemental Material) established metric equivalence for the measures of empathy and prosocial behavior across the cultural groups. Therefore, in the main analyses, the forms and factor loadings of empathy and prosocial behavior were constrained to be equal across the groups.

Main results. A structural model of media use, empathy, and prosocial behavior was examined (Fig. 1). Total screen time, violent-media use, gender, and age were statistically controlled. This model had good fit, $\chi^2(52) = 187.13$, $p < .01$; TLI = .96; CFI = .98; RMSEA = .05, 90% CI = [.04, .06]. Within each group, greater prosocial-media use was linked to higher levels of prosocial behavior; this association was fully mediated by empathy. Constraining the indirect effects of prosocial-media use on prosocial behavior through empathy to be equal across groups resulted in a significantly poorer model fit (ΔCFI = .03). Paired comparisons showed significant differences between all three groups (ΔCFI > .01 for all three paired comparisons). Thus, the effects of prosocial media differed among the cultural groups. Nonetheless, the indirect effects of prosocial-media use on prosocial behavior through empathy were of similar magnitudes in all three groups (standardized indirect effect = 0.38 for Western countries, 0.21 for East European countries, and 0.28 for East Asian countries, all *p*s < .01). These results suggest considerable cross-cultural generalization of the links among prosocial-media use, empathy, and prosocial behavior.

To examine gender as a potential moderator, we ran three series of multigroup models comparing results for men and women within each cultural group. As in the previous model, prosocial-media use was entered as a predictor of helping, with empathy as a mediator, and with total screen time, violent-media use, and age statistically controlled. Good model fit was obtained for an unrestricted multigroup model—Western sample: $\chi^2(60) = 146.06$, $p < .01$; TLI = .96; CFI = .97; RMSEA = .06, 90% CI = [.04, .08]; East European sample: $\chi^2(60) = 107.58$, $p < .01$; TLI = .96; CFI = .97; RMSEA = .05, 90% CI = [.03, .06]; East Asian sample: $\chi^2(60) = 98.04$, $p < .01$; TLI = .95; CFI = .96; RMSEA = .05, 90% CI = [.03, .06]. Constraining path coefficients from prosocial-media use to empathy and from empathy to prosocial behavior to be equal across genders did not result in a significant reduction in model fit, ΔCFI = .00 for each of the three cultural groups. Thus, prosocial-media effects were similar for men and women.

In our next model, we examined age as a moderator by adding Age × Prosocial-Media Use and Age × Violent-Media Use interaction terms. No significant interactive effects on empathy or helping were found (all *p*s > .05).

Discussion

Study 1 yielded similar paths from prosocial-media use to prosocial behavior via empathy across the seven

