

# Injury Dimensions in Female Victims of Intimate Partner Violence: Expanding the Examination of Associations With Symptoms of Posttraumatic Stress Disorder

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This study examined the types, frequency, and location of acute and residual injuries (violence-related marks or scars) of 345 victims of moderate-severe intimate partner violence (IPV). Acute facial injuries were common with facial bruising reported by 83%, facial lacerations reported by 44%, and damaged teeth reported by 20% of the sample. Fifty-six percent of the sample reported at least 1 mark or scar resulting from their acute injury. Having an IPV-related residual injury was associated with reports of significantly more severe forms of past-year violence (physical assault and 2 forms of psychological maltreatment), total number of acute injuries, and symptoms of posttraumatic stress disorder (PTSD) and depression. Moreover, positive residual injury status and 2 forms of psychological maltreatment predicted significant and unique variance in PTSD (but not depression), controlling for length of abuse and severity of physical assault. Within the residual injury subsample, body image distress associated with the residual injury and 1 form of psychological maltreatment predicted significant variance in PTSD (but not depression), controlling for length of abuse, severity of physical assault, and number of acute injuries. Implications for the multiple dimensions of injury were discussed.

*Keywords:* PTSD, depression, injury, violence, body image

The National Intimate Partner Violence and Sexual Assault Survey, an ongoing, nationally representative telephone survey of 16,507 adults, documented that at least one in seven women have experienced a lifetime injury as a result of rape, physical violence and/or stalking by an intimate partner (Black et al., 2011). Intimate partner violence (IPV), generally, is associated with a dose-response relationship between violence exposure and psychological morbidities of posttraumatic stress disorder (PTSD) and depression (Golding, 1999). IPV-related injury, specifically, can confer added risk to these morbidities (Levine, Degutis, Pruzinsky, Shin & Persing, 2005; Wilson et al., 2011). In spite of these documented associations, theories are largely silent on the factors linking violence-related injury to these psychological outcomes (cf. Koren, Hemel & Klein, 2006). The current study was designed to sharpen the examination of IPV-related injuries by exploring multiple injury dimensions, including the type, frequency, and location of acute (immediate) and residual (lasting) injuries within

a sample of women exposed to physical violence by their intimate partners. These dimensions were explored to advance theory addressing the psychological impact of injury.

Acute injuries refer to injuries that have a sudden occurrence and relatively short course. IPV-distinctive acute injuries include injuries to the head, face, and neck (Crandall, Nathens & Rivara, 2004), multiple injuries and specific injury forms including ruptured tympanic membrane, strangulation-related sequelae (Wu, Huff, & Bhandari, 2010), and maxilla-facial or ocular injuries (Halpern, 2010). These acute injury patterns not only underscore the multiplicity and heterogeneity of IPV-related injuries but also the centrality of the head, face, and neck as a primary region of impact.

Because the face conveys meaning related to the self and identity, injuries to the head, face, and neck may have important psychological implications (Young, deHaan & Bauer, 2008). In addition, the meaning of these injuries may be further amplified when these injuries affect appearance in the short or longer term. Weaver and colleagues (Weaver, Turner, Schwarze, Thayer, & Carter-Sand, 2007) examined the psychological impact of IPV-related injuries in a preliminary study. Sixteen female victims of IPV with an appearance-related residual injury (typically a mark or scar) met in groups of three to five participants and discussed their experiences with their residual injuries. Using qualitative analysis, participants indicated that residual injuries had implications for thoughts about the self, served as IPV-related triggers, and had associations with body-focused behaviors and concerns.

Because IPV-related residual injuries can be associated with body-focused perceptions, behaviors, and concerns, the examination of injury-related sequelae was broadened to include the con-

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struct of body image. Body image is a multidimensional construct that refers to an individual's subjective sense of their body focusing primarily, though not exclusively, on appearance and encompassing behavioral, perceptual, cognitive, and affective phenomena (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). At the clinically significant level, body image concerns are core components of eating disorders (Zanetti, Santonastaso, Sgaravatti, Degortes & Favaro, 2012) and body dysmorphic disorder (Cororve & Gleaves, 2001). Although both these disorders have been associated with potentially traumatic events (Becker & Grilo, 2011; Didie et al., 2006), theoretical conceptualizations have not explicitly linked injury and body image distress as trauma-related sequelae. Nevertheless, preliminary empirical evidence suggests there may be an association. In a study of 56 female victims of moderate to severe IPV (31 with an appearance-related residual injury and 26 without), Weaver, Resnick, Kokoska and Etzel (2007) found that residual injury status moderated the association between body image distress and PTSD, such that these two constructs were significantly and positively associated, but only for those with residual injury. Moreover, within the residual injury subgroup, body image distress was a unique predictor of PTSD symptoms, above and beyond that predicted by trauma severity.

