

# Attitudes Toward Violence Scale: Psychometric Properties With a High School Sample

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## Abstract

Youth violence represents a serious problem affecting individuals, communities, and the larger society. Greater efforts aimed at the eradication of youth violence are necessary, and work in this field could be enhanced by psychometrically strong measures. The present study examined the factor structure of the Attitudes Toward Violence Scale (ATV) using exploratory factor analysis (EFA) with a sample of 359 high school students. A three-factor structure was identified. The three factors were invariant across sex, however, males obtained significantly higher scores on the three ATV factors and on the ATV total score showing generally moderate effect sizes. Directions for future research with the ATV are discussed.

## Keywords

attitudes toward violence scale, factor analysis, factorial invariance, sex differences

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## *Youth Violence*

Youth violence is a challenging societal problem that affects individuals as well as communities at large. The Centers for Disease Control and Prevention encourage the use of a standard definition for such interpersonal violence perpetrated by youth and utilizes that offered by the World Health Organization: “the intentional use of physical force or power, threatened or actual, against another person or against a group or community that results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation” (Dahlberg & Krug, 2002, p. 5). Thus, youth violence includes violence between peers, between dating partners, and among groups. Youth violence between peers and groups is the second leading cause of death among young people in the U. S. (CDC, 2010a). As well, youth violence between peers and groups is more prevalent among males than females (CDC, 2010b). Teen dating violence, a component of youth violence, occurs between individuals in an intimate relationship, and can be emotional, physical, or sexual in nature (CDC, 2010c). Although prevalence estimates of adolescent dating violence in the U.S. vary widely, they have been shown to range from 10% to 46% (CDC, 2010b; Hickman, Jaycox, & Aranoff, 2004; O’Leary, Smith Slep, Avery-Leaf, & Cascardi, 2008; Silverman, Raj, Mucci, & Hathaway, 2001).

## *Attitudes and Risk Factors Regarding Violence*

Bandura’s (1977) social learning theory is a useful model to understand attitude development. Social learning theory posits that learning occurs within a social context such that individuals utilize observational learning, imitation, and modeling. Additionally, social learning theory emphasizes cognition, affect, and behavior. In regard to violence, social learning theory can be used to understand the ways in which exposure to violence connects to attitude development. Bandura (1977) articulated that emotional responses and beliefs are learned through both direct experience and observation; thus, attitudes can take shape from personally experiencing violence as well as from witnessing violence. For example, direct victimization, witnessing violence in person, and watching violence in media (e.g., video games, news reports, movies, television) can be significant factors to subsequent development of attitudes toward violence (Guttman, Mowder, & Yasik, 2006). Moreover, experiencing and/or witnessing violence may be internalized as acceptable methods to resolving conflict and managing negative emotions, resulting in aggressive social scripts and proviolence attitudes (Guttman

et al., 2006). Thus, individuals can model their aggressors' approval of violence as well as vicariously acquire proviolence attitudes by way of witnessing others' victimization (Slovak, Carlson, & Helm, 2007). Regarding the association between attitudes and behavior, previous research has shown that unhealthy, proviolence attitudes are a critical risk factor connected to aggressive behavior (Department of Health and Human Services [DHHS], 2001; Franchina, Eisler, & Moore, 2001; Guttman et al., 2006; Hawkins et al., 2000; Vernberg, Jacobs, & Hershberger, 1999).

*Risk factors and attitude development.* A number of risk factors for perpetration of youth violence have been identified in the literature. These include a violent victimization history (Hawkins et al., 2000; Resnick, Ireland, & Borowsky, 2004), antisocial beliefs and attitudes (DHHS, 2001; Hawkins et al., 2000), exposure to violence and conflict in the family and in the community (DHHS, 2001; Hawkins et al., 2000; Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009), parents' authoritarian childrearing attitudes (Chaffin, 2006; DHHS, 2001), and harsh, lax, or inconsistent disciplinary practices (Chaffin, 2006; DHHS, 2001). Also, some research has demonstrated deleterious effects of television and media violence including depictions of war violence and terrorism, and video game violence on the emergence of youth violence perpetration (Aber, Gershoff, Ware, & Kotler, 2004; Anderson, 2004; Anderson et al., 2008; Huesmann, 2007; Nader, 2010; Pfefferbaum, Gurwitch, Robertson, Brandt, & Pfefferbaum, 2003; Wang et al., 2006). Finally, risk factors for dating violence perpetration include sexist and stereotypical attitudes regarding abusive dating behavior (Franchina, Eisler, & Moore, 2001), childhood maltreatment (Gratz, Paulson, Jakupcak, & Tull, 2009; Henderson, Bartholomew, Trinke, & Kwong, 2005; Wolfe, Wekerle, Scott, Straatman, & Grasley, 2004), and witnessing partner violence in the home (Capaldi & Clark, 1998; Ehrensaft et al., 2003).

