

Intimate Partner Abuse and PTSD Symptomatology: Examining Mediators and Moderators of the Abuse–Trauma Link

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Posttraumatic stress disorder (PTSD) has been linked to intimate partner abuse, physiological reactivity, and social support. The authors used structural equation modeling to test social support as a moderator and psychophysiological reactivity and anger as mediators of the relation between abuse and traumatic symptoms among a sample of women reporting psychological abuse, including women reporting both physical violence and no physical violence. Both physical and psychological abuse were related to PTSD symptoms. Whereas physical and psychological abuse were highly correlated, psychological abuse did not predict PTSD symptomatology over and above the effect due to physical assault. Psychophysiological reactivity and anger and fear displayed during an argument with the partner did not mediate the abuse–trauma link. Social support moderated the relation between psychological abuse and PTSD symptomatology.

Keywords: family violence, PTSD, physiological arousal, social support, structural equation modeling

The past 30 years have seen a dramatic increase in clinical and research attention directed toward intimate partner abuse. Physical partner violence has been shown to have wide-ranging negative consequences, including depression (Campbell, 1989), anxiety (Russell, Lipov, Phillips, & White, 1989), social withdrawal (Star, Clark, Goetz, & O'Malia, 1979), suicide attempts (Gelles & Harrop, 1989), and posttraumatic stress disorder (PTSD). In their review of PTSD and domestic violence, Jones, Hughes, and Unterstaller (2001) found the degree to which PTSD symptoms were experienced was related to the extent, severity, and type of abuse. Not all battered women experience PTSD symptoms. Severe violence, although it exacerbates the symptoms, need not necessarily be experienced for the victim to develop PTSD (Cascardi & O'Leary, 1992; Jones et al., 2001; Rollstin & Kern, 1998). Women may differ in the extent to which they evidence PTSD symptoms, depending on the type of abuse experienced, the context of their

social support network, and their individual ability to regulate their own emotional responses.

Psychological Abuse

In the study of intimate partner violence (IPV), less clinical and research attention has been given to psychological abuse than physical abuse, despite the fact that physical abuse rarely occurs without psychological abuse (Marshall, 1996). Psychological abuse has been defined as “verbal and nonverbal acts which symbolically hurt the other, or the use of threats to hurt the other” (Straus, 1979, p. 77). As few as 1% of abused women experience physical violence in the absence of psychological abuse (Follingstad, Rutledge, Berg, Hause, & Polek, 1990), although psychological abuse without physical violence is common among distressed relationships. Psychological abuse has been shown to be related to depression, problem drinking (Arias, Street, & Brody, 1996), and chronic illness (Marshall, 1996), as well as PTSD symptomatology (Arias & Pape, 1999; Jones et al., 2001).

Given the high comorbidity between physical and psychological abuse, it is difficult to assess the relative impact of each type of abuse on PTSD symptoms in victims of domestic violence. Victims have been found to report that psychological abuse has a more negative impact on their emotional well-being than does physical abuse (e.g., Follingstad et al., 1990; Walker, 1979). Previous studies that have tried to parcel out these effects have found that psychological abuse is a unique, statistically significant predictor of trauma symptoms, over and above the effects due to

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This project was funded by Grant R03 MH066943-01A1 from the National Institutes of Health and by the University of Houston.

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physical abuse (Arias & Pape, 1999; Kahn, Welch, & Zillmer, 1993; Street & Arias, 2001; Taft, Murphy, King, Dedeyn, & Musser, 2005). However, few studies have had sufficient sample size and range of abuse scores to adequately test this phenomenon.

Social Support

Empirically, protective factors that buffer individuals tend to account for more of the variance in posttraumatic stress than do negative risk indicators (Astin, Lawrence, & Foy, 1993). Several researchers (Coker et al. 2002; Jones et al., 2001; Mertin & Mohr, 2001) have suggested that social support is one such protective factor that serves to reduce the risk of adverse mental health outcomes among domestic violence victims. Lack of social support has been found to be predictive of PTSD, anxiety, and depression 1 year after leaving a battered-women shelter (Mertin & Mohr, 2001). Situational variables or conditions that buffer risk are generally thought to be moderators (Baron & Kenny, 1986). Therefore, social support should function as a moderator of the link between intimate partner abuse and PTSD symptoms. If social support functions as a moderator, abuse would predict PTSD more strongly in cases where there is low social support than in cases of high social support.