Taken together, preliminary findings suggest that IPV-related residual injuries may have a significant impact on psychological functioning, including implications for trauma-related meaning, body image distress, and PTSD. However, the extant findings were based on small sample sizes and relevant outcomes, such as depression, were not explored. The current study sought to remedy these shortcomings by examining the types, frequency, and location of acute and residual injuries within 345 victims of moderate-severe forms of physical IPV. It was hypothesized that female victims with an appearance-related residual injury would report significantly more severe symptoms of PTSD and depression. Because of the expectation that residual injuries may serve as trauma-related cues, positive residual injury status was expected to uniquely predict severity of symptoms of PTSD controlling for abuse-related characteristics (e.g., length of abuse, severity of physical assault, and two forms of psychological maltreatment). Descriptive features of body image distress were explored for those reporting a residual injury to determine the frequency of these concerns within this subsample. Body image distress was also explored as a unique predictor of PTSD and depression controlling for abuse-related characteristics (e.g., length of abuse, severity of physical assault, two forms of psychological maltreatment, and number of acute injuries).

## Method

### Recruitment/Screening Criteria

Participants were recruited from residential and nonresidential community IPV agencies. Prospective participants were screened by telephone for eligibility. The following criteria were used to screen potential participants: (a) Participants were required to have been in an intimate relationship, whether cohabiting or not, for a minimum of 3 months; (b) the most recent episode of violence had to have occurred more than 2 weeks (to avoid potential inflation of symptom scores) and less than 6 months before the assessment. In addition, to obtain a sample of women who experienced more than

the occasional episode of relationship violence, with this identified partner: (c) participants had to experience at least four incidents of minor violence (e.g., pushed, shoved or grabbed you) or two episodes of severe violence (e.g., hit or punched you, slammed you against a wall, caused you to fear for your life or the lives of your family members) or some combination of four incidents of minor and/or severe violence within the past year. The inclusion criteria were crafted to meet the aims of the parent study, which focused on a multimethod assessment for examining cognitive and information processing and PTSD within female victims of IPV. Taken together, the relationship criteria was set at a minimum of 3 months to restrict the sample to those who were in relationships that were more committed and the abuse criteria was set at the moderate to severe end of the continuum to include women experiencing greater levels of violence exposure.

Participants who were excluded based on their telephone screening were provided appropriate community resources. Sixty-seven women were screened out of the study because of failing to meet the temporal relationship requirement, failing to meet the violence severity or recency criteria, and unstated reasons. Twelve women were terminated from study participation due to apparent psychosis, suicidality, substance intoxication, or other potentially compromising factors. Fourteen participants' data were dropped from the final data set for validity reasons. The final sample size for analysis was 345.

### Participants

Demographic characteristics of the sample are listed in Table 1. On average, the participants were in their mid-30s, impoverished, had achieved a high school education, and were disproportionately African American. Nearly half ( $n = 171/344$ ) of the sample were residing in a shelter and had been living with a partner. On average, the women had relationships that were nearly 7 years in length and the length of abuse averaged nearly 5 years with relatively recent relationship departures.

### Measures

The Psychological Maltreatment of Women Inventory—abbreviated version (PMWI; Tolman, 1989, 1999) consists of two factor-derived subscales that measure dominance/isolation (DI) and emotional and verbal abuse (EV). Each item is rated on a 5-point frequency scale, ranging from 1 (*never*) to 5 (*very frequently*) using seven items for each scale. Cronbach's alpha was .87 (DI) and .89 (EV).