In light of social learning theory, children and adolescents experiencing and/or observing violence in the home and/or the community may be primed to develop unhealthy attitudes toward interpersonal violence. As Guttman et al. (2006) asserted, witnessing violence leads to the assimilation of aggressive attitudes, as well as replication of aggressive behavior. Relatedly, children who have parents with authoritarian attitudes regarding childrearing and who engage in harsh or inconsistent disciplinary practices are at greater risk for youth violence (Chaffin, 2006; DHHS, 2001). Through the lens of social learning theory then, individuals reared by parents who endorse and practice corporal punishment are more likely to develop attitudes in support of such harsh punishment as well as to engage in aggressive behavior. To wit, previous research has demonstrated physical discipline by parents to be

predictive of aggressive behavior in children (Weiss, Dodge, Bates, & Pettit, 1992). Furthermore, adults whose parents used corporal punishment on them as children have demonstrated increased supportive attitudes regarding aggression between intimate partners (Button, 2008).

Additionally, more recent research has demonstrated the harmful effects of observing violence through various forms of media (e.g., television, video games) on the evolution of youth violence (e.g., Anderson et al., 2008; Huesmann, 2007; Nader, 2010; Wang et al., 2006), and this observational learning can manifest in proviolence attitudes. In regard to violence observed through media and culture, Carnagey and Anderson (2007) studied attitudes toward war and violence before and after the September 11, 2001 attacks on the United States. Participants did not directly witness the 9/11 attacks nor the subsequent wars that ensued, but rather observed and heard about such war and violence through numerous forms of media and in the culture at large. Carnagey and Anderson found that attitudes towards war became more positive following 9/11, as did attitudes towards penal code violence (e.g., capital punishment). Moreover, the research demonstrated that participants' reported trait physical aggression increased after 9/11 (Carnagey & Anderson, 2007). Clearly, proviolence attitudes related to war and capital punishment can be learned via large-scale events that happen in our society and culture.

*Sex differences.* Notable differences across sex have been documented regarding attitudes toward violence as well as perpetration of violence. Research has consistently demonstrated that males hold somewhat more favorable attitudes toward violence and engage in more violence compared to females (e.g., Anderson, Benjamin, Wood, & Bonacci, 2006; Carnagey & Anderson, 2007; Lonsway and Fitzgerald, 1995; Nabors & Jasinski, 2009; Riggs & O'Leary, 1996; Smith Slep, Cascardi, Avery-Leaf, & O'Leary, 2001; Slovak et al., 2007). For example, Slovak et al. (2007) found that compared to females, males evidenced higher levels of both aggressive responses to shame and comfort with aggression. Additionally, Carnagey and Anderson (2007) provided evidence that males endorse more positive attitudes regarding both war and penal code violence compared to females. Relatedly, Anderson et al. (2006) demonstrated that males have more favorable attitudes toward violence in intimate relationships, war, penal code, and corporal punishment compared to females. Other research has also found males to demonstrate greater acceptance of violence in intimate or dating relationships than females (Nabors & Jasinski, 2009; Riggs & O'Leary, 1996; Simon et al., 2001; c.f., Smith Slep et al. 2001). Regarding perpetration of violence and/or engagement in aggressive behaviors, Carnagey and Anderson (2007) found that males exhibited higher levels of trait physical aggression and verbal

aggression compared to females. Similarly, the CDC (2010b) reported that more males than females indicated involvement in physical fights and disclosed bringing a weapon to school. In terms of violence between dating partners, females in the U.S. report approximately 4.8 million physical assaults and rapes annually, whereas men report 2.9 million of these assaults (Tjaden & Thoennes, 2000). Relatedly, nearly 2,500 deaths in 2007 were the result of intimate partner violence, and of these, 30% were males and 70% were females (Department of Justice, Bureau of Justice Statistics, 2011).

### *Intervention and Measurement*

Prevention and early intervention efforts regarding youth violence are clearly needed. Fowler and Braciszewski (2009) asserted that such efforts should be specifically targeted for youth and that they should attend to the various roots and risk factors of violence. Additionally, it has been noted that there have been few rigorously evaluated youth violence preventive interventions, particularly those that are comprehensive and/or environmentally or community based (Fowler & Braciszewski, 2009; Kenny & Hage, 2009; Schwartz & Lindley, 2009). A basic premise of selecting measures for use in research or practice is to choose instruments that are valid for specific use with the type of population under study. In *Standards for Educational and Psychological Testing* (American Educational Research Association, 1999), clear benchmarks are delineated such that “considerations for test selection should include...the availability of norms and evidence of validity for the population representative of the test taker” (p. 131). Additionally, it is important to select measures that contain the appropriate content and/or constructs under investigation. In considering instruments to employ with preventive and early interventions aimed at youth violence, it seems imperative to incorporate various components of violence including aspects regarding family, intimate relationships, and the wider culture. Through a literature review for violence-related measures, the Attitudes Toward Violence Scale, developed by Velicer, Huckle, and Hansen (1989) and later abbreviated by Lonsway and Fitzgerald (1995), stood out as an instrument comprising a spectrum of violence-related attitudes.