Physiological Reactivity

Another possible mechanism by which abuse affects PTSD symptoms may be physiological reactivity. Individuals with PTSD produce heightened physiological responses to stimuli related to their traumatic event (Orr & Roth, 2000). For example, heightened physiological reactivity to trauma-related stimuli has been found for those traumatized by military combat in Vietnam (Pitman, Orr, Foa, de Jong, & Claiborn, 1987), Korea, and World War II (Orr, Pitman, Lasko, & Herz, 1993); varied civilian events in Israel (Shalev, Orr, & Pitman, 1993); childhood sexual abuse (Orr et al., 1988); and motor vehicle accidents (Blanchard et al., 1996; Bryant, Harvey, Cuthrie, & Moulds, 2003).

Physiological activation in response to trauma has been shown to mediate the development of PTSD (Bryant et al., 2003). Cues reminiscent of the traumatic event evoke powerful emotions such as fear and helplessness, with concomitant heightened psychophysiological arousal (Orr, 1994). Although physiology researchers have studied car accident and rape victims (Blanchard et al., 1996; Orr et al., 1988), only a few studies have examined physiological reactivity among victims of IPV. One study (Jacobson et al., 1994) found that battered women simultaneously exhibit fear and sadness with heightened cardiovascular arousal during a conflict discussion with the abusive partner (Jacobson et al., 1994). Another found that battered women reporting PTSD symptoms showed a decreased startle response (Medina, Mejia, Schell, Dawson, & Margolin, 2001). This finding is inconsistent with previous research, as an augmented startle response and heightened physiological reactivity are associated with PTSD (e.g., Shalev, Orr, Peri, Schreiber, &

Pitman, 1992). One reason for these paradoxical findings could be that the laboratory task employed was unrelated to intimate partner abuse and may not have been emotionally salient.

Anger and Fear

Emotional reactions in response to the laboratory tasks could affect psychophysiological reactivity. In addition, battered women who are fearful of their abusive partner may be more likely to develop PTSD given that fear is central to this anxiety disorder. Elevated anxiety and anger have been reported among battered women (Campbell, 2002; Koss, 1990; Jacobson et al., 1994), and anxiety has been found to mediate the relation between partner aggression and physical health (Sutherland, Bybee, & Sullivan, 1998). More recently, anger but not anxiety has been found to partially mediate the relation between poor health and PTSD among battered women (Taft, Vogt, Mechanic, & Resick, 2007). Although no studies have tested anger or fear as mediators of the abuse–trauma link, it is possible that living in an abusive home leads to chronic levels of fear and anger, which lead to autonomic nervous system dysregulation (Sirois & Burg, 2003) and, in turn, to PTSD.

In the current study, we assessed physiological reactivity of female victims of physical or psychological abuse, specifically changes in skin conductance (sweating), heart rate, and skin temperature, while engaged in a conflict discussion with their partner. We hypothesized that repeated exposure to IPV leads to increased physiological reactivity when presented with fear-relevant cues, such as verbal conflict with the abuser. Because skin temperature decreases and skin conductance increases have been associated with fear and increased heart rate with anger (Levenson, 1992), we also examined women's displays of fear and anger during the conflict discussion.

The current study proposes a model of physical abuse, psychological abuse, physiological reactivity, anger, fear, and social support as they relate to PTSD symptomatology. We expected physical and psychological abuse to show direct effects on PTSD symptoms. We also expected that psychological abuse would predict PTSD symptoms over and above the effects of physical abuse. Social support was expected to function as a moderator and psychophysiological reactivity, anger, and fear as mediators of the abuse–trauma link. Physiological reactivity may serve as an indicator of participants' emotional responses to the perpetrator, which may influence her experience of anxiety symptoms. In addition, levels of social support may help explain why some intimate partner abuse victims evidence PTSD symptoms, whereas others do not.