Revised Conflict Tactics Scale-2 (CTS-2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996). One subscale of the revised CTS-2 was used to assess the frequency and severity of physical assault (CTS-PA; 12 items). Ratings were made in terms of frequency (0 = never; 1 = once in past year; 2 = twice in past year; 3 = 3–5 times in past year; 4 = 6–10 times in past year; 5 = 11–20 times in past year; 6 = more than 20 times in past year). Midpoint scoring was used according to the author's instructions (Straus, Hamby, Boney-McCoy, & Sugarman, 1996) and a total physical assault subscale was created by combining minor and severe acts of violence (Cronbach's  $\alpha = .90$ ).

The Standardized Battering Interview (Resick, Mechanic, Astin, & Weaver, unpublished) was developed for this study and con-

Table 1  
*Demographic and Relationship Characteristics of Sample*  
 (N = 345)

	%	M	SD	Min	Max
Age		34.7	8.1	18	62
Length of abuse (years)		4.6	5.4	1 (day)	29 (years)
Length of relationship (years)		6.9	6.4	3 (months)	29 (years)
Time since left relationship (months)		3.6	13.4	0	14 (years)
Education		12.6	1.99	4	19
Ethnic background					
African American	67				
European American	27				
Latina/Hispanic	1.2				
Native American	1.4				
Other	3.2				
Income					
<\$5,000	31.6				
\$5,000–10,000	23.8				
\$10,000–30,000	39.5				
\$31,000	4.2				
Marital status					
Dating	10.7				
Cohabiting	49.9				
Married	28.4				
Separated/divorced	11.0				
Gender of perpetrator					
Male	97.4				
Female	2.6				
Currently living with perpetrator					
Yes	11.6				
No	88.4				
Shelter status					
Nonshelter	50.1				
Shelter	49.6				

sisted of a variety of structured questions assessing demographic and abusive relationship characteristics and were all anchored to the same intimate partner as identified in the inclusion criteria. Participants were also queried about whether they ever experienced a range of IPV-related acute injuries. Each acute injury item was rated on a frequency scale ranging from 0 (*never experienced*) to 4 (*experienced greater than 50 times*). Six items assessed minor acute injuries, including bruises, cuts, and burns and seven items assessed more serious acute injuries including broken or dislocated bones, loss of consciousness, damaged teeth, ruptured ear drums, and damaged internal organs. Location of each acute injury was also assessed as being on the head, face, or neck or on other parts of the body. A total acute injury severity score was created by summing scores that were dichotomized for each of the items (0 = never experienced, 1 = experienced one or more times).

Participants were then asked whether their acute injuries ever left any residual injuries defined as permanent marks or scars denoting 0 (0 permanent marks or scars), 1 (1–3 permanent marks or scars), 2 (4–10 permanent marks or scars), or 3 (>10 permanent marks or scars) changes and identifying their location (s) (head, face, neck, or other parts of their body). Follow-up questions for those with at least one residual injury included asking how frequently participants looked at or “checked-out” their marks or scars, thought about their marks or scars and felt upset, had intense

memories of the IPV when looking at their marks or scars, and or avoided looking at their marks or scars to manage emotional distress—all over the past month (0 = no checking, 1 = 1–3 days, 2 = 4–7 days or once or twice a week, 3 = 8–11 days, 4 = 12–16 days or half of the days of the month, 5 = 17–21 days, or 6 = 22–28 days or checking every day or almost every day). These four questions were selected as a subset of items used in more comprehensive assessments of body image concerns (Rosen, Reiter, & Orosan, 1995).

The Posttraumatic Diagnostic Scale (Foa, Cashman, Jaycox, & Perry, 1997) is a self-report measure of PTSD and provides a checklist of Criterion A stressor events and both a *DSM-IV* PTSD diagnosis (American Psychiatric Association, 1994), as well as a measure of PTSD symptom severity. Respondents completed the five Reexperiencing, seven Avoidance, and five Arousal items. The past month frequency of each item was rated on a 4-point scale ranging from 0 (*not at all or only one time*) to 3 (*five or more times a week/almost always*). The continuous total PTSD symptom score was used ( $\alpha = .90$ ).

The Beck Depression Inventory-Second Edition (BDI-II; Beck, Steer, & Brown, 1996) is a 21-item self-report measure of depressive symptoms. Respondents rated items based on a 4-point Likert scale with higher scores indicating higher levels of depressive symptoms. Internal consistency was high ( $\alpha = .89$ ).