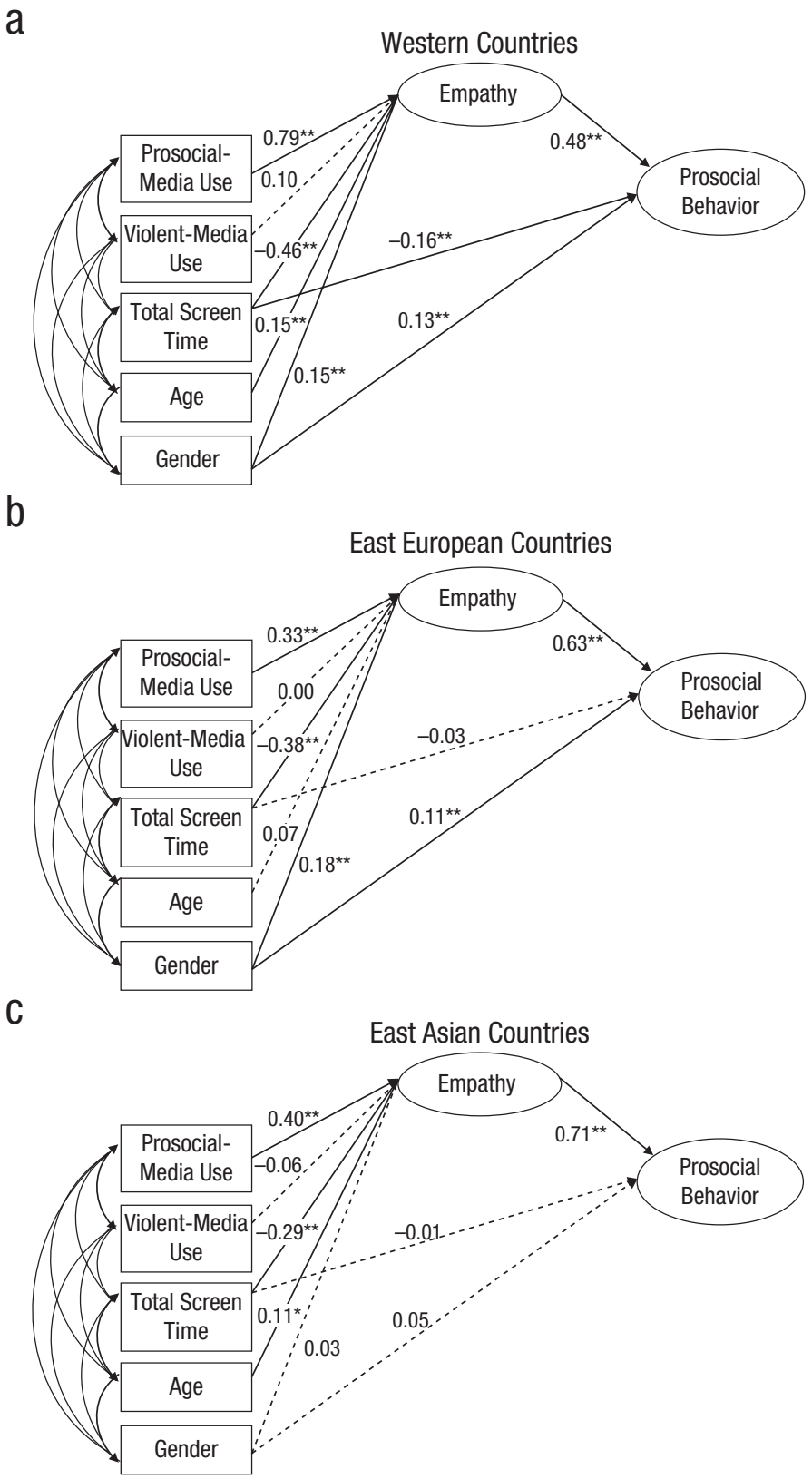

Fig. 1. Results from Study 1: multigroup structural equation model of the effects of prosocial-media use on prosocial behavior, as mediated by empathy. Results are shown separately for the Western, East European, and East Asian cultural groups. Standardized coefficients are shown (*$p < .05$, **$p < .01$). Solid lines represent significant effects, and dashed lines represent nonsignificant effects.

countries. These results are consistent with a causal theoretical model linking prosocial-media use to helping behavior through changes in empathy, but of course the cross-sectional nature of these data precludes strong causal conclusions. Therefore, we conducted a 2-year, three-wave longitudinal study for a more thorough test.

Study 2

Method

Participants. The initial sample in this study consisted of 3,034 children and adolescents from six primary and six secondary schools in Singapore (73% male, 27% female; mean age = 11.2 years, *SD* = 2.1). Data were collected annually, from 3,034, 2,360, and 2,232 participants in Waves 1 through 3, respectively. Questionnaires were administered in class by teachers who received detailed instructions from research personnel. The response rate was 99% at Wave 1, 87.5% at Wave 2, and 85% at Wave 3.

Measures. For practical reasons, our assessment of media use focused on video games only. At each wave, participants listed their three favorite video games and indicated how many hours they spent playing each game on a usual school day and on a usual weekend (total of six items). The 16-point rating scale ranged from *none* to *more than 10 hours*. Participants also indicated how frequently each of their listed games contained violent themes (two items per game; e.g., "How often do you shoot or kill creatures in this game?") and prosocial themes (two items per game; e.g., "How often do you help others in this game?"). The 4-point rating scale for these items ranged from *never* to *almost always*. Children who reported playing no video games received a score of 0 for both prosocial- and violent-game exposure.

The Children's Empathic Attitudes Questionnaire (Funk, Fox, Chan, & Curtiss, 2008; 16 items) measured trait empathy. An example item is "I would feel bad if my mother's friend got sick." Items were rated on a 3-point scale (*no, maybe*, and *yes*).