Method

Participants

Couples ($N = 202$) were recruited for the current study as part of a larger project (Costa & Babcock, in press; Costa, Canady, & Babcock, 2007). Participants responded to local

newspaper advertisements and fliers recruiting “couples experiencing conflict.” Inclusion criteria included that participants report being married or living together for at least 6 months, be 18 years of age or older, and able to speak and write English proficiently. Female partners were contacted by phone and administered the Violence subscale of the Conflict Tactics Scale (Straus, 1979). To meet study criteria, female partners had to report over the phone at least one incident of male-to-female aggression in the past year. Participants denying a history of physical abuse but endorsing relationship unhappiness (Goodwin, 1992) were also included. Although this group reported no physical violence, all women reported that their male partner perpetrated some psychological abuse in the past year. Men came in alone for the initial assessment. Men and women came in together for the second assessment. Each participant was paid \$10 per hour for his or her participation.

Procedure

Data were collected during the second assessment period lasting approximately 3.5 hr. Couples were separated, asked to complete a series of questionnaires, and then reunited to participate in a conflict discussion. Research assistants connected psychophysiological recording devices to both partners and then administered the Play-by-Play Interview (Hooven, Rushe & Gottman, 1996) to clarify the two worst areas of conflict area in their relationship. In this interview, couples independently rank how much difficulty they experience across 10 areas common to marital discord on a scale of 0 to 100. The interviewer probes on the highest rated items to find unresolved, emotionally laden issues. Couples were then asked to sit quietly for a 4-min eyes-open baseline, then to engage in a 7.5-min conflict discussion with their intimate partner. In no cases did these conflict discussions become violent, although many couples frequently became psychologically abusive to one another (e.g., swearing, yelling, etc.).

Safety Measures

Safety procedures developed by Anne Ganley were applied here (Babcock, Green, Webb, & Yerington, 2005; Jacobson et al., 1994). Following the assessment, each participant was debriefed separately to assess danger and safety. Safety plans were developed if needed. All participants were given referrals for community resources including, but not limited to, counseling services and shelters. Female participants were telephoned 1 week later to assess whether their participation caused any untoward events. In no cases did women report any subsequent violence due to participation in the laboratory assessments.

Questionnaire Measures

Physical assault. The Revised Conflict Tactics Scale (CTS2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996) was administered to male and female participants separately to assess the type, severity, and frequency of IPV. The

CTS2 is a 78-item questionnaire that assesses the frequency of physically, sexually, and psychologically abusive acts that have occurred in the past year. For the current study, only the men’s perpetration of Minor (5 items) and Severe (7 items) Physical Assault subscales were used. Preliminary internal consistencies of the CTS2 range from .79 to .95 (Straus et al., 1996). In this sample, the internal consistencies of the men’s report of his own minor physical and severe physical assault were $\alpha = .88$ and $.58$, respectively. For women’s report of men’s physical violence, alphas were $.82$ for minor and $.76$ for severe physical assault. The four physical assault scales were expected to be indicators of a single latent variable. This assumption was tested by analyzing a measurement model in MPlus (Muthén & Muthén, 2002). The physical assault construct on men’s and women’s report of men’s minor and severe violence as independent manifest variables demonstrated an inadequate fit, $\chi^2(2, N = 201) = 110.07, p < .01$; comparative fit index (CFI) = 0.73; parsimonious comparative fit index (PCFI) = 0.24; root-mean-square error of approximation (RMSEA) = 0.52. Modification indices suggest allowing the error variance of men’s reports of violence to covary. This one modification resulted in an excellent fit to the data, $\chi^2(1, N = 201) = 0.25, ns$; CFI = 1.00; PCFI = 0.10; RMSEA = 0.00.