All participants completed a demographics questionnaire that included questions about age, race/ethnicity, income, time since left the relationship, length of abuse, length of relationship, marital and living status, gender of the perpetrator, and education.

## Procedure

The study was conducted within an urban, Midwestern, university-based research setting or within community agencies over the course of 4 years. Participants completed the study in two visits within several days of each other and were paid \$50.00 for their time spent in the initial visit and additional money for time spent in subsequent components of the study. On the initial study visit, after obtaining informed consent, women completed several symptom-based measures programmed onto a laptop computer. Following the completion of symptom-based measures, trauma-trained Master's- or Ph.D.-level female clinicians interviewed participants. Interview material included participant exposure to partner abuse, acute and residual injuries sustained, responses to abuse, and a number of other constructs not relevant to the current analyses. The second day consisted of additional self-report instruments that were programmed onto a laptop computer that were not relevant to the present article. Symptom-based assessments were completed prior to the abuse and violence interview-based questions to avoid symptom elevation secondary to possible situational distress. Debriefings were conducted with participants following completion of all instruments and they were compensated for their time. The current study was approved by the university's Institutional Review Board.

## Results

### Description of Acute and Residual Injuries

Greater than 97% of the sample experienced at least one acute injury and greater than 84% reported experiencing more than one

type of acute injury over the course of their abuse (see Table 2). The most common form of acute injuries was bruises with roughly comparable numbers of bruises reported on the body (86%) as on the head, face, or neck (83%). Women also experienced a range of other injuries to their head, face, or neck including 46% of whom experienced lacerations to this region, 44% of whom experienced loss of consciousness, slightly over 20% of whom experienced damaged teeth, and nearly 14% of whom experienced a ruptured tympanic membrane. The modal number of different acute injuries reported was five.

In terms of residual injuries, 56% ( $n = 193/345$ ) of the sample reported at least one permanent mark or scar on their body (residual injury) with nearly 32% ( $n = 110/345$ ) reporting one to three residual injuries, 18% ( $n = 63/345$ ) reporting four to 10 residual injuries, and nearly 6% ( $n = 20/345$ ) reporting greater than 10 residual injuries. Sixty-one percent (118/193) of those with residual injuries had at least one that was located on their head, face, or neck.

Slightly over half of those with residual injuries ( $n = 99/193$ ) reported checking their marks or scars on 17 or more days of the month to determine the impact on their appearance. Nearly 50% ( $n = 96/193$ ) of those with residual injuries reported thinking of their residual injuries on 17 or more days of the month and feeling upset. Eighty percent (156/193) of the sample reported having intense memories of their abuse when looking at their residual injuries at least 1–3 days per month. Finally, nearly one quarter of those with residual injuries reported avoiding their marks or scars in order to manage their feelings on 17 or more days each month.

### Intercorrelations Among Primary Constructs and Associations With Residual Injury Status

Zero-order correlations were conducted within the entire sample and can be found in Table 3. Significant, small relationships were found between severity of acute injuries and symptoms of PTSD, depression, and both forms of psychological maltreatment and medium relationships found between severity of acute injuries and physical violence. Residual injuries evidenced a significant asso-

ciation with symptoms of PTSD, depression, length of abuse, and length of relationship that was small in magnitude and with severity of physical assault and number of acute injuries that was small to medium in magnitude. Severity of physical assault and psychological maltreatment evidence significant small relationships and symptoms of PTSD and depression were significantly and moderately associated.

Next, possible associations with residual injury status were explored by examining the significant differences in mean scores for those with ( $n = 193$ ) and those without ( $n = 152$ ) a residual injury. Positive residual injury status was associated with significantly more acute injuries, more severe forms of psychological maltreatment and physical assault and more severe symptoms of PTSD and depression (see means and  $t$  tests in Table 4).