The helping and cooperation subscales of the Prosocial Orientation Questionnaire (P. C. Cheung et al., 1998; 18 items) measured prosocial behavior. An example item is "I would spend time and money to help those in need." Items were rated on a scale from 1, *strongly disagree*, to 5, *strongly agree*. Also assessed were gender, age, race, socioeconomic status, school grades, and parental education.

Results and discussion

Preliminary analyses. Total video-game time was calculated as the total time spent playing video games per week. To reduce positive skewness, we applied a square-root transformation to these scores. Prosocial and violent content were calculated as average ratings of the three games. Table 2 displays basic statistics for the main measures. At each wave, prosocial-media use was positively related to empathy (rs = .10, .09, and .08 for Waves 1, 2, and 3, respectively; all ps < .01) and to prosocial behavior (rs = .09, .08, and .06, respectively; all ps < .01). Violent-media use was negatively related to empathy (rs = −.15, −.14, and −.14, respectively; all ps < .01) and to prosocial behavior (rs = −.13, −.13, and −.13, respectively; all ps < .01). (See Section 3 of the Supplemental Material for more details on the correlations among the main measures.) Race, socioeconomic status, school grades, and parental education were unrelated to the main measures of interest, so these variables were excluded from further analyses.

Longitudinal results. Using Mplus 6.1, we ran an autoregressive path model with prosocial- and violent-video-game use at Time 1 as predictors of prosocial behavior at Time 3, with empathy at Time 2 as a mediator (Fig. 2). Missing data were treated using full-information maximum likelihood estimation. Initial levels of prosocial behavior, empathy, and total amount of video-game time were included as predictors, along with gender. The

Table 2. Mean Scores and Reliabilities for the Main Scales of Interest in Study 2

Variable	Number of items	Time 1		Time 2		Time 3	
		α	*M*	α	*M*	α	*M*
Prosocial-video-game use	6	.85	1.34 (0.87)	.84	1.28 (0.88)	.85	1.35 (0.89)
Violent-video-game use	6	.75	1.39 (0.91)	.75	1.27 (0.90)	.76	1.15 (0.91)
Total video-game play time	6	.88	3.53 (2.84)	.89	4.05 (2.47)	.89	3.88 (2.42)
Empathy	16	.86	2.32 (0.40)	.87	2.32 (0.39)	.89	2.33 (0.39)
Prosocial behavior	18	.84	3.05 (0.45)	.84	3.05 (0.43)	.84	3.05 (0.41)

Note: Standard deviations are given in parentheses.