*Attitudes Toward Violence Scale.* Lonsway and Fitzgerald (1995) developed the Attitudes Toward Violence Scale (ATV) based on a longer measure (i.e., 48 items) originally developed by Velicer et al. (1989). They aimed to use the ATV as a measure of acceptance of interpersonal violence defined by Burt (1980) as “the notion that force and coercion are legitimate ways to gain compliance and specifically that they are legitimate in intimate relationships”

(p. 218). Lonsway and Fitzgerald indicated the need for an acceptance of interpersonal violence scale to operationalize the construct to include simultaneous emphasis on corporal and capital punishment, as well as disputes between individuals.

In developing their measure, Lonsway and Fitzgerald (1995) simply selected 20 items from the Velicer et al. version that appeared to capture the domains of war, capital punishment (i.e., penal code violence), corporal punishment, and partner/dating violence. This shorter version could provide greater utility in terms of ease of use and shorter administration time. Although researchers have examined the factor structure of the 48-item Velicer et al. version (e.g., Anderson, Benjamin, Wood, & Bonacci, 2006), factor analyses were not conducted by Lonsway and Fitzgerald on their derived 20-item version. Lonsway and Fitzgerald noted that their version of the ATV lacked psychometric investigation and commented that greater systematic examination was necessary. However, to date, no examinations of the factor structure have been conducted or reported by other researchers. Moreover, there have been no investigations of the use of the ATV with a high school sample, thus, it is also unknown what dimensions the ATV reliably measures regarding high school-aged adolescents' attitudes.

Another measure with a very similar name was developed by Funk, Elliott, Urman, Flores, and Mock (1999). These researchers developed their own Attitudes Towards Violence Scale to address the lack of an empirically based scale specific to adolescents. The Funk et al. (1999) scale measures two components: reactive violence and culture of violence. They described the *reactive violence* items to be reflective of attitudes regarding a person's response to a proximate threat, whereas *culture of violence* items tap into an individual's attitude that the world is dangerous and that she/he is likely to be both victim and perpetrator of violence. Although this measure makes an important contribution to the literature by providing a psychometrically sound instrument, it does not include items that address components of partner/dating violence, corporal punishment, capital punishment, or war.

Therefore, if Lonsway and Fitzgerald's (1995) ATV is found to have strong psychometric properties with an adolescent sample, these two instruments could be utilized in conjunction to measure a broader range of attitudes toward violence. This more comprehensive evaluation of attitudes toward violence answers the calls of Fowler and Braciszewski (2009) to attend to a broad spectrum of violence components. Thus, the purpose of the present study was to examine the factor structure of Lonsway and Fitzgerald's (1995) ATV with a sample of high school-aged adolescents. Additionally, given previous research regarding sex differences in both attitudes and behavior related

to violence, the ATV was examined to determine the extent to which adolescent males and females differed.

## Method

### Participants

Data for this investigation were collected from students attending two, Midwestern high schools located in two small cities. The University's Institutional Review Board (IRB) approval was obtained, as was approval from the respective school districts and individual schools. Written, active parental consent and youth assent were obtained for each participant. Participants included a total of 383 high school students, representing an approximate 78% participation rate. Twenty-four cases (6.2%) were deleted listwise from all analyses due to missing data, resulting in a final sample of 359. Males ( $n = 167$ , 46.5%) and females ( $n = 192$ , 53.5%) were fairly evenly represented, with ages ranging from 14 to 19 years ( $M = 16.10$  years,  $SD = 1.27$ ). There were 64 (17.8%) freshman, 94 (26.2%) sophomore, 79 (22.0%) junior, and 122 (34.0%) senior students, and 9.2% were eligible for free lunch, an indicator of SES. Race/ethnicity was distributed as follows: 0.3% Latino, 1.4% Black/African American, 1.7% Multiracial, 1.9% Asian American, 3.1% Native American Indian, and 90.5% White/Caucasian.