Psychological abuse. The Emotional Abuse Scale (Murphy & Hoover, 1999) was administered to female participants to measure psychological abuse. The Emotional Abuse Scale is a 54-item measure measuring four types of psychological abuse and controlling behavior. Internal consistencies in the current sample were $.83$ for Restrictive Engulfment, $.86$ for Hostile Withdrawal, $.87$ for Denigration, and $.90$ for Dominance/Isolation. These four scales were entered into a measurement model, which yielded acceptable fit: $\chi^2(2, N = 201) = 4.55, ns$; CFI = 0.98; PCFI = 0.20; RMSEA = 0.08.

Social support. The Interpersonal Support Evaluation List (Cohen & Hoberman, 1983) was administered to the female participants to assess perceived availability of four types of social support: tangible, appraisal, self-esteem, and belonging. The Interpersonal Support Evaluation List is a 48-item, true–false questionnaire designed to assess the perceived availability of social support. The current study used the total scale score as a measure of social support; internal consistency was $\alpha = .92$ in this sample.

PTSD symptoms. The Posttraumatic Diagnostic Scale (PDS; Foa & Cashman, 1997) was used to assess PTSD symptomatology in the female participants. The PDS is a self-report measure designed to yield a PTSD diagnosis according to the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; American Psychiatric Association, 1994) and a continuous measure of PTSD symptom severity for each of three symptom clusters: reexperiencing $\alpha = .84$, avoidance $\alpha = .88$, and arousal $\alpha = .86$. Participants must endorse that they have experienced one or more traumatic events, such as a serious accident, life-threatening illness, sexual assault, or nonsexual assault, to receive a score greater than zero on the subscales or a diagnosis. Dichotomous PTSD diagnostic status (0 = no; 1 = yes) was also

entered into the structural equation model to avoid multicollinearity among the severity subscales. This measurement model of the four PTSD indices yielded adequate fit: $\chi^2(2, N = 201) = 5.49, ns$; CFI = 0.99; PCFI = 0.33; RMSEA = 0.09. Note that all PDS scores were entered, regardless of the nature of the traumatic event(s). Traumatic events were not restricted to the experience of IPV.

Relationship satisfaction. The 32-item Dyadic Adjustment Scale (Spanier, 1976) was administered to men and women in the lab to assess relationship satisfaction; $\alpha = .93$ for the current study. This scale was administered for descriptive purposes only.

Physiological Measures

Physiological measures were collected using the James Long Company system 16-channel burst mode bioamplifier. Men's¹ and women's respiration, heart rate, skin conductance, finger pulse, ear pulse, finger temperature, and movement were continuously measured during the conflict task. Three physiological variables were used in this study. Heart rate was measured by placing three, pre-gelled, 30-mm square Unitrace, alligator-clip type electrodes on the subjects' chests to collect interbeat interval transformed into second-by-second heart rate (in beats per minute). An increase in heart rate generally indicates increased arousal, caused by alpha- and beta-adrenergic activation or by parasympathetic (vagal) inhibition.

Skin conductance level (was measured via two electrodes placed on the volar surfaces on the distal phalanges of the first and third finger of the nondominant hand using Ag/AgCl electrodes. Skin conductance reactivity (in microsiemens) assesses electrodermal activity, or changes in the secretion of sweat glands. Skin conductance is a relatively pure index of sympathetic activation as the sweat glands are innervated predominantly by the sympathetic nervous system.

Finger temperature was measured via a thermocouple transducer on the palmar tissue of the distal phalange of the fourth finger of the nondominant hand. Finger temperature was chosen as a measure of physiological reactivity as it has been shown to be a physiological marker of fear. Three change scores for the three channels were calculated as the mean rating during the conflict discussion minus the mean during the baseline. A measurement model tested whether the psychophysiological variables represented one latent variable of psychophysiological reactivity. Weighted only by skin conductance, this measurement model failed. Therefore, heart rate, skin conductance, and skin temperature change were analyzed as separate manifest variables.