### Residual Injury Status as Predictor of Symptoms of PTSD and Depression

Hierarchical regression analyses with forced entry were conducted to explore residual injury status as a unique predictor of symptoms of PTSD and depression. Prior to proceeding with the regression analyses, potential demographic and assault-related covariates were explored by examining associations with total symptoms of PTSD and depression. Potential covariates included length of abuse, dichotomized relationship status (cohabiting vs. all others), race (African American vs. others), and income ( $< \$20,000$  or  $\geq \$20,000$ ). All relationships were nonsignificant with the exception of length of abuse that evidenced a significant association with symptoms of depression and PTSD (see Table 3). Therefore, length of abuse was used as a covariate in subsequent regression analyses.

Two hierarchical multiple regressions were conducted to examine whether residual injury status was a unique predictor of psychological sequelae. In the first regression predicting PTSD symptom severity, length of abuse was entered in the first step, assault characteristics (psychological maltreatment of emotional violence and dominance and isolation, physical assault) were entered on the second step, and residual injury status was entered in the third step.

Table 2  
Type and Frequency of Acute Injury ( $N = 345$ )

Type of injury	Never		1–3 times		4–10 times		11–49 times		$\geq 50$ times	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Bruises (head) <sup>a</sup>	59	17.1	89	25.9	94	27.3	54	15.7	48	14
Bruises (body)	49	14.2	65	18.8	94	27.2	75	21.7	62	18
Broken bones (head)	305	88.4	36	10.4	1	0.3	1	0.3	2	0.6
Broken bones (body)	281	81.4	56	16.2	6	1.7	2	0.6	0	0
Dislocations (head)	318	92.2	19	5.5	7	2.0	0	0	1	0.3
Dislocations (body)	271	78.6	57	16.5	15	4.3	2	0.6	0	0
Lacerations (head)	186	53.9	93	27.0	42	12.2	13	3.8	11	3.2
Lacerations (body)	195	56.5	78	22.6	41	11.9	23	6.7	8	2.3
Loss of consciousness	194	56.2	106	30.7	27	7.8	13	3.8	5	1.4
Damage to teeth	275	79.7	60	17.4	5	1.4	2	0.6	3	0.9
Ruptured tympanic membrane	298	86.4	43	12.5	2	0.6	1	0.3	1	0.3
Burns (head)	329	95.4	12	3.5	3	0.9	0	0	1	0.3
Burns (body)	296	85.8	41	11.9	5	1.4	1	0.3	2	0.6
Damage to internal organs <sup>b</sup>	314	91.5	23	6.7	5	1.5	1	0.3	0	0

Note. STD = sexually transmitted disease; Head = head, face, or neck.  
<sup>a</sup>  $n = 344$  due to missing data. <sup>b</sup>  $n = 343$  due to missing data.

Table 3  
Zero-Order Correlations

Variable	M	SD	1	2	3	4	5	6	7	8	9	10
1. PDS	29.28	11.05	1.00									
2. BDI	26.88	11.72	.68**	1.00								
3. PMWI emotional abuse	22.06	6.30	.33**	.28**	1.00							
4. PMWI dominance isolation	19.80	7.16	.35**	.29**	.67**	1.00						
5. CTS-2 physical assault	81.44	69.64	.26**	.24**	.35**	.39**	1.00					
6. Total number acute injuries	4.38	2.61	.31**	.22**	.29**	.37**	.53**	1.00				
7. Length of abuse	4.62	5.39	.15**	.13*	.18**	.12*	.06	.28**	1.00			
8. Length of relationship	.98	.92	.12*	.08	.17**	.12*	.06	.25**	.80**	1.00		
9. Time since left relationship	.30	1.12	.00	-.031	-.03	-.08	-.07	.09	.23**	.07	1.00	
10. Residual injury <sup>a</sup>	—	—	.24**	.15**	.01	.06	.32**	.51**	.13*	.11*	.07	1.00

Note. PDS = Posttraumatic Stress Diagnostic Scale; BDI = Beck Depression Inventory; PMWI = Psychological Maltreatment of Women Inventory; CTS-2 = Revised Conflicts Tactics Scale. Length of abuse, length of relationship, and time since left relationship is calculated by number of years.  
<sup>a</sup> Residual injury is a dichotomous variable with a value of 0 given to those without an appearance-related residual injury and a value of 1 given to those with an appearance-related residual injury. Sample sizes for correlations range from 341–345 depending on some missing data.  
 \*  $p < .05$  (two-tailed). \*\*  $p < .01$  (two-tailed).