### Instrument

*Attitudes Toward Violence Scale (ATV)*. The ATV consists of 20 items that Lonsway and Fitzgerald (1995) derived from a longer scale consisting of 48 items constructed by Velicer et al. (1989). In developing their measure, Lonsway and Fitzgerald selected 20 items from the Velicer et al. version that appeared to capture war, capital punishment, corporal punishment, and partner/dating violence. No factor analytic techniques were utilized in developing or analyzing these 20 selected items, and their development study utilized undergraduate males and females as the study participants. Although subscales are not utilized, the ATV purportedly measures two constructs: (a) "attitudes toward violence in interpersonal relationships" and (b) "attitudes toward violence in other domains" (e.g., war and capital punishment; Lonsway & Fitzgerald, 1995, p. 706). Items were written in a positive direction only and respondents rate their level of agreement to each item based on a 7-point scale ranging from 1 (*not at all agree*) to 7 (*very much agree*). All items are listed in Table 1. A total score of attitudes toward violence is computed by summing

**Table 1.** Three-Factor ATV Solution From Principal Axis Extraction and Promax Rotation (N = 359)

Attitudes Toward Violence Scale Item	Unrotated Factor Coefficients		Promax Rotated Factor Pattern Coefficients			h <sup>2</sup>
	Factor I (GV)	Factor I (CP)	Factor II (CW)	Factor III (PV)		
1. Violent crimes should be punished violently.	.38	.03	.41	.08	.20	
2. death penalty should be part of every penal code.	.38	.13	.25	.11	.15	
3. Any prisoner deserves to be mistreated by other prisoners in jail.	.45	.25	.21	.10	.20	
4. Any nation should be ready with a strong military at all times.	.32	-.15	.69	-.06	.39	
5. The manufacture of weapons is necessary.	.49	-.02	.75	-.05	.54	
6. War is often necessary.	.51	.11	.61	-.05	.44	
7. The government should send armed soldiers to control violent university riots.	.42	.08	.45	.05	.25	
8. Our country should be aggressive with its military internationally.	.52	-.06	.73	.06	.51	
9. Killing of civilians should be accepted as an unavoidable part of war.	.41	.15	.28	.11	.18	
10. Our country has the right to protect its borders forcefully.	.44	.04	.62	-.07	.39	
11. A child's habitual disobedience should be punished physically.	.59	.63	.01	.03	.42	
12. Giving mischievous children a quick slap is the best way to quickly end trouble.	.66	.71	.05	-.01	.53	
13. Children should be spanked for temper tantrums.	.66	.78	.09	-.13	.60	
14. Punishing children physically when they deserve it will make them responsible and mature adults.	.64	.91	-.10	-.13	.66	
15. Young children who refuse to obey should be whipped.	.69	.72	-.05	.12	.58	
16. It is all right for a partner to hit the other if they are unfaithful.	.57	.10	.02	.69	.55	
17. It is all right for a partner to slap the other if insulted or ridiculed.	.53	-.09	-.01	.89	.73	
18. It is all right for a partner to slap the other's face if challenged.	.55	-.02	.04	.78	.61	
19. An adult should whip a child for breaking the law.	.66	.50	.01	.31	.49	
20. It is all right for a partner to hit the other if they flirt with others.	.54	-.03	-.05	.89	.74	
Eigenvalues		6.11	2.70	1.73		
% Variance (Rotation)		28.06	11.29	6.46		
$r_{\alpha}$	.87 <sup>a</sup>	.87 <sup>b</sup>	.80 <sup>b</sup>	.88 <sup>b</sup>		

Note: GV = General Attitudes Toward Violence, CP = Corporal Punishment, CW = Crime and War, PV = Partner Violence. Salient factor structure coefficients ( $\geq .40$ ) are presented in bold.  $h^2$  = communality,  $l$  internal consistency ( $r_{\alpha}$ ) estimate for total scale (all items included),  $l$  internal consistency ( $r_{\alpha}$ ) estimates based on items with salient factor structure coefficients ( $\geq .40$ ). Factor correlations from oblique solution were as follows:  $r_{I,II} = .48$ ,  $r_{I,III} = .46$ ,  $r_{II,III} = .21$ . Based on salient factor pattern coefficients  $\geq .40$ , Factor I (CP) includes ATV items 11, 12, 13, 14, 15, and 19; Factor II (CW) includes ATV items 1, 4, 5, 6, 7, 8, and 10; and Factor III (PV) includes ATV items 16, 17, 18, and 20.



across all 20 items, thus, the total possible score ranges from 20 to 140. Lonsway and Fitzgerald (1995) did not discuss subscale scores despite developing their measure to comprise two separate domains. Higher scores reflect more accepting attitudes toward violence as a whole. Regarding validity and reliability, the ATV scores exhibited moderate correlations with the Acceptance of Interpersonal Violence Scale ( $r = .48$ ), Adversarial Sexual Beliefs Scale ( $r = .51$ ), and Rape Myth Scale ( $r = .47$ ), and adequate internal consistency reliability ( $\alpha = .87$ ; Lonsway & Fitzgerald, 1995).

### *Procedure*

During a regular class period on one school day, each participant was administered the ATV as part of a larger survey packet being used for a scale construction study. Demographic variables including sex, age, race/ethnicity, and grade level were also collected. The study was described as a survey about their attitudes regarding violence in different contexts.