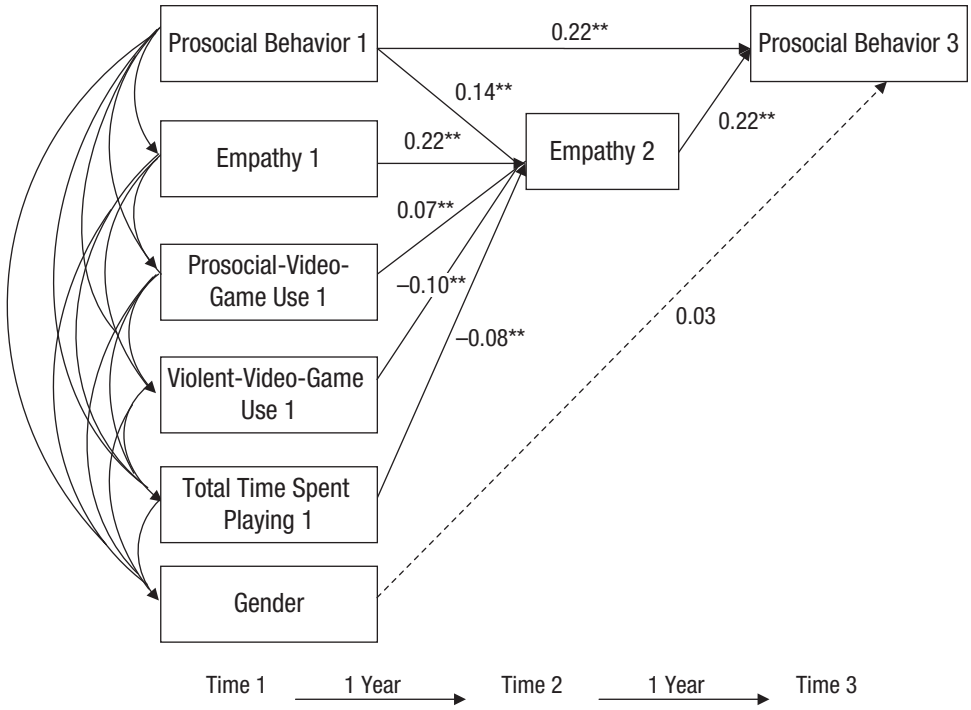

Fig. 2. Results from Study 2: path model of prosocial-video-game use at Time 1 as a predictor of prosocial behavior at Time 3, as mediated by empathy at Time 2. Standardized coefficients are shown (**$p < .01$). Solid lines represent significant effects, and the dashed line represents a nonsignificant effect.

model yielded a good fit, $\chi^2(5) = 9.05$, $p > .05$; TLI = 0.98; CFI = .99; RMSEA = .02, 90% CI = [.00, .03]. Prosocial-video-game use at Time 1 had a significant positive indirect effect on prosocial behavior at Time 3 through empathy at Time 2. Violent-video-game use at Time 1 had the opposite effect on prosocial behavior at Time 3, through its effect on empathy at Time 2. Two alternative path models were tested to explore the possibility of reverse causal effects between prosocial behavior and media habits and reverse mediation of media effects on empathy through changes in prosocial behavior (see Section 4 in the Supplemental Material). No evidence of such effects was found. However, the indirect effects of prosocial- and violent-video-game use on later prosocial behavior through empathy remained significant. These longitudinal results strongly support our causal theoretical model.

To check for potential effects of gender as a moderator, we conducted a multigroup path model. Good model fit was obtained, $\chi^2(10) = 16.47$, $p > .05$; TLI = 0.971; CFI = .99; RMSEA = .02, 90% CI = [.00, .04]. For both boys and girls, prosocial-media use predicted greater helping indirectly through its effect on empathy. Similarly, violent-media use predicted less helping through its effect on empathy in both groups. Constraining path coefficients to be equal across genders did not result in a significant reduction in model fit (ΔCFI = .00). Thus, the longitudinal effects of media on helping were essentially equivalent for males and females.

To examine age as a moderator, we added Age × Media Use interaction terms to the model. Interactive effects of age and media habits on empathy and prosocial behavior were not significant (all ps > .05).

Latent-growth-curve results. We used latent-growth-curve modeling to further examine these relations over time (Fig. 3). Latent-growth-curve modeling does not test causal relations, as do autoregressive path models, but it can provide useful insights into relations among variables over time once a causal order has been established. Good model fit was obtained, $\chi^2(46) = 145.9$, $p < .01$; TLI = .98; CFI = .99; RMSEA = .03, 90% CI = [.02, .03]. Higher initial levels of prosocial-video-game use predicted higher initial levels of prosocial behavior (standardized indirect effect through the intercept of empathy = 0.33, $p < .01$). In contrast, higher initial levels of violent-video-game use predicted lower initial levels of prosocial behavior (standardized indirect effect through the intercept of empathy = –0.61, $p < .01$). The rate of change in prosocial gaming had both a positive direct effect on change in helping (standardized effect = 0.66, $p < .01$) and a positive indirect effect on change in helping through change in empathy (standardized effect = 0.20, $p < .02$). In comparison, the rate of change in violent gaming negatively