All steps were identical in the second regression predicting depression symptom severity. Acute injury severity was not included in the regression as a predictor as it conceptually overlaps with residual injury status given that acute injuries beget residual injuries.

In the first regression, length of abuse and length of relationship explained 2% of the variance in PTSD severity in the first significant step. Both forms of psychological maltreatment and physical assault predicted an additional 14% of variance within the second significant step. Positive residual injury status predicted an additional 2% of variance within the third significant step. Significant, unique predictors of PTSD severity in the final model were positive residual injury status and both forms of psychological maltreatment (see Table 5).

In the second regression, length of abuse predicted 2% of the variance in depression symptom severity in the significant first step. Psychological maltreatment (DI) and physical assault explained an additional 10% of variance within the significant second step. Residual injury status predicted a negligible amount of additional variance in the final step. Significant, unique predictors of depression severity within this final model were the dominance

and isolation subscale of psychological maltreatment and severity of physical assault (see Table 5).

### Exploratory Regressions With Residual Injury Body-Focused Experiences Predicting Symptoms of PTSD and Depression

Exploratory analyses were conducted within the subsample of participants who had a residual injury. A composite score was computed by summing the four items assessing participants' residual injury-focused behaviors and experiences. Two hierarchical multiple regressions were conducted to examine whether residual injury body image concerns were a unique predictor of symptoms of PTSD and depression. The steps of the regression models were identical to the previous models except that total number of acute injuries were added in the second step with the violence characteristics.

In the first regression, length of abuse predicted 1% of the variance in PTSD severity in the first nonsignificant step. Psychological maltreatment (DI), number of acute injuries, and physical assault predicted an additional 23% of variance within the second significant step. Residual injury body image concerns predicted an additional 2% of variance within the third significant step. Significant, unique predictors of PTSD severity in the final model were residual injury body image concerns and the dominance and isolation forms of psychological maltreatment (see Table 6).

In the second regression, length of abuse explained a negligible amount of the variance in depression symptom severity in the nonsignificant first step. Both forms of psychological maltreatment, acute injury, and physical violence severity explained an additional 14% of variance within the significant second step. Residual injury body-focused experiences explained 1% variance in the nonsignificant final step. The significant, unique predictor of depression severity within this final model was the severity of physical assault (see Table 6).

### Discussion

The current study examined the types, frequency, and location of acute and residual injuries within 345 victims of moderate-

Table 4  
Group Differences for Participants With and Without Residual Injury

	Residual injury + ( <i>n</i> = 193)		Residual injury – ( <i>n</i> = 152)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Total number of acute injuries	5.57	2.47	2.88	1.94**
PMWI emotional abuse	23.20	6.14	20.61	6.23**
PMWI dominance isolation	21.23	6.99	17.99	6.98**
CTS-2 physical assault	101.02	74.06	56.70	54.54**
PTSD Diagnostic Scale	31.67	10.38	26.26	11.16**
Beck Depression Inventory	28.42	12.10	24.91	10.94*

Note. PMWI = Psychological Maltreatment of Women Inventory; CTS-2 = Revised Conflicts Tactics Scale. Total number of acute injuries (*n* = 190) due to missing data; CTS-2 (*n* = 192) due to missing data.  
 \*  $p < .01$  (two-tailed). \*\*  $p < .001$  (two-tailed).

Table 5  
*Hierarchical Multiple Regressions Predicting Symptoms of PTSD and Depression Within the Full Sample (N = 343)*