### *Analyses*

Because there were no previous studies examining the factor structure of Lonsway and Fitzgerald's (1995) 20-item ATV with adults *or* adolescents, the present study used exploratory factor analysis (EFA) to examine the latent structure of the 20 ATV items (Byrne, 2006). Since four items had skewness indexes exceeding 2 and four items had kurtosis indexes exceeding 7, principal axis extraction was used (Cudeck, 2000; Fabrigar et al., 1999; Tabachnick & Fidell, 2007). Principal axis factor analyses were used to analyze shared variance from the ATV item correlation matrix using SPSS 17.0. While useful to bifurcate samples and explore both EFA and confirmatory factor analyses (CFA), the present study found some item communality estimates to be low and randomly splitting the sample in half would have produced samples likely too small for separate EFA and CFA (Fabrigar et al., 1999; Tabachnick & Fidell, 2007). As recommended by Gorsuch (1983), multiple criteria for determining the number of factors to retain were examined and included eigenvalues  $> 1$  (Guttman, 1954), the visual scree test (Cattell, 1966), standard error of scree ( $SE_{Scree}$ ; Zoski & Jurs, 1996), Horn's parallel analysis (HPA; Horn, 1965), and minimum average partials (MAP; Velicer, 1976). The scree test was used to visually determine the optimum number of factors to retain but is a subjective criterion. The  $SE_{Scree}$ , reportedly the most accurate objective scree method (Nasser, Benson, & Wisenbaker, 2002), was used as programmed by Watkins (2007). HPA and MAP were

included as they are typically more accurate and are helpful so as not to overfactor (Frazier & Youngstrom, 2007; Thompson & Daniel, 1996; Velicer, Eaton, & Fava, 2000). HPA indicated meaningful factors when eigenvalues from the sample data were larger than eigenvalues produced by random data containing the same number of participants and factors (Lautenschlager, 1989). Random data and resulting eigenvalues for HPA were produced using the Monte Carlo PCA for Parallel Analysis computer program (Watkins, 2000) with 100 replications to provide stable eigenvalue estimates. The MAP criterion was computed using the SPSS syntax code supplied by O'Connor (2000). The highest number of factors suggested by any criterion was the starting point for examination of potential factor structure because, as indicated by Wood, Tataryn, and Gorsuch (1996), it is generally better to overfactor in initial factoring than underfactor.

Final exploratory models were determined viable when resulting factors included (a) at least three items (Velicer & Fava, 1998), (b) item factor pattern coefficients (loadings) were  $\geq .40$  (promax rotation  $\kappa = 4$ ) (Stevens, 2009), (c) achieved simple structure (items saliently loaded on only one factor; Thurstone, 1947), and (d) produced factor internal consistency estimates  $\geq .70$  (Nunnally, 1978). Factors were rotated obliquely to examine and allow for correlated factors.

Once the factor structure was determined with the total sample, factor invariance was explored across sex using three invariance indicators included in the Invariance program (Watkins, 2005). These included the salient variable similarity index (Cattell, 1949; Cattell & Baggaley, 1960), chi-square goodness of fit test (Jensen, 1980), and coefficient of congruence (Gorsuch, 1983; Jensen, 1998). If the ATV factor structure was similar across sex then further comparisons of sex differences on resulting factors could be meaningfully examined. MANOVA and ANOVA were used to examine differences between male and female participants on the ATV factors and total score, respectively. Cohen's (1988) descriptors for the  $d$  effect size estimate were used, where  $.20 =$  small,  $.50 =$  medium, and  $.80 =$  large.

## Results

### *Exploratory Factor Analyses*

Exploratory factor analysis produced a Kaiser-Meyer-Olkin Measure of Sampling Adequacy coefficient of  $.87$ , exceeding the minimum criterion of  $.60$  (Kaiser, 1974) for conducting a factor analysis. Bartlett's Test of Sphericity (Bartlett, 1954) was  $3015.86$ ,  $p < .0001$ ; indicating that the correlation matrix

