

Media Violence and Other Aggression Risk Factors in Seven Nations

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Abstract

Cultural generality versus specificity of media violence effects on aggression was examined in seven countries (Australia, China, Croatia, Germany, Japan, Romania, the United States). Participants reported aggressive behaviors, media use habits, and several other known risk and protective factors for aggression. Across nations, exposure to violent screen media was positively associated with aggression. This effect was partially mediated by aggressive cognitions and empathy. The media violence effect on aggression remained significant even after statistically controlling a number of relevant risk and protective factors (e.g., abusive parenting, peer delinquency), and was similar in magnitude to effects of other risk factors. In support of the cumulative risk model, joint effects of different risk factors on aggressive behavior in each culture were larger than effects of any individual risk factor.

Keywords

mass media, aggression, culture/ethnicity

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Children, adolescents, and adults in modern countries consume heavy doses of violent media (Comstock & Scharrer, 2007; Gentile, 2003; Gentile, Saleem, & Anderson, 2007; Kirsh, 2012; Shibuya & Sakamoto, 2003; Singer & Singer, 2012). For example, U.S. children spend an average of 7 hr a day using entertainment media (Rideout, Foehr, & Roberts, 2010), much of which contains violent content (National Television Violence Study, 1996, 1997, 1998; Thompson, Tepichin, & Haninger, 2006).

Six decades of research on media violence effects reveals that exposure to media violence increases the likelihood of aggression in real life (Anderson et al., 2003; Bushman & Huesmann, 2010). In the short term, media violence exposure increases aggressive behavior by priming aggressive cognitions, increasing aggressive affect and physiological arousal, and imitation. In the long term, exposure to media violence increases aggression through several learning processes that produce cognitive and affective changes, including the development and automatization of aggression-related scripts and schemas, emotional conditioning, and desensitization to violence (Groves & Anderson, 2015). These effects have been shown for a variety of different media, including television (Huesmann, Moise-Titus, Podolski, & Eron,

2003), movies (Donnerstein & Berkowitz, 1981), video games (Anderson et al., 2010), music lyrics (Brummert-Lennings & Warburton, 2011; Fischer & Greitemeyer, 2006), and even comic books (Kirsh & Olczak, 2002).

Are Media Violence Effects Culturally Specific or General?

Significant differences in the frequency and patterns of aggression across cultures have been demonstrated for a

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range of specific aggressive behaviors, such as bullying (Smith et al., 1999), peer-directed violence (Bergeron & Schneider, 2005), intimate partner violence (Archer, 2006; Vandello & Cohen, 2003), and homicide (Brown, Osterman, & Barnes, 2009). These differences appear to be related to cultural differences in a host of values, such as collectivism, egalitarianism, moral discipline, and honor.

Important cultural differences also exist in media content and patterns of media violence use (Huesmann & Eron, 1986; Huesmann, Lagerspetz, & Eron, 1984; Kodaira, 1998). For example, marked differences have been shown in the way that violence is portrayed in television shows in Japan and the United States (Kodaira, 1998; Sado & Suzuki, 2007; Suzuki, Sado, Sakamoto, Isshiki, & Hattori, 2004). Television shows in Japan (relative to the United States) tend to depict violence more realistically, highlight the suffering of the victims more frequently, and portray violent perpetrators as heroes less frequently.

That cultural differences exist both in average levels of aggression and in media violence exposure may suggest that culture might moderate the effects of media violence exposure on aggression. However, differences in levels of the predictor and outcome variables across cultures do not necessarily mean that the underlying relationship between the two target variables is different. For example, Anderson (1999) examined relations between attributional style, depression, and loneliness among students from China and the United States. Chinese students were found to have relatively more maladaptive attributional styles as well as higher average depression and loneliness scores than U.S. students. However, in spite of these mean-level differences, the relations of attributional style with depression and with loneliness (i.e., slopes) were highly similar across cultures. This reflects the distinction between level-oriented and structure-oriented cultural differences (Chen, Chan, Bond, & Stewart, 2006; van de Vijver & Leung, 1997). Two cultures may differ in levels of the predictor and outcome, even as the association between predictor and outcome remains the same.

Different theoretical predictions can be made concerning the generality of media violence effects across cultures. Aggression is often viewed as a universal phenomenon, present in all societies and rooted in the same social-cognitive mechanisms (Anderson & Bushman, 2002b; DeWall & Anderson, 2011; Lonner, 1980). Contemporary theories of aggression, such as the General Aggression Model (GAM; Anderson & Bushman, 2002a; DeWall, & Anderson, 2011), tend to posit that, although significant differences exist in mean levels of aggression across cultures, the underlying structure of aggression and its relations with key risk factors (including media violence) should be at least similar in magnitude across cultures. The main reason is that basic cognitive, affective, social learning, and behavioral decision processes are seen as the same in all humans. Findings from several media

violence studies support this view (Anderson et al., 2008, Anderson et al., 2010; Granzberg & Steinbring, 1980; Murray & Kippax, 1977; Williams, 1979).

On the contrary, the Culture \times Person \times Situation approach (CuPS; Cohen & Leung, 2011; Leung & Cohen, 2011) proposes that a specific stimulus or situation may hold a very different meaning in different cultural systems and, as a result, culture may moderate the relations found between predictor and outcome variables. For example, an insult may beget a physically aggressive response in one culture but not in another. For instance, early research found a substantially lower level of exposure to televised violence and less consistent effects of televised violence on aggression among children from Finland than their counterparts from the United States (Huesmann & Eron, 1986; Huesmann et al., 1984). Similarly, cultures differ in the extent to which a given type of behavior (e.g., physical aggression) is constrained by social norms and values; cultures that constrain aggression might therefore yield a weaker media violence effect on aggression than those that have less powerful constraints. Similarly, cultures or countries that currently experience high levels of other aggression risk factors, such as war, poverty, or economic displacement, might yield relatively smaller media violence effects than countries in which fewer citizens experience major aggression risk factors. Indeed, basic theoretical models of human aggression, (including GAM) are sensitive to cultural differences, and could account for different patterns of relationships across cultures.

Further complicating cross-national comparisons are the usual problems of measure equivalence. Does a measure of physical aggression developed in one country mean the same thing when translated to a different language and administered to participants in another?

Occasionally, there is some evidence that media violence effects on aggression might differ across cultures. However, previous cross-cultural studies are limited in several ways that hinder clear comparisons of media violence effects across cultures. For example, the small effect of Eastern versus Western culture found in the Anderson et al. (2010) meta-analysis of violent video game effects was confounded with measurement differences, making it unclear whether that effect is best attributed to culture or to measurement differences. This is oftentimes a problem with meta-analytic examination of moderation effects, in which studies that differ on a hypothesized moderator variable (e.g., country of origin of the participants) also differ in the specific methods or measures used. Moreover, some existing studies of cross-cultural differences were limited to comparison of two cultures that may not differ greatly regarding their cultural norms and values. In the present research, we examined the media violence hypothesis across seven diverse countries. We used the same measures in each country, and tested for measurement equivalence to ensure that the measures carried similar meaning across cultural contexts.