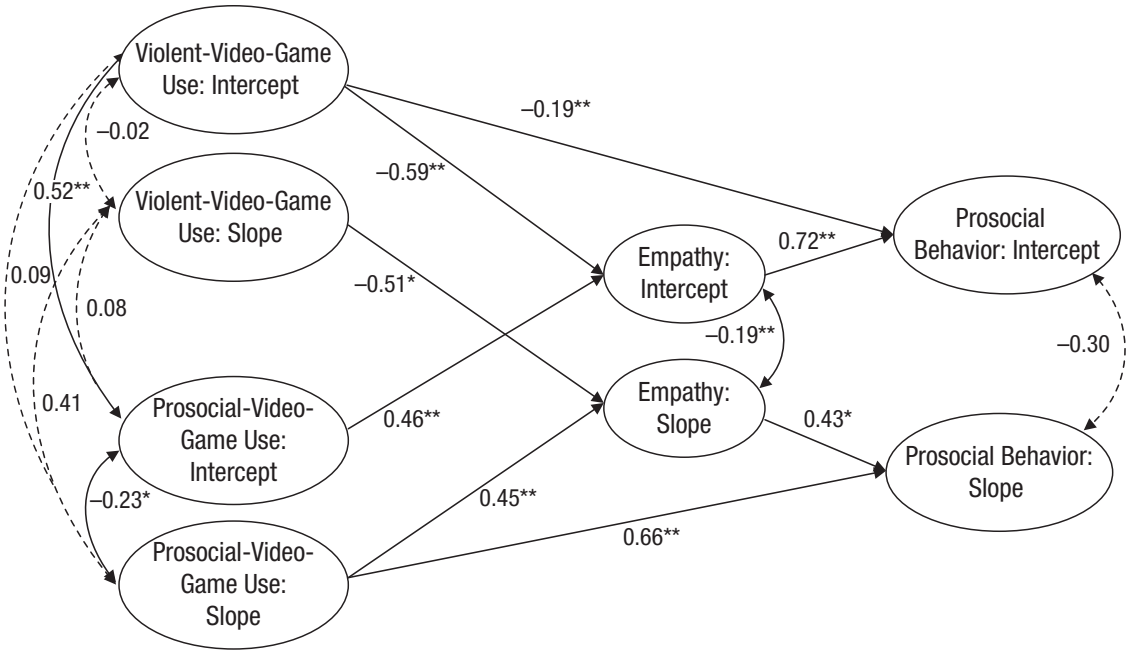

Fig. 3. Results from Study 2: latent-growth-curve model of prosocial-video-game use, violent-video-game use, empathy, and prosocial behavior over a 2-year period. Gender and amount of play at Time 1 are included as covariates. Standardized coefficients are shown (*$p < .05$, **$p < .01$). Solid lines represent significant effects, and dashed lines represent nonsignificant effects.

predicted change in prosocial behavior through change in empathy (standardized effect = −0.22, $p < .02$).

General Discussion

Main findings and implications

The main goal of the present research was to explore mediators and moderators of the effects of prosocial media on prosocial behavior. Both studies demonstrated that prosocial-media use is positively associated with prosocial behavior in real life. More important, both studies found empathy to be a key mediator of these effects. The longitudinal findings from Study 2 are especially noteworthy because they demonstrate simultaneous positive long-term effects of prosocial media and negative long-term effects of violent media on later prosocial behavior. Most important of all, both the prosocial- and the violent-media effects on prosocial behavior were mediated by changes in empathy, and were evident even after we controlled for relevant covariates.

Another interesting finding is that in both studies, greater total media time, independent of prosocial or violent content, was associated with less prosocial behavior, an effect mediated through empathy (see Figs. 1 and 2). At first glance, this effect of total media time might be seen as the simple result of more media time automatically meaning that less time is available to help other people. However, the fact that this effect was mediated by empathy suggests that some other process must underlie this effect. Perhaps excessive time engaged in entertainment media leads to fewer socialization opportunities in which one can learn empathy for others.

On the whole, the present results complement past findings from short-term experimental studies (e.g., Greitemeyer & Osswald, 2009, 2010; Saleem et al., 2012a, 2012b) and suggest that short-term effects of prosocial and violent media accumulate, bringing about lasting changes in behavioral patterns and personality traits. These findings support long-term predictions of the general learning model, the general aggression model, and other social-cognitive models of personality.

Our findings advance theory in several ways. Study 1 is the first to directly compare the effects of prosocial media on empathy and helping across cultures. It demonstrated some intercultural differences, but also showed mostly similarities in prosocial media's effects. It also is the first study to demonstrate empirically that trait empathy appears to mediate long-term effects of prosocial media on helping. Another major theoretical advance is the finding from Study 2 that over a 2-year period, trait empathy was significantly affected by the amount of time

youth spent consuming prosocial and violent media. These findings constitute novel evidence that entertainment media not only can cause short-term changes in empathy in laboratory studies, but also can lead to stable changes in empathy as a personality trait.