was not random. Communality estimates ranged from .15 to .74 ( $Mdn = .50$ ). Given the present communality estimates, number of variables, and factors, the present sample was judged adequate for EFA (Fabrigar et al., 1999; MacCallum, Widaman, Zhang, & Hong, 1999). While the  $SE_{Scree}$  criterion suggested five factors, this extraction resulted in the fifth factor possessing only one item with a salient factor pattern coefficient and the fourth factor had only two items with salient factor pattern coefficients and judged not viable. The eigenvalue  $> 1$ , visual scree test, and HPA criteria suggested four latent factors, however, the fourth factor included only two items with salient factor pattern coefficients and the fourth factor internal consistency estimate was inadequate ( $\alpha = .61$ ), thus not viable. The MAP criterion suggested a three-factor solution that satisfied all a priori viability criteria. Table 1 provides detailed information regarding the three-factor solution. As frequently provided in factor analyses of tests of intelligence, unrotated factor coefficients (loadings) on the first factor were examined as an indication of each item's relationship (correlation) to an overall general factor (General Violence [GV]) and ranged from .32 to .69. Factor I (Items 11, 12, 13, 14, 15, and 19) accounted for 28.06% of variance and  $\alpha = .87$ . Salient items for Factor I appear to relate to corporal punishment (CP) and was so named. Factor II (Items 1, 4, 5, 6, 7, 8, and 10) accounted for 11.29% of variance and  $\alpha = .80$ . Salient items within Factor II related to contexts of crime and war (CW) and was so named. Factor III (Items 16, 17, 18, and 20) accounted for 6.46% of variance and  $\alpha = .88$ . Salient items within Factor III related to partner violence (PV) and was so named. Items 2, 3, and 9 did not saliently load on any of the three extracted factors in the present sample. Based on promax rotation, factors I and II, I and III, and II and III had correlations of .49, .46, and .22, respectively, suggesting a higher order general dimension. These correlations indicated moderate positive relationships between attitudes regarding corporal punishment and crime and war, and between corporal punishment and partner violence. The relationship between attitudes about crime and war and partner violence was small.

### **Factorial Invariance Analyses**

To investigate the degree to which the three-factor (and single general factor) ATV structure was similar for males and females, three methods to estimate factorial invariance were used as programmed by Watkins (2005). Results of these three methods are presented in Table 2. The salient variable similarity index ranges from +1.0 to -1.0 with 0 indicating chance agreement and +1.0 indicating perfect agreement. Results in the present study found the ATV

**Table 2.** Factor Invariance Indicators Comparing Factor Pattern Coefficients Between Males ( $n = 167$ ) and Females ( $n = 192$ )

	Factor Invariance Indicator		
	$s$	$\chi^2$	$r_c$
Three factor solution			
ATV Factor I (CP)	1.000	2.848	.944
ATV Factor II (CW)	.857	1.286	.971
ATV Factor III (PV)	1.000	3.859	.955
One factor solution			
ATV Factor I (GV)	.733	2.960	.963

Note: ATV = Attitudes Toward Violence Scale, CP = Corporal Punishment, CW = Crime and War, PV = Partner Violence, GV = General Attitudes Toward Violence,  $s$  = Salient Variable Similarity Index (factor coefficient salience set at  $\pm .40$  [Velicer, Peacock, & Jackson, 1982]),  $r_c$  = Coefficient of Congruence.  $r_c$  values between “.98 and 1.00 = excellent, .92 and .98 = good, .82 and .92 = borderline, .68 and .82 = poor, and below .68 = terrible” (MacCallum, Widaman, Zhang, & Hong, 1999, p. 93). All  $\chi^2$  values not statistically significant (Bonferroni adjusted  $\alpha = .0125$ ).

factors to be quite similar for males and females with Factor I (CP) and Factor III (PV) showing perfect agreement ( $s = 1.0$ ) and Factor II (CW) showing high agreement ( $s = .857$ ). The overall general factor (GV) dimension also achieved a fairly high salient variable similarity index ( $s = .733$ ). The chi-square goodness of fit between factor pattern coefficients produced by males and females “simultaneously tests for differences in *pattern* of loadings and *size* of loadings” and “does not require that the major and minor samples be of equal size” (Jensen, 1980, p. 449). In the present study, Factor I (CP), Factor II (CW), Factor III (PV), and the ATV one-factor solution (GV) dimensions all showed no statistically significant differences between males and females with Bonferroni adjusted  $\alpha = .0125$ . The coefficient of congruence also ranges from +1.0 to -1.0 and is an index of factor similarity. Jensen (1998) noted for congruence coefficients ( $r_c$ ) “+.90 is considered a high degree of factor similarity; a value greater than +.95 is generally interpreted as practical identity of the factors” (p. 99). In the present study all coefficients of congruence for all comparisons were high and classified “good” (MacCallum, Widaman, Zhang, & Hong, 1999, p. 93), also indicating ATV factor invariance across sex. Thus, it appears that the ATV items are measuring the same latent dimensions for both males and females.