Are Mechanisms Through Which Media Violence Affects Aggression Culturally Specific or General?

A second key question concerns the processes that underlie media violence effects across cultures. The GAM (and other social-cognitive models) proposes that one way in which long-term media violence consumption increases aggression is that media violence exposure leads to the development, automatization, and reinforcement of aggression-related knowledge structures which, in turn, lead to increased aggressive behavior (DeWall & Anderson, 2011). In support of this view, several studies point to aggressive cognitions as a key mediator of long-term media violence effects on aggression (Anderson et al., 2004; Anderson, Gentile, & Buckley, 2007; Gentile, Li, Khoo, Prot, & Anderson, 2014; Möller & Krahé, 2009). Furthermore, recent longitudinal findings suggest that changes in aggressive cognitions are a stronger long-term mediator of media violence effects than are changes in affective functioning (such as decreased empathy; Gentile et al., 2014). Meta-analytic findings by Anderson et al. (2010) suggest that media violence effects on aggressive cognitions are similar in Eastern and Western cultures. However, no cross-cultural studies have directly tested the effects of cognitive (e.g., aggressive cognitions) and affective (e.g., empathy) mediators across cultures.

Risk and Resilience: Media Violence Effects in the Context of Other Risk Factors for Aggression

A third key question concerns media violence effects in the context of other known risk factors for aggressive behavior. Research within the risk and resilience framework highlights the importance of examining media violence effects within the context of other risk factors for aggression. Aggressive behavior is complex, and no single factor can be used to predict it accurately (Anderson & Huesmann, 2003; Dodge & Pettit, 2003; Gentile & Bushman, 2012). Rather than examining each potential risk and protective factor in isolation, a more fruitful approach is to consider a wide range of such factors together. The cumulative risk model proposes that the likelihood of problematic functioning is increased by every risk factor present (reflecting additive or interactive effects; Masten, 2001). Furthermore, this cumulative risk process is expected to have a greater role in disrupting healthy functioning than any single risk factor (Belsky & Fearon, 2002; Gentile & Sesma, 2003). Past studies of media violence effects within a risk and resilience framework support these predictions. For example, Gentile and Bushman (2012) examined the role of six risk and protective factors in predicting aggressive behavior over a 6-month period. Each risk factor at Time 1 (including violent media use) predicted an increased risk of aggression at Time 2, whereas each protective factor decreased it. A cumulative effect was also

found—the combination of risk factors was a better predictor of aggression than any single variable (see also Anderson et al., 2007, Study 3).

A focus on cumulative risk may help clarify the role that media violence plays in the context of other risk and protective factors of aggression, and help resolve current debates about violent media effects. Most media violence research shows small to moderate effect sizes, prompting critics to question whether these effects are large enough to be considered important. In contrast, research from the risk and resilience framework demonstrates that media violence effects are similar to those of other risk factors for aggression (such as physical victimization and hostile attributions), deserving neither special attention nor dismissal (Anderson, DeLisi, & Groves, 2013; Anderson et al., 2007; Gentile & Bushman, 2012). Unfortunately, only a small number of studies in the media violence literature have examined cumulative risk, whereas the majority of work in this area has focused on examining contributions from single risk factors. This has been the case even when multiple risk and protective factors have been measured; in such cases, these other factors tend to be statistically controlled and treated as nuisance variables (e.g., Boxer, Huesmann, Bushman, O'Brien, & Mocerri, 2009; DeLisi, Vaughn, Gentile, Anderson, & Shook, 2013; Ybarra, Mitchell, Hamburger, Diener-West, & Leaf, 2011). More importantly, no studies have examined cross-cultural similarities and differences in media violence effects in the context of other risk and protective factors for aggression.

Goals of the Current Study

In sum, both cultural specificity and generality predictions are reasonable in the media violence domain, on both theoretical and empirical grounds. Extant studies are sparse and mixed. It is unclear whether occasional findings of cultural differences in media violence effects are a product of differences in content of violent media across cultures (a type of artifact), different measures, measures that have different meanings in different countries, or true differences in media violence effects. Furthermore, direct empirical tests of whether hypothesized mechanisms of long-term media violence effects on aggression generalize across cultures are lacking. Finally, no studies have examined the generalizability of media violence effects across very different cultures in the context of other risk and protective factors for aggression.

To address these gaps in the literature, a large-sample, cross-cultural survey study was conducted. Relations between violent media use and aggressive behavior were explored in samples of adolescents and young adults from seven countries (Australia, China, Croatia, Germany, Japan, Romania, and the United States). These countries were sampled from Western, Eastern European, and East Asian cultures that differ markedly in terms of geographic location, cultural values and practices (e.g., Hofstede, Hofstede, & Minkov, 2010).

The main goal of this study was to provide a direct empirical test of whether media violence effects on aggression vary across these seven countries. We hypothesized that media violence exposure would be positively associated with aggressive behavior in different cultures. We also hypothesized that this effect would be of roughly equal magnitude across cultures, but recognized that GAM (and other social-cognitive models) can easily accommodate moderation effects by contextual factors. Therefore, we were open to the alternative hypothesis of substantial variation in effect sizes across cultures. Second, we explored mechanisms through which media violence affects aggression, primarily to assess the extent to which such mediation effects generalize. Based on recent findings by several research teams (e.g., Gentile et al., 2014; Möller, & Krahé, 2009), we hypothesized that media violence exposure would be associated with heightened aggression, primarily through its influence on aggressive cognitions, and relatively less so through affective components such as empathy. Third, we used the risk and resilience framework to explore media violence effects in the context of other key risk and protective factors for aggression. These other factors included participant's sex, abusive parenting, living in a violent neighborhood, being bullied, and association with delinquent peers. We hypothesized that the media violence effect would be significant even when other risk factors were in the model, and that it would be of roughly the same magnitude as other risk factors. Based on the cumulative risk model, we also hypothesized that the combination of risk factors would yield better prediction of aggressive behavior than any of the individual risk factors.

Method

Participants and Procedure

Samples were obtained from 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). Forty-eight participants did not give any responses to the major variables, and hence were removed from data analysis. The final sample of 2,154 adolescents and young adults was 38% male with a mean age of 21 years, $SD = 4.98$. Sample characteristics in each nation are shown in Table 1.

Volunteer participants were invited to complete a questionnaire about their media habits. Questionnaires were administered online or in face-to-face interviews by trained research assistants, based on what was deemed appropriate by each research team.

Measures

Measures were translated and back-translated by competent bilinguals into the official language for each country if an existing version was not available.