Predictors	B	SE B	$\beta$	sr	R <sup>2</sup>	$\Delta R^2$	$\Delta F$
Predictors of PTSD							
(1) Length of abuse	.00	.00	.15**	.15	.02	.02	7.75**
(2) Length of abuse	.00	.00	.09	.09	.16	.14	18.86**
PMWI emotional abuse	.25	.12	.14*	.10			
PMWI dominance isolation	.31	.11	.20**	.15			
CTS-2 physical assault	.02	.01	.12*	.11			
(3) Length of abuse	.00	.00	.08	.08	.18	.02	6.62*
PMWI emotional abuse	.24	.12	.13*	.10			
PMWI dominance isolation	.29	.11	.19**	.14			
CTS-2 physical assault	.01	.01	.09	.08			
Residual injury	3.02	1.17	.14*	.13			
Predictors of depression							
(1) Length of abuse	.00	.00	.13*	.13	.02	.02	5.63*
(2) Length of abuse	.00	.00	.08	.08	.12	.10	13.32**
PMWI emotional abuse	.23	.13	.13	.09			
PMWI dominance isolation	.24	.12	.14*	.10			
CTS-2 physical assault	.02	.01	.14*	.12			
(3) Length of abuse	.00	.00	.08	.08	.12	.00	.57
PMWI (emotional abuse)	.23	.13	.12	.09			
PMWI dominance isolation	.23	.12	.14*	.10			
CTS-2 Physical assault	.02	.01	.12*	.11			
Residual injury	.97	1.28	.04	.04			

Note. PTSD = posttraumatic stress disorder; PMWI = Psychological Maltreatment of Women Inventory; CTS-2 = Revised Conflicts Tactics Scale.  
 \*  $p < .05$ . \*\*  $p < .01$ .

severe IPV and replicated and extended previous findings from studies examining associations between injury, body image distress, and PTSD (Weaver, Resnick, Kokoska, & Etzel, 2007; Weaver, Turner, et al., 2007). Hypotheses were largely supported in that positive residual injury status was associated with significantly more severe symptoms of PTSD and depression. As a unique predictor, positive residual injury status (and both forms of psychological maltreatment) significantly predicted symptoms of PTSD but not depression above and beyond relationship and abuse characteristics. Within the residual injury group, proxy measures for body image distress and subscales of DI were also unique predictors of symptoms of PTSD (but not depression) above and beyond relationship and abuse characteristics and number of acute injuries. These findings have implications for the role of injury in trauma-related sequelae.

### Acute and Residual Injury

Acute injuries were common, varied, multiple, and frequently delivered to the head, face, or neck. Although bruises, cuts, and fractures are emblematic of the IPV-related injuries frequently treated in emergency departments (e.g., Kyriacou et al., 1999), acute injuries such as damaged teeth and ruptured tympanic membrane may require follow-up care in specialty settings such as oral and maxillofacial surgery and otolaryngology (e.g., Halpern, 2010). Access to health care, generally, and specialty care, specifically, may comprise a significant barrier for female victims of IPV and could ultimately lead to more complicated cosmetic and functional impairments (residual injuries). Further research is needed to explore the interrelationships among appearance and functional effects and the implications of these associations for psychological functioning/recovery.

To our knowledge, this is the first study with a substantial sample size to assess for and report the prevalence of residual injuries in a sample of female victims of IPV. More than half of participants indicated that they had a permanent appearance-related change with some head, face, or neck involvement and nearly one-quarter of these women had more than three. These findings underscore the importance of assessing for the impact of injuries beyond the acute phase. Moreover, positive residual injury status was associated with significantly more severe acute injuries, more severe forms of psychological maltreatment and physical violence and more severe symptoms of PTSD and depression. Given the relationship with multiple severities, it is possible that residual injury may serve as a proxy for severity of exposure and outcome.

Residual injury and both forms of psychological maltreatment were unique predictors of symptoms of PTSD but not depression. Symptoms of PTSD can be triggered by reminders of the traumatic event (American Psychiatric Association, 2000). The residual injury may serve as a tangible representation/reminder of the violence. In partial support of this hypothesis, the majority of participants with a residual injury stated that they had intense memories of the abuse at least once during the last month while looking at the mark or scar. Although researchers have examined and documented physiological reactivity to idiographic trauma triggers (relative to standardized negative or neutral stimuli) in both cross-sectional (Pole, 2007) and longitudinal studies (Ehlers et al., 2010), the use of the mark or scar as an idiographic trigger is as yet unexplored. Future research should include more direct assessments of the functional relationships among residual injuries and symptoms of PTSD, including physiological reactivity. In further support their trauma-related specificity, residual injury status was

Table 6

*Hierarchical Multiple Regressions Predicting Symptoms of PTSD and Depression Within The Residual Injury Subsample (N = 188)*