Inspection of rotated factor pattern coefficients produced by the male and female participants yielded an interesting finding. All items were associated with the same factors as obtained with the total sample with the exception of

**Table 3.** Univariate ANOVAs for Attitudes toward Violence Scale Factors

ATV Factor	SS	SS Error	MS	MS Error	F	p	$\eta^2$
CP	3722.84	19,074.28	3722.84	53.43	69.68	.0001	.16
CW	1442.06	24,922.61	1442.06	69.81	20.66	.0001	.06
PV	224.00	4,431.30	224.00	12.41	18.05	.0001	.05

Note: MANOVA Attitudes toward Violence Scale Factors: Wilks's  $\Lambda = .83$ ,  $F(3, 355) = 73.60$ ,  $p < .0001$ , Partial  $\eta^2 = .172$ , Power = 1.0. Univariate ANOVA  $F$  tests  $df(1, 357)$ . On all significant effects males obtained higher ATV scores than females. ATV = Attitudes Toward Violence Scale, CP = Corporal Punishment, CW = Crime and War, PV = Partner Violence,  $\eta^2$  = partial eta squared.

items 1 and 9. Item 1 obtained a salient factor pattern coefficient on Factor II (CW) for the males (as observed in the total sample) but did not achieve a salient factor pattern coefficient on any factor for the females based on the a priori .40 criterion (CW loading = .39 [highest loading]). Item 9 achieved a salient factor pattern loading on Factor II (CW) for the females but did not achieve a salient factor pattern coefficient on any factor for the males (CW loading = .18 [highest loading]) as observed in the total sample.

### ATV Sex Differences

One-way MANOVA for differences between the males and the females with the three ATV factors (CP, CW, PV) serving as dependent variables was statistically significant, Wilks's  $\Lambda = .83$ ,  $F(3, 355) = 73.60$ ,  $p < .0001$ , partial  $\eta^2 = .17$ . Subsequent one-way univariate ANOVAs were statistically significant for all three ATV factors (see Table 3). Table 4 includes the descriptive statistics and effect size estimates for the three ATV factors. Males obtained significantly higher scores than females on all three ATV factors. The effect size for the CP factor was large while effect sizes for the CW and PV factors were small to moderate (Cohen, 1988). The one-way ANOVA for sex differences on the ATV total score was also statistically significant,  $F(1, 357) = 64.19$ ,  $p < .0001$ ,  $R^2 = .15$ . Males ( $M = 64.36$ ,  $SD = 17.08$ ) had significantly higher ATV total scores than females ( $M = 50.47$ ,  $SD = 15.75$ ) and the effect size was large ( $d = .85$ ).

### Discussion

The primary purpose of the present study was to examine the factor structure of Lonsway and Fitzgerald's (1995) Attitudes Toward Violence (ATV)

**Table 4.** Descriptive Statistics, *F*, and Effect Size Estimates for Sex Differences on the Attitudes Toward Violence Scale Factors

ATV Factor	Male		Female		<i>F</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
CP	19.26	7.68	12.81	6.97	69.68	.88
CW	30.18	8.46	26.16	8.27	20.66	.48
PV	6.68	4.24	5.10	2.76	18.05	.45

Note: ATV = Attitudes Toward Violence Scale, CP = Corporal Punishment, CW = Crime and War, PV = Partner Violence, *d* = Cohen's *d* effect size estimate (Cohen, 1988).

Scale with a sample of high school-aged adolescents. Additionally, the study aimed to evaluate potential sex differences on the ATV. Results indicated that a three-factor solution was the most parsimonious and satisfied all a priori viability criteria. The three factors, comprised of 17 of the 20 items, were named Corporal Punishment (CP;  $\alpha = .87$ ), Crime and War (CW;  $\alpha = .80$ ), and Partner Violence (PV;  $\alpha = .88$ ) based on the item content. Each factor demonstrated adequate internal consistency for research purposes and approached minimum levels recommended for individual decision making ( $\geq .90$ ; Salvia & Ysseldyke, 2001). Three of the original 20 items (2, 3, and 9) did not adequately load on any of the three extracted factors, but were fairly well associated with the overall general dimension (GV) of attitudes toward violence. Including all 20 items in the total ATV GV produced an acceptable internal consistency estimate ( $\alpha = .87$ ).

More specifically, the findings of the factor analyses and subsequent statistical examination provided important evidence for the potential utility of the ATV for high school-aged adolescents. Results indicated that 17 of the original 20 items derived by Lonsway and Fitzgerald (1995) contributed to three, psychometrically sound factors representing distinct dimensions of attitudes toward violence including Corporal Punishment, Crime and War, and Partner Violence. These three constructs are consistent with Lonsway and Fitzgerald's (1995) conceptualization of "attitudes toward violence in interpersonal relationships" and "attitudes toward violence in other domains" (e.g., war and capital punishment; p. 706), but are more clearly delineated in the present study. These three factors also demonstrated conceptual overlap with four of the five factors of the original 48-item ATV (Velicer et al., 1989) which consisted of Violence in War, Penal Code Violence, Corporal Punishment of Children, Extreme Interpersonal Violence, and Intimate

Violence. However, in the present study the second factor was a combination of the Velicer et al. Violence in War and Penal Code Violence dimensions. As Lonsway and Fitzgerald did not include items from the Extreme Interpersonal Violence subscale of the Velicer et al. version, this factor did not emerge in the current study.