Table 1. Sample Characteristics.

	n	Age, M (SD)	% male
1. Australia	380	24.71 (9.52)	35.5
2. China	203	20.50 (1.86)	41.6
3. Croatia	438	20.56 (1.86)	68.1
4. Germany	200	22.49 (3.87)	23.5
5. Japan	395	19.66 (1.46)	24.1
6. Romania	233	16.65 (0.89)	32.6
7. The United States	305	19.37 (1.77)	27.5
Total	2,154	20.72 (4.98)	38.1

Media violence use and total screen time. A modified version of the General Media Habits Questionnaire was used in the current study (Anderson & Dill, 2000; Gentile, Lynch, Linder, Ruh, & Walsh, 2004). Participants named three of their most frequently watched or played television shows, movies, and video games, and rated the frequency of use for each title (total of nine items rated on a 5-point scale from 1 = *watched/played once a month or less* to 5 = *watched/played 5 or more times a week*). For TV shows and movies, they rated "How often do characters try to physically injure each other" on a 7-point scale that ranged from 1 = *never* to 7 = *all the time*. For video games, they rated "How often do you try to physically injure players in the game" on a 7-point scale that ranged from 1 = *never* to 7 = *all the time*. Violent media use was calculated by multiplying the amount of violent content by the frequency of viewing for each title and summing each product. Total screen time was calculated by summing the frequency of use items. Such self-ratings of violent media content have been shown to correlate highly with expert ratings ($r = .75$; Gentile et al., 2009), and are valid indicators (e.g., Busching et al., 2015).

Aggressive behavior. We used a 21-item self-report measure modeled on the Buss and Perry Aggression Questionnaire (BPAQ; Buss & Perry, 1992) to assess aggressive behavior. Items from the original BPAQ were directly adapted to measure physical aggression (eight items, for example, "If somebody hits me, I hit back") and verbal aggression (five items, for example, "I can't help getting into arguments when people disagree with me"). In addition, eight new items based on work in Japan (Hata, 1990; Suzuki, Sado, Hasegawa, Horiuchi, & Sakamoto, 2009; Suzuki, Sado, Horiuchi, Hasegawa, & Sakamoto, 2009a, 2009b) were added to measure relational aggression (e.g., "I sometimes spread rumors that may hurt someone"). Participants rated the items on a scale from 1 (*extremely uncharacteristic of me*) to 7 (*extremely characteristic of me*). The validity of the BPAQ has been supported by significant correlations with laboratory and real-life measures of aggressive behavior (Bushman & Wells, 1998; Buss & Perry, 1992). Our new aggressive behavior questionnaire had adequate reliability (average $\alpha = .86$) and a clear factor structure that generalized across cultures (see the supplemental materials).

Aggressive cognitions. A 12-item scale assessed normative beliefs about aggression, an important type of aggressive cognition (based on Huesmann & Guerra, 1997; Suzuki, Sado, Horiuchi, Hasegawa, & Sakamoto, 2009a, 2009b). Participants rated the acceptability of a range of aggressive behaviors (e.g., “Mary threw something at the person who did mean things to her,” “John shouted back at the person who shouted at him first”). Items were rated on a scale from 1 (*not wrong at all*) to 4 (*very wrong*). This measure was internally consistent across cultures (average $\alpha = .82$).

Empathy. We used the Empathic Concern and Perspective Taking subscales from the Interpersonal Reactivity Index (Davis, 1980, 1983; 14 items) to assess trait empathy. An example item is “When I see someone being taken advantage of, I feel kind of protective toward them.” Items were rated on a 5-point scale from 1 (*does not describe me well*) to 5 (*describes me very well*). The measure was sufficiently reliable across samples (average $\alpha = .76$).

Risk factors for aggression. A new eight-item scale was developed based on risk factors for youth aggression and violence reviewed in Satcher (2001). We measured exposure to four key risk factors with two items each: abusive parenting, living in a violent neighborhood, being bullied, and association with delinquent peers. Example items are “One of your parents or step-parents slapped you” and “You heard guns being shot in your neighborhood.” Participants rated each item on a scale from 1 (*never*) to 5 (*seven or more times*). Alphas for these two item scales ranged from low (.48 for violent neighborhood) to good (.74 for abusive parenting).

Results

Preliminary Analyses

Descriptive statistics and reliability indices for the main measures are shown in Table 2. Zero-order correlations between measures in the combined sample are shown in Table 3.¹

Main Analyses

Statistical analyses are organized into two main parts, one focusing on the media violence effect on aggression across cultures and the other focusing on the media violence effect in the context of other risk and protective factors. Within the first part, we present analyses examining measurement equivalence, tests of cultural equality of media violence effects on aggression, and the direct and indirect effects of media violence through aggressive cognitions and empathy.

Media violence relations with aggression across cultures

Measurement equivalence. We first tested the measurement equivalence of the key measures (aggressive behavior, aggressive cognitions, and empathy) across our samples of

countries. A series of multigroup confirmatory factor analyses were conducted using Mplus 7 (Muthén & Muthén, 2012). Item parcels were formed for each factor by randomly averaging the corresponding items (three parcels per factor; see supplemental materials for additional discussion regarding the use of parcels).² Missing data were treated using full-information maximum-likelihood estimation. Given the large sample size, differences in comparative fit index (CFI) were used to test for invariance of nested models instead of chi-square difference tests (Cheung & Rensvold, 2002). Differences in the CFI of an absolute value less than .01 indicate invariance of two nested models.

An unconstrained measurement model of aggressive behavior, aggressive cognitions, and empathy across the seven nations showed adequate fit ($\chi^2 = 380.30$, $df = 168$, $p < .001$; CFI = .97; Tucker–Lewis index [TLI] = .96; root mean square error of approximation [RMSEA] = .07, 90% confidence interval [CI] = [.06, 0.07]). We then constrained loadings of the parcels to be equal across the seven nations to examine metric equivalence ($\chi^2 = 457.25$, $df = 204$, $p < .001$; CFI = .97; TLI = .96; RMSEA = .06, 90% CI = [.06, .07]). The unconstrained and constrained models showed a CFI difference of .006, indicating that the two nested models did not show a significant difference in model fit.

We also examined scalar equivalence by constraining intercepts to be equal across the seven nations; full scalar equivalence was not achieved ($\Delta CFI = .114$). However, we observed partial scalar equivalence after relaxing four constraints (one for aggression, one for empathy, and two for cognition) on intercepts, as suggested by a CFI difference of .009 comparing the unconstrained and partially constrained models. The final model also showed adequate fit ($\chi^2 = 527.68$, $df = 210$, $p < .001$; CFI = .96; TLI = .95; RMSEA = .07, 90% CI = [.06, .08]). In sum, our measures demonstrated partial measurement equivalence across the seven nations. Although partial measurement equivalence is adequate for comparing correlations and means across cultural groups, the exploratory nature of our measurement models using modification indices requires cross-validation in future research (Byrne, Shavelson, & Muthén, 1989; see supplemental materials for additional item-level analyses of measurement and scalar equivalence).

In sum, the results demonstrated that we can meaningfully compare associations and means involving these measures. Therefore, in all subsequent analyses, aggressive behavior, aggressive cognition, and empathy were treated as latent variables.

Media violence relations³. Next, we tested the hypothesis that media violence exposure will be positively associated with aggressive behavior across cultures. A multigroup structural equation model was run across the seven nations that included aggressive behavior as the outcome and media violence exposure as the main predictor of interest. The unrestricted model fit the data well ($\chi^2 = 50.51$, $df = 26$, $p < .01$;

Table 2. Means, Standard Deviations, and Reliabilities for the Main Measures of Interest.