Observational Measures of Affect

To better understand the meaning of women's psychophysiological responding, their emotional displays during the conflict discussion were examined. A team of four trained coders coded the videotaped arguments using the Specific Affect Coding System (SPAFF; Gottman, McCoy, Coan, & Collier, 1996). SPAFF categorizes 16 emotions on

the basis of facial affect, vocal tone, body language, and content of speech. For purposes of this study, only women's displays of fear and anger were examined. Videotapes of the conflict discussion were coded on a second-by-second basis using the Video Coding Station (Long, 1998). Codes are reported in percentage of the total time fear or anger was displayed. Twenty-five percent of the tapes were coded by a second coder to calculate reliability. Average kappas for fear and anger were 0.75 and 0.70, respectively.

Results

Demographics

The majority of this community sample was African American (45.95%), the average age was 30 years, and the average length of relationship was 4.5 years. There were few demographic differences between women reporting some male-to-female violence in the past year (IPV, $n = 163$) and those reporting relationship distress, psychological abuse, but no physical violence ($n = 39$; see Table 1). However, women reporting psychological abuse reported a significantly higher income than IPV women, $t(200) = 2.06, p < .05$. Psychologically abused women also reported higher relationship satisfaction than IPV women, $t(200) = 3.18, p < .01$.

Table 2 compares women who reported IPV with those who reported psychological abuse only on the variables to be tested in the models. As expected, women in violent relationships reported more physical and psychological abuse, reported lower levels of social support, and showed a greater drop in finger temperature when they argued with their abusive partners. Women reporting physical intimate partner violence ($n = 40, 28.2\%$) were significantly more likely to meet criteria for PTSD than psychologically abused women ($n = 4, 10.8\%$), $\chi^2(1, N = 201) = 4.12, p < .05$.

Correlations

Both the physical assault and psychological abuse subscales were positively skewed, as they are both based on frequency count data. A square root transformation was performed to help normalize the distribution of these variables. Results of all subsequent analyses use the transformed physical and psychological abuse variables.² Pearson correlations between the variables were examined across the entire sample. To reduce the size of the correlation matrix, we present the correlation between the factor scores of the latent variables computed in MPlus with the manifest variables in Table 3. As expected, male-to-female

¹ Although men's physiological reactivity was collected simultaneously, it is beyond the scope of this article. See Babcock et al. (2005) for men's psychophysiological responding as it relates to antisocial behavior and IPV.

² The pattern of results does not change substantially if raw Conflict Tactics Scale and Emotional Abuse Scale scores are used in place of square root transformed scores.

Table 1
Demographic Differences Between Psychologically Abused (PA) and Intimate Partner Violent (IPV) Women

Variable	PA (n = 37)	IPV (n = 165)	F(1, 200) or χ^2 (1, N = 201)
Mean (SD) age (years)	31.16 (9.06)	29.70 (9.00)	0.80
Education (%)			
No college	18.92	43.14	7.39**
Some college	81.08	56.86	
Married (%)	51.4	39.6	1.62
Mean (SD) length of relationship (years)	5.67 (6.33)	4.29 (4.11)	2.56
Mean (SD) income (\$)	38,292 (21,987)	31,434 (34,354)	1.35
Mean (SD) marital satisfaction	110.76 (18.33)	98.83 (22.08)	10.12**

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

physical assault frequency was positively correlated with psychological abuse and PTSD symptoms and negatively related to skin temperature change and social support. Psychological abuse was negatively correlated with social support and positively correlated with PTSD symptoms. Skin temperature change was the only psychophysiological channel to show significant simple correlations with the other

variables of interest. It was negatively correlated with physical assault and positively correlated with social support, as expected, but was unrelated to psychological abuse and PTSD symptoms. Women’s anger, but not fear displays, was correlated with physical abuse. Although we predicted that decreases in finger temperature would be indicative of fear, finger temperature change was correlated negatively with anger. Low social support was highly correlated to PTSD diagnostic status in a point biserial correlation, $r = .43, p < .001$.