Predictors	B	SE B	$\beta$	sr	R <sup>2</sup>	$\Delta R^2$	$\Delta F$
Predictors of PTSD							
(1) Length of abuse	.00	.00	.12	.12	.01	.01	2.71
(2) Length of abuse	.00	.00	.02	.02	.24	.23	13.91**
PMWI emotional abuse	.20	.15	.12	.09			
PMWI dominance isolation	.35	.13	.24**	.17			
CTS-2 physical assault	.01	.01	.09	.08			
Total number acute injuries	.89	.33	.21**	.17			
(3) Length of abuse	.00	.00	.03	.03	.26	.02	4.96*
PMWI emotional abuse	.21	.15	.12	.09			
PMWI dominance isolation	.35	.13	.23*	.17			
CTS-2 physical assault	.02	.01	.12	.10			
Total number acute injuries	.64	.34	.15	.12			
Body image distress	.22	.10	.15*	.14			
Predictors of depression							
(1) Length of abuse	.00	.00	.06	.06	.00	.00	.66
(2) Length of abuse	.00	.00	.03	.03	.14	.14	7.46**
PMWI emotional abuse	.30	.19	.15	.11			
PMWI dominance isolation	.29	.17	.17	.12			
CTS-2 physical assault	.02	.01	.15	.13			
Total number acute injuries	.05	.40	.01	.01			
(3) Length of abuse	.00	.00	.04	.03	.15	.01	1.62
PMWI emotional abuse	.30	.19	.15	.11			
PMWI dominance isolation	.29	.17	.16	.12			
CTS-2 physical assault	.03	.01	.16*	.14			
Total number acute injuries	-.12	.43	-.03	-.02			
Body image distress	.16	.12	.09	.09			

Note. PTSD = posttraumatic stress disorder; PMWI = Psychological Maltreatment of Women Inventory; CTS-2 = Revised Conflicts Tactics Scale.  
\*  $p < .05$ . \*\*  $p < .01$ .

not a unique predictor of symptoms of depression. The role of psychological maltreatment as a unique predictor of PTSD underscores the complex role that controlling and surveillance behaviors may play in association with threat, fear, and PTSD and the possibility that the unrelenting nature of emotional abuse may further complicate trauma-related outcomes. Clearly, these findings require further replication with other samples of victims of IPV as well as victims of other types of injury, including combat veterans as well as accident victims.

### Body-Focused Behaviors and Body Image Distress

Nearly half of participants who were positive for residual injury reported experiencing emotional distress when thinking about their residual injuries on many days each month. A smaller though substantial percentage of the sample (~25%) also reported engaging in residual injury-related avoidance. Body-focused re-experiencing and avoidance overlaps with the topography of triggered PTSD re-experiencing and avoidance. Notably, the composite score of body-focused behaviors and psychological maltreatment (DI) was a unique predictor of PTSD, after controlling for abuse and relationship characteristics. If these findings continue to be replicated, further theoretical and empirical work is needed to explore the interconnections among body image distress and PTSD for those with violence-related residual injuries. Specifically, it may be important to consider whether these body image concerns are manifestations of PTSD or whether body image distress is another form of trauma-related sequelae. Either implication would suggest that more detailed assessments for

body-focused experiences/behaviors are needed when assessing those with violence-related injuries.

### Limitations, Conclusions and Future Directions

The current study has a number of limitations. First, acute and residual injuries were assessed using self-report and their frequency was estimated. Estimating events, particularly those that may be frequent, is difficult without strategies such as shorter reference periods and recall cues (Schwarz & Oyserman, 2001). In addition, the body image concerns were only asked of participants with a residual injury, so comparisons could not be made with those who were residual injury negative. Not only were body image concerns exclusively assessed within the residual injury group but they were asked using only a select number of questions, thus lacking the breadth and depth of a more comprehensive assessment. Finally, although the sample was intentionally selected as a moderately to severely violence-exposed group of female victims, current findings may not generalize to those with lower levels of violence exposure.

IPV-related residual injuries may serve as tangible reminders of the physical violence as demonstrated by their unique association with PTSD and reports of triggered memories, distress when seeing them, and avoidance. Future research should continue to explore the role of residual injury in shaping and/or maintaining PTSD and to disentangle the intertwined effects of acute and residual injury. Additional components of residual injury including body image distress also warrant further study as a possible form of posttraumatic sequelae.

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