Variable	Items	Scale range	Australia		China		Croatia		Germany		Japan		Romania		The United States		M α
			M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)			
1. Aggressive behavior	13	1-7	2.93 (0.87)	3.50 (0.89)	3.19 (0.84)	2.67 (0.54)	2.86 (0.79)	3.16 (0.98)	2.77 (0.82)	2.77 (0.82)	2.86 (0.79)	3.16 (0.98)	2.77 (0.82)	2.77 (0.82)	2.77 (0.82)	2.77 (0.82)	.86
2. Aggressive cognitions	12	1-4	1.93 (0.44)	2.35 (0.40)	2.09 (0.50)	2.01 (0.38)	1.94 (0.38)	2.04 (0.62)	1.95 (0.48)	1.95 (0.48)	1.94 (0.38)	2.04 (0.62)	1.95 (0.48)	1.95 (0.48)	1.95 (0.48)	1.95 (0.48)	.82
3. Empathy	14	1-5	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)	3.63 (0.58)	3.46 (0.43)	3.42 (0.59)	3.63 (0.58)	3.63 (0.58)	3.63 (0.58)	3.63 (0.58)	.76
4. Violent media use	9	1-250	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)	70.40 (44.55)	58.80 (31.70)	43.84 (28.13)	70.40 (44.55)	70.40 (44.55)	70.40 (44.55)	70.40 (44.55)	.74
5. Abusive parenting	2	1-5	2.20 (1.21)	2.28 (1.23)	2.21 (1.16)	—	2.44 (1.32)	1.71 (0.98)	1.50 (0.89)	1.50 (0.89)	2.44 (1.32)	1.71 (0.98)	1.50 (0.89)	1.50 (0.89)	1.50 (0.89)	1.50 (0.89)	.74
6. Peer victimization	2	1-5	2.79 (1.13)	2.29 (1.03)	1.60 (0.89)	—	3.04 (1.28)	2.09 (1.05)	2.42 (0.99)	2.42 (0.99)	3.04 (1.28)	2.09 (1.05)	2.42 (0.99)	2.42 (0.99)	2.42 (0.99)	2.42 (0.99)	.69
7. Peer delinquency	2	1-5	2.32 (1.05)	1.85 (0.80)	2.74 (1.21)	—	2.45 (0.87)	1.84 (0.79)	2.18 (1.03)	2.18 (1.03)	2.45 (0.87)	1.84 (0.79)	2.18 (1.03)	2.18 (1.03)	2.18 (1.03)	2.18 (1.03)	.50
8. Violent neighborhood	2	1-5	1.68 (0.77)	1.18 (0.42)	1.77 (1)	—	1.13 (0.380)	1.30 (0.65)	1.68 (0.73)	1.68 (0.73)	1.13 (0.380)	1.30 (0.65)	1.68 (0.73)	1.68 (0.73)	1.68 (0.73)	1.68 (0.73)	.48

Table 3. Bivariate Correlations Between Main Measures.

	1	2	3	4	5	6	7	8	9
1. Aggressive behavior	—								
2. Aggressive cognitions	.38**	—							
3. Empathy	-.17**	.27**	—						
4. Violent media use	.21**	.13**	-.11**	—					
5. Abusive parenting	.19**	.06*	-.02	.07**	—				
6. Peer victimization	.18**	.08**	.10**	.29**	.31**	—			
7. Peer delinquency	.27**	.14**	-.03	.19**	.27**	.29**	—		
8. Violent neighborhood	.19**	.12**	.02	.19**	.13**	.09**	.45**	—	
9. Sex	.25**	.25**	-.19**	.30**	.08**	.11**	.23**	.23**	—

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4. Standardized and Unstandardized Effects of Media Violence on Aggression in an Unconstrained Multiple-Group Structural Equation Model Across Seven Nations.

Group	β	B	SE	t
1. Australia	.32	0.006	0.001	5.78***
2. China	.34	0.008	0.002	4.85***
3. Croatia	.26	0.006	0.001	5.19***
4. Germany	.25	0.005	0.001	3.28**
5. Japan	.16	0.003	0.001	3.04**
6. Romania	.34	0.010	0.002	5.04***
7. The United States	.35	0.006	0.001	6.28***

* $p < .05$. ** $p < .01$. *** $p < .001$.

CFI = .99; TLI = .99; RMSEA = .06, 90% CI = [.03, .08]). Media violence was positively and significantly associated with the aggressive behavior latent factor in each nation, as shown in Table 4. Constraining the predictive path of media violence on aggressive behavior to be equal across nations did not result in significant decrease of model fit ($\Delta CFI = .001$), and the constrained model fit the data well ($\chi^2 = 61.89$, $df = 32$, $p < .01$; CFI = .99; TLI = .99; RMSEA = .06, 90% CI = [.04, .08]). Thus, the relation between violent media use and aggression did not significantly differ across cultures. In other words, media violence associations with aggressive behavior appear to be very similar in magnitude across widely varying cultures.⁴

Violent media mechanisms. To examine the mechanisms through which violent media use was related to aggression across the seven nations, aggressive cognition and empathy were tested as potential mediators. Adequate model fit was obtained for the unconstrained model ($\chi^2 = 510.60$, $df = 246$, $p < .001$; CFI = .97; TLI = .96; RMSEA = .06, 90% CI = [.05, .07]). The indirect effects are calculated in the MPlus program by multiplying the mediating path coefficients; standard errors for significance tests are derived using the delta method. Constraining direct and indirect media violence effects on aggression to be equal across the seven nations did not significantly decrease model fit ($\Delta CFI = .005$), thereby suggesting that the mediating processes

are essentially the same. Results from the final constrained model are shown in Figure 1 ($\chi^2 = 575.24$, $df = 276$, $p < .001$; CFI = .96; TLI = .95; RMSEA = .06, 90% CI = [.05, .07]). In particular, across the seven nations the effect of media violence on aggressive behavior was partially mediated by aggressive cognition ($ps < .001$, average standardized indirect effect = .07). The indirect effect through empathy was also significant but considerably smaller than the mediated path through aggressive cognition ($ps < .05$, average standardized indirect effect of .01).

Media violence relations in the context of other risk factors for aggression. We ran a set of analyses examining the association between media violence exposure and aggression in the context of multiple risk and protective factors. Because measures of additional risk factors for aggression were not obtained from the German sample, these analyses were conducted among the remaining six countries.