Structural Equation Models

To replicate findings that psychological abuse predicts PTSD symptoms over and above the effects of physical abuse (Arias & Pape, 1999; Taft et al., 2005), we examined the direct and indirect relations between physical assault and psychological abuse and PTSD symptoms. Three latent variables, physical assault, psychological abuse, and PTSD symptoms, were entered into Mplus. Psychological abuse and physical assault were allowed to covary. Fit indices suggest adequate fit, $\chi^2(50, N = 201) = 70.421, p = 1.41$; CFI = 0.98, PCFI = 0.74, RMSEA = 0.045. Examining the standardized path coefficients, all manifest variables continued to load significantly on the latent variables, (all $B_s > 0.51$). Physical assault and psychological abuse constructs were highly correlated ($r = .56, p < .001$). Examination of the direct effects of abuse on PTSD suggests that physical

Table 2
Differences Between Psychologically Abusive (PA) and Intimate Partner Violent (IPV) Couples on Observed Variables

Variable	PA (n = 37)		IPV (n = 165)		F(1, 200) or χ^2 (1, N = 201)
Males’ physical abuse					
Mean (SD) males’ report severe	0.00	(0.00)	3.48	(7.09)	7.17**
Range	0.00–0.00		0.00–52.00		
Mean (SD) females’ report severe	0.00	(0.00)	4.54	(8.47)	10.61***
Range	0.00–0.00		0.00–61.00		
Mean (SD) males’ report minor	0.00	(0.00)	11.19	(19.15)	12.59***
Range	0.00–0.00		0.00–125.00		
Mean (SD) females’ report minor	0.00	(0.00)	11.38	(14.54)	22.57***
Range	0.00–0.00		0.00–81.00		
Mean (SD) males’ psychological abuse					
Mean (SD) restrictive engulfment	13.54	(10.83)	19.25	(11.84)	7.30**
Mean (SD) denigration	5.00	(7.22)	12.69	(11.81)	14.44***
Mean (SD) hostile withdrawal	13.41	(8.84)	18.32	(10.54)	6.93**
Mean (SD) dominance/isolation	1.73	(4.19)	13.44	(13.21)	28.31***
Mean (SD) psychophysiological reactivity					
Skin conductance change	0.65	(0.73)	0.86	(0.82)	2.15
Heart rate change	3.46	(3.02)	4.35	(5.00)	1.08
Finger temperature change	0.46	(0.98)	–0.03	(1.19)	5.31*
Mean (SD) observed affect					
Anger	0.26	(0.68)	0.66	(1.94)	1.58
Fear	1.14	(2.34)	0.98	(1.50)	0.59
Mean (SD) social support	34.76	(4.23)	29.24	(8.06)	16.31***
Mean (SD) PTSD symptoms					
Reexperiencing	2.87	(2.19)	3.78	(3.39)	2.45
Avoidance	4.08	(4.10)	4.80	(4.80)	0.70
Arousal	3.71	(3.34)	4.08	(3.72)	0.32
Diagnosis (%)	10.8		28.2		4.12*

Note. PTSD = posttraumatic stress disorder.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3
Correlations Among Latent Factors and Possible Mediator and Moderator Variables

Variable	Psychological abuse	Heart rate change	Skin conductance change	Finger temperature change	Anger	Fear	Social support	PTSD
1. Physical abuse	.63	-.01	.05	-.18**	.29***	-.11	-.37***	.42***
2. Psychological abuse	—	.02	.05	-.07	.10	-.05	-.25**	.29***
3. Heart rate change		—	.10	.06	-.13**	.06	.08	-.09
4. Skin conductance change			—	-.08	-.03	.18***	-.05	.08
5. Finger temperature change				—	-.15**	.04	.19**	-.01
6. Anger					—	-.10	-.19**	.19**
7. Fear						—	.08	-.08
8. Social support							—	-.49***
9. PTSD								—

Note. PTSD = posttraumatic stress disorder.

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

assault reliably predicts PTSD symptoms ($B = 0.33$, $p < .001$), whereas psychological abuse does not ($B = 0.07$, ns).