Although three items (2, 3, and 9) in the present study did not load on or contribute to the three factors in meaningful ways, they had fair association with the overall, general ATV (GV). Thus, with the present sample, Items 2 (“The death penalty should be part of every penal code”), 3 (“Any prisoner deserves to be mistreated by other prisoners in jail”), and 9 (“Killing of civilians should be accepted as an unavoidable part of war”) contributed to the measurement of general attitudes toward violence, but not to the three subfactors of corporal punishment, crime and war, and partner violence. This finding may be sample specific or developmentally related, or it may simply reflect sampling error. Inspection of item content for these three items suggests they ought to load on the CW factor or split the CW factor into two separate factors of “crime” and “war.” Future research may assist in determining which is more psychometrically viable.

The finding that the CP factor was moderately correlated with both the CW and PV factors was interesting and relates to research indicating the association between harsh and physically punishing parenting approaches as a risk factor for youth aggression and violence (Button, 2008; Chaffin, 2006). Attitudes about violence related to crime and war were less related to partner violence attitudes among the current sample as observed by the small correlation between the CW and PV factors. This finding appears to demonstrate that acceptance of violence in the areas of crime and war may not extend to an acceptance of aggression in all situations, particularly with respect to intimate partner relationships.

Regarding factorial invariance, results indicated that the three-factor ATV structure and the single general factor structure did not differ across sex. That is, the structure of the ATV does not differ for adolescent males and females. These findings are consistent with those of Anderson et al. (2006) in their evaluation of the original 48-item version. Despite the three-factor structure and the one-factor general dimension revealing factorial invariance between male and female participants, two items demonstrated different factor pattern coefficients for males and females and is most likely a result of sampling error.

Because the three-factor structure and the general single-factor structure were virtually identical for males and females, comparison of males and females was acceptable. Results demonstrated that males obtained significantly

higher scores than females on all three ATV factors and the total ATV with moderate to large effect sizes, findings consistent with previous research on behavioral violence (e.g., CDC, 2010b; Nabors & Jasinski, 2009), and consistent with the results of Anderson et al. (2006) in their evaluation of the original 48-item version. Sex differences found in factor pattern coefficients for items 1 (“Violent crimes should be punished violently”) and 9 (“Killing of civilians should be accepted as an unavoidable part of war”) can only be assessed in a replication study. For example, if the same finding is observed in another sample, perhaps there is something incongruent about these two items relative to sex. However, it is unclear why this finding was observed in the current investigation and if it will replicate.

### *Limitations and Future Directions*

The limitations of the current investigation include the use of a self-report measure and the lack of racial/ethnic and geographic diversity among the participants. The primarily White sample in this study limits the ability to generalize the current findings to more racially diverse populations. Also, the current study is limited to the findings of the EFA and differences across sex; that is, given the sample size and the structure of the study, CFA, convergent and divergent validity, and test-retest reliability were not investigated.

Regarding future directions, the present study raises many ideas. Further investigation with respect to the psychometrics of the ATV is warranted, particularly replication of the ATV factor structure and conducting CFA in a new sample of adolescents. Recruiting samples with greater ethnic diversity and in differing geographic areas would also lend support to the ATV’s psychometric strength. Future studies could also explore two of the findings from the current study: (a) examine the three items that did not load saliently on any of the factors for these participants, and (b) test for potential sex differences in the two items that demonstrated varying factor pattern coefficients. As well, examination of relations between the ATV and external criteria are necessary to provide convergent and discriminant validity and diagnostic utility.

Future research should also focus on the wider implications of having a psychometrically valid, comprehensive measure of attitudes toward violence for adolescents. Investigations should utilize the ATV with behavioral measures or indicators of risk-factors and/or violence perpetration to evaluate the respective relations between this attitudinal measure and actual violent behavior or tendencies. Relatedly, collecting data regarding participants’



exposure to violence and utilizing this information to examine potential differences in ATV subscale mean scores would shed light on potential ramifications of such exposure. As well, prevention and interventions programs that are comprehensive in nature could be evaluated at pre-, post-, and follow-up intervention intervals using the ATV as a primary outcome and evaluation measure. Furthermore, investigations that employ this version of the ATV in conjunction with the adolescent specific Attitudes Towards Violence Scale created by Funk and colleagues (1999) could examine the combined merits of both measures.

## Conclusion

This investigation examined the factor structure of the Attitudes Toward Violence Scale (ATV; Lonsway & Fitzgerald, 1995) with a sample of high school-aged adolescents and contributes to the literature in a number of ways. First, the present study responds to Lonsway and Fitzgerald's own commentary that their version of the ATV lacked psychometric investigation and required greater systematic examination. Second, this study adds to the extant literature regarding measures that incorporate a more comprehensive view of violence components and risk factors (Fowler & Braciszewski, 2009). Finally, this investigation provides important evidence for the appropriate use of the ATV with adolescent samples.

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