Five risk factors were added to the basic model with media violence use: participant's sex, abusive parenting, living in a violent neighborhood, peer victimization, and association with delinquent peers. The unconstrained model showed adequate fit ($\chi^2 = 137.68$, $df = 82$, $p < .001$; CFI = .98; TLI = .97; RMSEA = .05, 90% CI = [.03, .06]). Constraining effects of the six predictors on aggressive behavior to be equal across cultures did not significantly reduce model fit ($\Delta CFI < .001$). Results from the final constrained model are shown in Figure 2 ($\chi^2 = 166.48$,

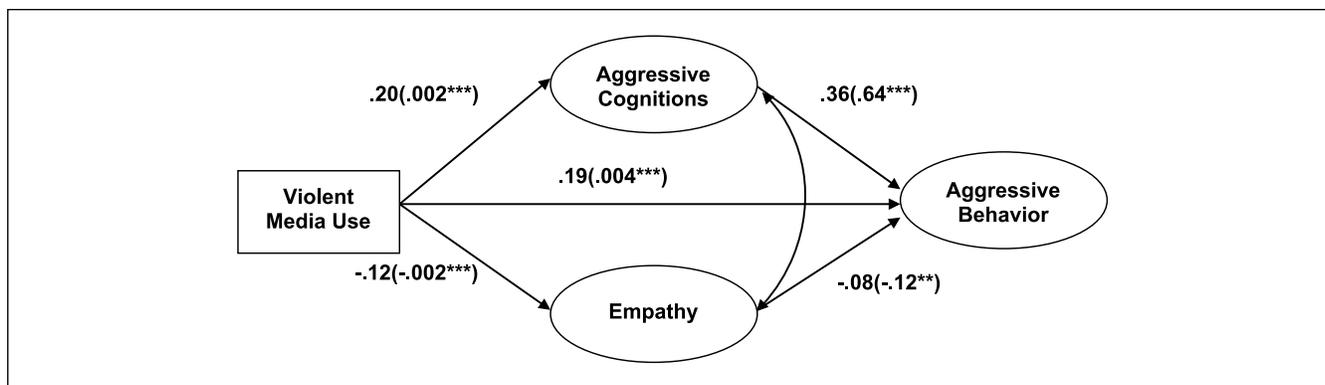


Figure 1. Paths from media violence use to aggressive behavior from a multigroup structural equation model across seven nations. Note. Average standardized effects are shown (unstandardized effects constrained to be equal across seven nations are reported in parentheses). $\chi^2 = 575.24$, $df = 276$, $p < .001$; CFI = .96; TLI = .95; RMSEA = .06, 90% CI = [.05, .07]. CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; CI = confidence interval. * $p < .05$. ** $p < .01$. *** $p < .001$.

$df = 112$, $p < .001$; CFI = .98; TLI = .98; RMSEA = .04, 90% CI = [.03, .05]). Violent media use, being a male, abusive parenting, neighborhood crime, peer victimization, and peer delinquency were significant risk factors associated with greater aggressiveness.

Effect sizes of the various individual risk and protective factors were similar, small to moderate in magnitude (average standardized effects ranging from $\beta = .08$ for sex to $\beta = .17$ for peer delinquency). However, in unison the risk factors predicted a substantial proportion of variance in aggressive behavior (average $R^2 = .19$, $ps < .01$). Adding these five risk factors doubled the variance being explained (i.e., the comparable model without these five risk factors yielded an average R^2 of .08). These results indicate that the effect of any one predictor is unique and cannot be explained by any of the other predictors. Further, they support the cumulative risk model, suggesting that cumulative effects of multiple risk factors are more powerful than effects of single risk factors.

Next, a second approach based on the cumulative risk model was used (Boxer et al., 2009; Sameroff, 2000). The six main risk factors of interest (violent media use, sex, abusive parenting, living in a violent neighborhood, peer victimization, and association with delinquent peers) were recoded dichotomously as present or absent, within the sample for each country, so that participants who scored at or above the 75th percentile on each risk factor got a score of 1 and participants who scored below the 75th percentile got a score of 0 (except that male = 1, female = 0). A series of multigroup structural equation models were run with the overall number of risk factors present as a predictor of aggressive behavior. Based on prior findings by Gentile and Bushman (2012), in addition to a linear component we tested for a curvilinear (quadratic) component in the model.

Preliminary analyses revealed that the quadratic component was not significant in predicting aggressive behavior in

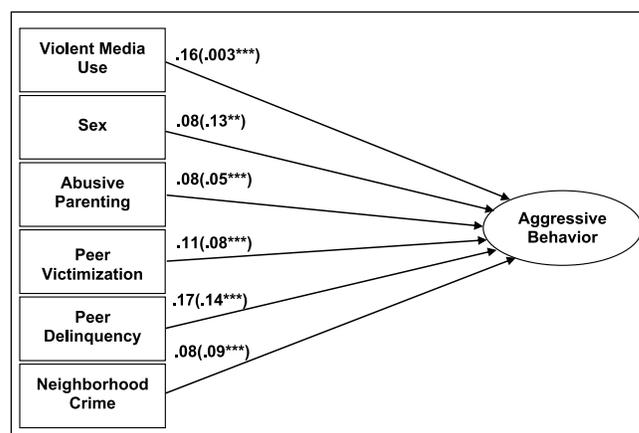


Figure 2. Paths from media violence use and other risk factors to aggressive behavior from a multigroup structural equation model across six nations. Note. Average standardized effects are shown (unstandardized effects constrained to be equal across seven nations are reported in parentheses). Germany excluded because additional risk factors were not measured in that sample. $\chi^2 = 166.48$, $df = 124$, $p < .001$; CFI = .98; TLI = .98; RMSEA = .04, 90% CI = [.03, .05]. CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; CI = confidence interval. * $p < .05$. ** $p < .01$. *** $p < .001$.

any country, so we next ran a model with only the linear component. The unconstrained model showed good fit to the data ($\chi^2 = 43.27$, $df = 22$, $p < .01$; CFI = .99; TLI = .99; RMSEA = .06, 90% CI = [.03, .08]). Constraining the paths of the number of risk factors on aggression to be equal across the six nations did not reduce model fit ($\Delta CFI < .001$), suggesting that the effect sizes were essentially the same across nations. Model fit for the constrained model was $\chi^2 = 47.49$, $df = 27$, $p < .01$; CFI = .99; TLI = .99; RMSEA = .05, 90% CI = [.03, .07]. The linear effect of the number of risk factors on aggressive behavior was significant across the six nations (b

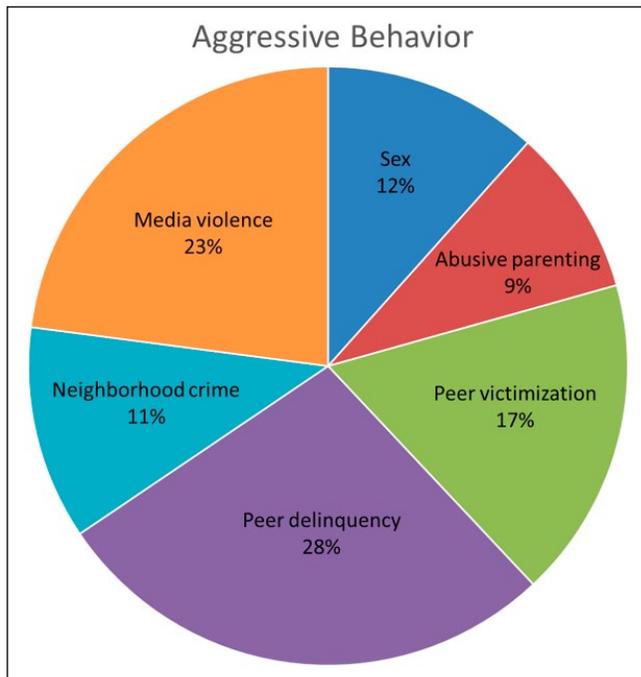


Figure 3. Percentages of variance in aggressive behavior accounted for by six predictors estimated using relative weights analysis.