Next, the hypothesized moderators and mediators were tested in three separate models. Mediators were tested only on significant pathways and moderators on nonsignificant pathways in the model described above. Because the path between psychological abuse and PTSD symptoms was not significant, a moderator may be obscuring that effect. Therefore, social support was tested as a moderator of the nonsignificant psychological abuse–trauma pathway by entering the interaction term (Interpersonal Support Evaluation List score \times Psychological Abuse latent variable) in MPlus. The interaction between social support and psychological abuse was significant ($b = -0.09$; 95% confidence interval = -0.15 , -0.03). Conducting a median split on social support revealed that psychological abuse correlates with PTSD symptoms for those low in social support ($r = .20$, $p < .05$) but not for those high in social support ($r = .09$, ns).

Finger temperature change was tested as a mediator of the significant physical abuse–PTSD symptoms link in a separate model testing direct and indirect effects. Whereas finger temperature change was related to physical abuse ($B = -0.19$, $p < .05$), the pathway between finger temperature change and PTSD was not significant ($B = 0.08$, ns). The direct effect of physical abuse and PTSD symptoms remained significant ($B = 0.37$, $p < .001$). Examining the raw change scores suggests that finger temperature for many women actually decreased below baseline. Although decreased finger temperature was related to having experienced more physical abuse in the past year, it was not related to PTSD symptoms. Therefore, finger temperature does not mediate the physical abuse–trauma relation. Because anger and not fear were found to be related to physical abuse and PTSD symptoms (see Table 3), we tested anger as a mediator of this pathway. As with finger temperature change, the pathway between anger and physical abuse was significant ($B = 0.19$, $p < .05$), but the pathway between anger and PTSD symptoms was not ($B = 0.14$, $p < .10$), and the pathway between physical abuse and PTSD symptoms remained significant ($B = 0.34$, $p < .001$). Thus,

neither anger nor finger temperature functioned as a mediator of the physical abuse–trauma link.

Discussion

In this study, we tested several models of PTSD symptomatology in a sample of women experiencing a range of psychological and physical abuse. As expected, both physical and psychological abuse were related positively to PTSD symptomatology; however, psychological abuse did not predict PTSD symptoms over and above that attributable to physical violence, as previous studies have found. This could be because the effects of psychological abuse on PTSD symptoms were obscured by an important moderator. Social support moderated the relation between psychological abuse and PTSD symptoms, as psychological abuse predicted PTSD symptoms only in the condition of low social support. Although we hypothesized that psychophysiological reactivity and concomitant emotional displays would function as mediators of the robust effects of physical abuse on PTSD symptoms, there was no support that psychophysiological reactivity, anger, or fear displayed during a conflict discussion with the abusive partner mediated the abuse–trauma link.

Physical and psychological abuse repeatedly have been shown to be associated with PTSD symptoms (Jones et al., 2001), and thus both were expected to significantly predict trauma symptoms. Although previous studies have found psychological abuse to be related to PTSD symptoms even after controlling for the effects of comorbid physical abuse (Arias & Pape, 1999; Basile, Arias, & Desai, 2004; Taft et al., 2005), in the current study psychological abuse failed to show a significant direct effect in predicting PTSD symptomatology when physical abuse was taken into account. Differences between the current study and previous ones include methodology and sampling strategy. First, this is the first study to employ structural equation modeling to address the shared and unique variance of psychological and physical abuse. Second, the current study recruited a community sample selected for couples experiencing violence or psychological abuse. Previous studies used shelter sam-

ples (Arias & Pape, 1999), partners of men in a batterers' treatment program (Taft et al., 2005), or nationally representative samples (Basile et al., 2004). Studies using severely battered women (e.g., shelter samples) may be more likely to find independent effects due to psychological abuse because of range restrictions of physical abuse, thereby limiting the amount of variance for which physical abuse can account. In addition, this relation appeared to be obscured by at least one moderator, namely social support.

Social Support

A further goal of the current study was to explain the mechanisms behind the abuse–PTSD relations. Social support does appear to moderate the relation between psychological abuse and PTSD symptoms. That is, psychological abuse appears to predict PTSD symptoms in the presence of low but not high levels of social support. Women who are denigrated, isolated, or restricted by their partners may be buffered from developing PTSD symptoms when they are supported by other family members or friends. Women who are emotionally abused without such a social support network may be at higher risk of developing an anxiety disorder. Psychological abuse may also directly decrease social support given that isolation is one form of psychological abuse. Psychological abuse may also influence the perception of social support, and this perception, in turn, influences the development of PTSD symptoms (Tarrier & Humphreys, 2004).