Other findings of note concern potential moderators of prosocial media's effects on prosocial behavior. In Study 1, greater prosocial-media use predicted higher levels of prosocial behavior in samples from Western, East European, and East Asian countries. Empathy significantly mediated this relation in all three cultural groups. Although multigroup modeling demonstrated significant differences in the magnitude of prosocial media's effects across the cultural groups, the direction of the effects was the same. In short, the links between prosocial-media use and prosocial behavior generalize across cultures. The cross-cultural differences that did appear may be the result of differences between individualistic and collectivistic cultures in social norms and situational affordances of prosocial behaviors (Miller, Bersoff, & Harwood, 1990; Yamagishi & Yamagishi, 1994). For example, the expression of prosocial behavior learned from prosocial media may be more strongly regulated by appropriateness in the immediate social situation in collectivistic cultures than in individualistic cultures. This speculation suggests future research directions.

Potential effects of gender as a moderator were examined in both studies. We found that links among prosocial-media use, empathy, and helping were similar for males and females. The literature on media violence has reported similar cross-group robustness of media effects (e.g., C. A. Anderson et al., 2003; C. A. Anderson et al., 2007). The cross-culture, cross-age, and cross-gender similarity of the media effects in the present studies further suggests that the mechanisms through which media affect behavior are fairly general.

Limitations

Both studies were based on self-reports, so these findings may have been influenced by self-report biases. In future studies, it may be useful to employ other measures of media use, empathy, and prosocial behaviors (such as informant reports or observational measures, although it seems unlikely that such measures would be more accurate than self-reports in the case of media use or empathy). It is possible that both social desirability and self-enhancement tendencies influence self-reports of prosocial behavior. However, past research supports the construct and predictive validity of the prosocial-behavior scales used in these two studies (e.g., P. C. Cheung et al., 1998; Gentile et al., 2009). Furthermore, such measurement error would tend to weaken the observed relationship between prosocial-media use and prosocial behavior.

In both studies, the effects of prosocial media on trait empathy and helping were small. However, effects of this magnitude are to be expected given the long-term stability of personality traits and the many factors that may influence them (Caspi, Roberts, & Shiner, 2005; Roberts, Walton, & Viechtbauer, 2006). The fact that a single environmental factor such as prosocial-media consumption was found to predict significant changes in trait empathy and prosocial behavioral tendencies over time is noteworthy. Furthermore, the positive associations among the multiple predictors may well have led to underestimations of the true effect sizes, a necessary but conservative statistical consequence of such data (Prot & Anderson, 2013).

Conclusion

This research provides evidence that prosocial-media use can lead to long-term increases in trait empathy and helping. Furthermore, these relationships generalized across gender, age, and culture. These findings underscore the fact that media are powerful teachers. Just as exposure to violent media can lead to negative outcomes such as desensitization and increased aggression, use of prosocial media can lead to positive changes such as increased empathy and helping. Coupled with the rapid increases in media use among youth in developed countries, our studies suggest that accumulation of media effects has the potential to significantly alter important interpersonal behaviors in both positive and negative ways. Knowledge of these long-term effects may help parents, policymakers, and other concerned citizens make decisions about what kind of society they want for the future and how to create it.

Author Contributions

Data collection in Study 1 was conducted by C. A. Anderson, E. Swing, D. A. Gentile, S. Prot, K. Suzuki, B. Krahé, Y. Horiuchi, M. Jelic, W. Liuqing, P. D. Petrescu, A. Sakamoto, S. Tajima, R. A. Toma, W. Warburton, and X. Zhang. Data collection in Study 2 was conducted by A. Khoo, A. K. Liau, K. M. Lim, and D. A. Gentile. Data analyses for Study 1 were conducted by S. Prot, B. C. P. Lam, C. A. Anderson, and E. Swing. Data analyses for Study 2 were conducted by S. Prot, D. A. Gentile, and C. A. Anderson. S. Prot, C. A. Anderson, D. A. Gentile, B. Krahé, A. K. Liau, M. Jelic, and B. C. P. Lam wrote and revised the manuscript.

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Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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Supplemental Material

Additional supporting information may be found at http://pss.sagepub.com/content/by/supplemental-data

Note

1. We use "helping" as synonymous with "prosocial behavior" throughout this article, for simplicity of exposition.

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