$= .19, p < .001$, average $\beta = .39$). This finding suggests the existence of a linear, additive relationship between the number of risk factors a person experiences and aggression.

Finally, to further assess the relative effects of the six risk factors, we used Johnson's relative importance index (Johnson & LeBreton, 2004; cf. Gentile & Bushman, 2012), which takes into account both unique and shared variances. As shown in Figure 3, media violence use was the second most important predictor, behind peer delinquency. That is, media violence was a more important predictor than abusive parents, neighborhood violence, sex, and victimization by peers.

Discussion

Main Findings and Implications

The main goal of this study was to examine whether media violence relations with aggression are general across cultures. This is the first cross-cultural study that directly examined the question of cultural generality versus specificity of media violence effects on aggression using the same methods and measures in so many different cultures.

Four key findings emerged: First, violent media use was positively and significantly related to aggressive behavior in all countries. Second, these media violence effects were similar in magnitude across the seven countries. Although these first two findings may *seem* like old news to many media violence scholars, given that media

violence effects have been observed in many countries over the past six decades, in fact the findings are new and important because this is the first study of many different cultures (East Asian, Eastern European, Western European) in which the same measures of media violence exposure and of aggression were used. In short, this study adds considerable weight to the argument that the relationship between media violence and aggression is quite general.

A third key contribution involves the mechanisms through which media violence may influence aggressive behavior. More specifically, results suggest that the mechanisms also are culturally general. Evidence was found that aggressive cognition partially mediates the linkage between media violence consumption and aggression across cultures. These results extend those from prior longitudinal studies (each within a single country) establishing aggressive cognition as a mediator of long-term media violence effects in Western cultures (e.g., Anderson et al., 2007; Gentile et al., 2014; Möller & Krahe, 2009), suggesting that indirect effects of media violence on aggression through aggressive cognitions are similar across cultures. The finding of a considerably smaller empathy partial mediation path also fits well with recent longitudinal results, as well as meta-analytic results (Anderson et al., 2010). More broadly, these findings support a view of aggression as a relatively universal phenomenon that is rooted in the same basic social-cognitive mechanisms, despite cultural influences on levels of aggression (Anderson & Bushman, 2002b; DeWall & Anderson, 2011; Lonner, 1980).

The fourth key contribution—concerning the risk and resilience framework—can be further subdivided into five main findings: First, the media violence effect on aggression remained significant even after controlling for a number of known risk factors for aggression. Thus, arguments that media violence effects are merely the result of confounds, some type of selection effect (i.e., that aggressive people are drawn to violent media and that violent media have no impact) are greatly weakened. Second, the effect sizes of the six risk and resilience variables were similar across cultures, again supporting the idea that basic processes underlying aggression are fairly general. Third, the magnitude of the media violence relation with aggression was as large as other known risk factors that are generally considered by the lay public, policy makers, and most psychological scientists as being major risk factors. Fourth, the examination of cumulative risk revealed that predicting aggression from multiple risk and resilience factors explains more variance, yielding more accurate predictions, than from any single factor. Fifth, there was a significant linear relationship between number of risk factors experienced by an individual and their level of aggressiveness. In sum, the findings strongly suggest that media violence is similar to other known risk factors for aggression, deserving neither special attention nor special denial by researchers, policy makers, therapists, or parent/child advocacy groups.

Strengths and Limitations

This study had several key strengths. The large, cross-cultural sample allowed for direct comparisons of media violence effects across nations, comparisons which are lacking in past studies. Even the best of meta-analyses in this area necessarily suffer from the fact that studies done in different cultures usually use different measures of the key conceptual variables, and thus are difficult to interpret. The seven countries that were sampled in this study vary in terms of geographic location as well as cultural values and practices (e.g., Hofstede et al., 2010) but were assessed with the same measures, which our analyses showed to meet standard criteria for measurement equivalence. Finally, unlike most prior studies, a range of different risk and protective factors were measured simultaneously, so that media violence effects could be compared to them.

Several limitations of this study need to be noted. First, in spite of the wide range of cultures in our sample, most countries that participated in the study have moderate or high levels of economic and technological development. It would be useful to include severely underdeveloped countries in future studies to provide stronger tests of cultural universality; of course, only countries that are sufficiently developed to allow high levels of access to screen media violence can be used. Moreover, including a larger number of countries could increase the power to detect contextual effects (i.e., characteristics of the country that may moderate individual-level effects). One intriguing hypothesis is that people or countries exposed to high levels of many risk factors for aggression might show smaller media effect sizes.

Second, the samples derived from all countries in the present study were young, college- or high school-aged individuals with an average age of 21 years but a range of average ages from 17 (Romania) to 25 (Australia). The representativeness of each country's sample for the entire country could certainly vary from country to country. Generally speaking, the present findings best apply to the age ranges included, but there is little evidence in the literature to indicate that media effects differ dramatically between age groups, despite theoretical reasons to expect such differences (cf. Bushman & Huesmann, 2006).

Third, the present study was cross-sectional, thus making it risky to draw strong causal conclusions. For example, the mediation analyses should not be interpreted as providing strong causal support for the hypothesized roles of aggressive cognitions and empathy as mediators of media violence effects on aggression.⁵ Interestingly, this limitation does not substantially weaken our basic findings and conclusions for at least two reasons: First, past research in the media violence domain has clearly demonstrated and replicated the same media violence effects in longitudinal and experimental contexts (e.g., Anderson & Bushman, 2002a). Second, the predominant modern theories of human aggression all make very specific predictions about the pattern of associations that should be found in cross-sectional data of this type. Testing those

predictions provides an opportunity for falsification, as well as an opportunity to test plausible alternative explanations (Prot & Anderson, 2013). The present data and analyses tested these causal theory-based predictions and strongly supported them, while contradicting several key alternative explanations (e.g., that controlling for other known risk factors would eliminate the media violence and aggression association). Nonetheless, it would be useful to examine cross-cultural generality of media violence effects using experimental and longitudinal methodology in future studies, studies in which the methods and measures are carefully tested to have the same meaning and structure across cultures.

Finally, all measures in the present study were based on self-reports. In future studies, it would be useful to employ multiple measures of media habits and aggression (such as partner or parent or teacher reports and behavioral measures, as in Anderson et al., 2007, Study 3), although numerous past studies show evidence of both internal and external validity of our main measures (e.g., Anderson et al., 2007; Busching et al., 2015; Bushman & Wells, 1998; Gentile et al., 2009).

Conclusion

Do media violence relations with aggression generalize across cultures? The current findings suggest that the answer is "yes." The direct effect of screen media violence exposure (TV, films, video games) on a composite measure of physical, verbal, and relational aggression was statistically significant, of small to moderate size, and was very similar across our seven-country samples. Similarly, the indirect effect of media violence exposure on aggression through aggressive cognitions and empathy was also significant and essentially invariant across cultures.

Do media violence effects remain significant and of an important magnitude when other important risk and resilience factors are included in the analyses? Again, the answer is "yes." Indeed, the media violence effects were among the largest uncovered in this study, even after controlling for sex, abusive parenting, neighborhood violence, peer victimization, and peer delinquency.

Finally, does a risk/resilience model with multiple risk factors yield better prediction of aggression than any single predictor? To the surprise of no one who works in the aggression/violence area, the answer is clearly "yes."

Authors' Note

Authorship order is based on contributions to (a) overall design of study, questionnaires, write-up; (b) data analyses; (c) data gathering in each country; (d) alphabetical. In actuality, it is impossible to assess relative contributions of these scholars; all were essential to this project.

Declaration of Conflicting Interests

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Supplemental Material

The online supplemental material is available at <http://pspb.sagepub.com/supplemental>.

Notes

1. It is important to keep in mind that two correlations may differ even though the two corresponding slopes may be essentially the same. This can happen, for example, if the two samples differ in the *SD* of the predictor variable. Usually, psychological science researchers are primarily interested in differences between slopes. That is, we are interested in whether the amount of change in *y* for each unit change in *x* is the same or different between samples. Our main analyses essentially test the differences in slopes, not correlations.
2. Due to concerns regarding the multidimensionality of the aggression construct (Bandalos, 2002), and the potential for idiosyncratic influence of random parcels, all of the main analyses were replicated using parcels created from the aggression subscales (Physical, Verbal, Relational). All results were similar to the original analyses regardless of the parcels used.
3. We also tested the models with participants' sex being controlled. It yielded similar patterns of result. Given that sex is used as a risk factor in the risk factor model, we present results without this control variable here.
4. We would like to thank a reviewer for noting that individual country comparisons may have gone undetected by these omnibus tests. We therefore conducted a series of individual country comparisons. These analyses did not reveal significant differences between any two countries, regardless of whether covariates were included or whether random (vs. subscale) parcels were used for the aggression measure.
5. Of course, recent work by MacKinnon and Pirlott (2015) on assessing mediation shows a similar weakness in establishing the causal role of a mediating variable even in experimental studies.

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INTERNATIONAL SURVEY OF MEDIA HABITS AND SOCIAL BEHAVIORS

Note: This is the U.S. Version. Some wording and item differences occur for different countries.

Do not begin this survey until you have read all the instructions.

INSTRUCTIONS:

- ◆ This survey contains many items about your experiences with television, movies/videos, and video games. When we ask about video games, we mean any games you play on computer, on video game consoles (such as Nintendo, Playstation or Xbox), on hand-held game devices (such as Sony PSP or Nintendo DS), or in video arcades.
- ◆ This survey also contains a number of questions about your beliefs, life experiences, and typical behaviors. If you are uncomfortable answering any of these questions you may leave them blank, however complete and honest responses very valuable to our research. Your responses will remain anonymous.
- ◆ Please answer each question in order and do not look ahead. Do not skip ahead unless instructed to do so.

1. Are you: Male Female

2. What is your current age? (in years) _____

12. Do you ever play video games? Yes No

I. What are your three most frequently watched television shows?

a. Title #1: _____

13. How often do you watch this show?

- Once a month or less
- 2-3 times a month
- Once a week
- 2-4 times a week
- 5 or more times a week

16. How often do characters try to physically injure each other in this show?

Never: 1 2 3 4 5 6 7 :All the time

b. Title #2: _____

20. How often do you watch this show?

- Once a month or less
- 2-3 times a month
- Once a week
- 2-4 times a week
- 5 or more times a week

23. How often do characters try to physically injure each other in this show?

Never: 1 2 3 4 5 6 7 :All the time

c. Title #3: _____

27. How often do you watch this show?

- Once a month or less
- 2-3 times a month
- Once a week
- 2-4 times a week
- 5 or more times a week

30. How often do characters try to physically injure each other in this show?

Never: 1 2 3 4 5 6 7 :All the time

II. What are your three most frequently watched movies/videos/DVDs?

a. Title #1: _____

34. How many times have you watched this movie?

- Once
- Twice
- Three times
- Four times
- Five or more times

37. How often do characters try to physically injure each other in this movie?

Never: 1 2 3 4 5 6 7 :All the time

b. Title #2: _____

41. How many times have you watched this movie?

- Once
- Twice
- Three times

44. How often do characters try to physically injure each other in this movie?

- Four times
- Five or more times

Never: 1 2 3 4 5 6 7 :All the time

c. Title #3: _____

48. How many times have you watched this movie?

- Once
- Twice
- Three times
- Four times
- Five or more times

51. How often do characters try to physically injure each other in this movie?

Never: 1 2 3 4 5 6 7 :All the time

Instructions: If you have never played video games, skip to question #93. Otherwise, continue with the next question.

III. What are your three most frequently played video games?

a. Title #1: _____

55. How often do you play this game?

- Once a month or less
- 2-3 times a month
- Once a week
- 2-4 times a week
- 5 or more times a week

59. How often do you try to physically injure players in this game?

Never: 1 2 3 4 5 6 7 :All the time

b. Title #2: _____

66. How often do you play this game?

- Once a month or less
- 2-3 times a month
- Once a week
- 2-4 times a week
- 5 or more times a week

70. How often do you try to physically injure players in this game?

Never: 1 2 3 4 5 6 7 :All the time

c. Title #3: _____

77. How often do you play this game?

- Once a month or less
- 2-3 times a month
- Once a week
- 2-4 times a week
- 5 or more times a week

81. How often do you try to physically injure players in this game?

Never: 1 2 3 4 5 6 7 :All the time

BP/H AQ (Buss-Perry/Hata Aggression Questionnaire)

Please rate each of the following items in terms of how characteristic they are of you. Use the following scale for answering these items.

	1	2	3	4	5	6	7	
Extremely Uncharacteristic of Me								Extremely Characteristic of Me

These scales are copyright protected. Here are the references.

- Hata, K. (1990). Construction of an inventory for assessing different modes of hostile aggression. *Japanese Journal of Psychology*, 61, 227-234. [in Japanese]
- Buss, A. H. & Perry, M. (1992). The Aggression Questionnaire. *Journal of Personality & Social Psychology*, 63, 452-459.

IRI (Interpersonal Reactivity Index - Empathy)

The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you by choosing the appropriate number on the scale at the top of the page: 1, 2, 3, 4, or 5. When you have decided on your answer, fill in the number on the bubble sheet next to the item number. **READ EACH ITEM CAREFULLY BEFORE RESPONDING.** Answer as honestly as you can. Thank you.

	1	2	3	4	5	
Does Not Describe Me Well						Describes Me Very Well

This scale is copyright protected. Here are the references.

- Davis, M. H. (1980). A multidimensional approach to individual differences in empathy. *JSAS Catalog of Selected Documents in Psychology*, 10, 85.

Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach.

Journal of Personality and Social Psychology, 44, 113-126.

BRFS (Brief Risk Factor Scale)

Each of the following statements describes things that might have occurred. Indicate how many times each event has occurred in your life.

Never	1-2 Times	3-4 Times	5-6 Times	7 or More Times
1	2	3	4	5

207. One of your parents or step-parents slapped you.

208. One of your parents or step-parents hit you.

209. Other students pushed or hit you.

210. Other students made fun of you.

211. You consumed alcohol when you were not legally permitted to do so.

212. You have used illegal drugs, such as marijuana, cocaine, heroin, LSD, or ecstasy.

213. One of your friends got into fights.

214. One of your friends stole from a store.

215. You heard guns being shot in your neighborhood.

216. You saw someone being arrested.

NBA (Normative Beliefs of Aggression)

For each of the following situations, please rate how wrong John or Mary's behavior is.

1: Not wrong at all

2: A little wrong

3: Wrong

4: Very wrong

This scale is copyright protected. Here is the reference.

Huesmann, L. R., & Guerra, N. G. (1997). Children's normative beliefs about aggression and aggressive behavior.

Journal of Personality and Social Psychology, 72, 408-419.

Supplemental Materials:

Additional Factor Structure and Measurement Invariance Analyses

We conducted Principal Component Analysis (PCA) with promax rotation to explore the factor structure underlying our aggression behavior measure. Following the meta-analytic factor analysis procedure (Becker, 1996; see Leung et al., 2002; Lam et al., 2016 for similar use), we pooled the correlation matrices of the items from each country before conducting PCA. This procedure weights each sample equally despite different sample sizes and prevents mean differences of items across samples to influence the factor structure obtained.

Our results revealed that four factors had eigenvalues higher than 1 and we explored two- to four-factor solutions based on a scree test. A three-factor solution showed a clearly interpretable solution and factor loadings, which explained 44.99% of the total variance. The three factors confirmed our prediction and they were physical aggression (8 items), verbal aggression (5 items) and relational aggression (8 items). Two items showed double loadings onto a second factor. These items were retained, however, to allow the findings of the current work to retain comparability to other work using this popular measure. Factor loadings for the aggressive behavior measure are summarized in Table 1.

Table 1
Factor Loadings of Aggressive Behavior Measure

	Physical	Verbal	Relational
1. Given enough provocation, I may hit another person.	0.81	0.01	-0.03
2. Once in a while I can't control the urge to strike another person.	0.73	-0.08	0.02
3. There are people who pushed me so far that we came to blows.	0.72	0.00	-0.02
4. If I have to resort to violence to protect my rights, I will.	0.71	0.10	-0.07
5. I get into fights a little more than the average person.	0.70	-0.07	-0.02
6. If somebody hits me, I hit back.	0.62	0.21	-0.05
7. I have threatened people I know.	0.49	0.13	0.10
8. I can think of no good reason for ever hitting a person.	0.44	-0.12	-0.11
9. I tell my friends openly when I disagree with them.	-0.13	0.83	-0.18
10. I often find myself disagreeing with people.	-0.01	0.72	0.03
11. When people annoy me, I may tell them what I think of them.	0.02	0.72	0.01
12. I can't help getting into arguments when people disagree with me.	0.05	0.65	0.13
13. My friends say that I'm somewhat argumentative.	0.10	0.55	0.16
14. When a person I don't like asks me questions, I sometimes make vague responses on purpose.	-0.11	0.03	0.78
15. I ignore people that I do not get along with.	-0.11	0.00	0.73
16. When a person I hate talks to me, I sometimes act like I cannot hear that person.	-0.04	-0.07	0.72

17. When an arrogant person asks me to do something, I do the opposite of the request.	0.09	-0.02	0.65
18. When I am bothered by someone, I tell someone else about it.	-0.15	0.15	0.51
19. When people pretend to know everything, I bother them by asking too many questions.	0.05	0.17	0.49
20. I sometimes spread rumors that may hurt someone. ^a	0.31	-0.16	0.40
21. I sometimes hide my friends' belongings to trouble them. ^a	0.28	-0.12	0.37

Note. Loadings larger than .40 are bolded.

^aItems that showed double-loadings.

Next, we conducted a confirmatory factor analysis (CFA) in order to confirm the factor structure. The baseline model produced marginal fit ($\chi^2 = 2729.08$, $df = 924$, $RMSEA = 0.08$, $90\% CI = 0.08 - 0.08$, $TLI = 0.83$, $CFI = 0.85$). Model fit improvements were made by removing item 7 (Table 1) and adding residual covariance parameters based on modification indices ($\chi^2 = 1874.55$, $df = 791$, $RMSEA = 0.07$, $90\% CI = 0.06 - 0.07$, $TLI = 0.88$, $CFI = 0.90$). Next, the factor loadings were constrained to be equal across groups, producing a significant reduction in model fit ($\Delta CFI = .015$). As a result, item 3, item 5, and item 7 were allowed to vary in a subsequent model, which produced a partially metric equivalent model ($\Delta CFI = .008$).

We further constrained intercepts to be equal across groups, producing a significant reduction in model fit ($\Delta CFI = .099$). After removing the constraints on the intercepts of 11 items (items 1, 4, 5, 6, 11, 12, 13, 14, 16, 18, 19), we obtained a partially scalar equivalent model ($\Delta CFI = .009$).

For the current research questions, our interests largely focus on participants' general aggressiveness and hence an additional hierarchical model was conducted in which the aggression subcomponents (physical, verbal, and relational aggression) were summed and used to create a latent aggression measure (Figure 1).

In order to ensure that these factors were stable across cultures and loaded onto a general aggressiveness factor, additional confirmatory factor analyses were conducted in which the items for each subscale were averaged and used to form a general aggressiveness latent variable for each country. The loadings for these subscales were then constrained across all countries. Figure 1 shows this measurement model.

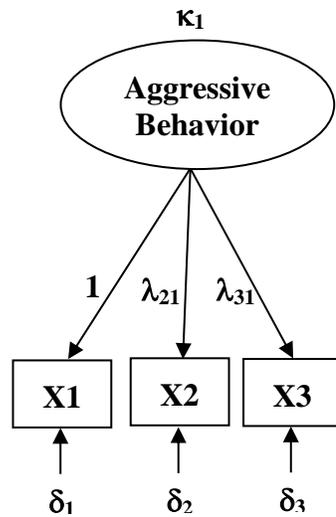


Figure 1. *Measurement model of aggressive behavior.*

The model, despite the constraints, produced a good index of fit, $\chi^2 = 27.27$, $df = 12$, $RMSEA = 0.07$, $90\% \text{ CI} = 0.03 - 0.10$, $TLI = 0.97$, $CFI = 0.98$, suggesting that a stable general aggressiveness factor is present across cultures. The decision to use item parcels in all subsequent analyses was made because they reflect this more general construct while simplifying the model. This approach also benefits the model with improvements in reliability, normality, and reductions in idiosyncratic item influence (Meade & Kroustalis, 2005).