Physiological and Emotional Reactivity During Conflict

Because individuals with PTSD display heightened physiological responses to stimuli related to their traumatic event (Orr & Roth, 2000), we also tested psychophysiological reactivity as a mediator of the robust physical abuse–trauma link. Unlike previous studies exposing individuals with PTSD to stimuli related to their traumatic event (Blanchard et al., 1996; Shalev et al., 1993), in the present study, PTSD symptoms were not related to heighten psychophysiological arousal. Although psychophysiological reactivity was related to the women's emotions expressed during the conflict discussion, there was no evidence that women with greater PTSD symptoms were more psychophysiological reactive.

Because physiological activation in response to the conflict discussion was not related to PTSD symptoms, it could not function as a mediator of the abuse–trauma link. Only women's decreased finger temperature from baseline to the conflict discussion with the abusive partner was related to abuse. Although we expected finger temperature to be an index of fear, it appears rather to reflect women's anger displays during the conflict discussion. Women who had experienced more physical abuse tended to become both angrier and cooler in their surface temperature during the observed argument. This is in keeping with previous research on battered women showing that anger, not fear, was the predominant emotion expressed when arguing with their

abuser in a laboratory setting (Jacobson et al., 1994). Increased skin conductance change was associated with fear displays, as would be expected, but surprisingly, anger, not fear, was associated with PTSD symptoms. Whereas stereotypes portray the fearful, timid, traumatized type of battered woman, our findings, like those of Jacobson et al. (1994), suggest that the more severely battered, severely traumatized women tend to be angrier at their mates. Other researchers have also found anger among women experiencing partner abuse to be implicated in PTSD (Taft et al., 2007). The psychosocial vulnerability model hypothesizes both lower levels of social support and more stressful life events among those experiencing problems with anger (Smith, 1992). The direction of causality of these related problems remains an empirical question.

There are many reasons why psychophysiological reactivity did not function as a mediator. Although the task was an actual conflict discussion with the abusive partner, partner abuse may not have been the primary source of their PTSD symptoms as the PDS can assess reactions to multiple traumatic events. It is likely that the psychophysiological responding of battered women is highly dependent on their own immediate feelings and their partner's immediate behavior. Method variance may also hinder attempts to find psychophysiological mechanisms in the development of traumatic symptoms. It is also possible that physiological reactivity mediates the relation between physical abuse and PTSD symptomatology for only subgroups of IPV women, that is, that this mediator is moderated by other variables, such as PTSD diagnosis or dissociative tendencies. Dissociation tends to lead to suppressed autonomic arousal (Griffin, Resick, & Mechanic, 1997) and emotional displays. In addition, dissociation is thought to be more prevalent as a coping strategy in response to chronic stressors (Medina et al., 2001), such as domestic abuse. Although psychophysiological reactivity may not be causally related to the development of PTSD among battered women, it does appear to be relevant in understanding the emotional responses of abused women.

Study Contributions and Limitations

A strength of this study was its use of multiple scales, collateral report, and naturalistic conflict discussion to elicit psychophysiological reactivity. Many models capitalize on shared method variance by entering only a single respondent's self-report variables. In the current study, psychophysiological reactivity and affect were elicited by an *in vivo* argument. Although this is a trauma-relevant task, future studies may consider assessing psychophysiological responding during more standardized, IPV-relevant cues, such as short films or scripts depicting intimate partner abuse.

This model tested only three possible mechanisms operating on abuse and PTSD symptoms. Numerous variables besides social support and physiological reactivity play a role in the abuse–mental health relation. For example, social support as it relates to mental health may be moderated by other variables, such as coping or attributional style (Senior,

2003), and may be different for women of different ethnicities or levels of socioeconomic status (Kocot & Goodman, 2003). This study was limited by the use of a cross-sectional design. Because all measures were collected at one time point, drawing any conclusions about the causality or sequential development of PTSD is prevented. For example, the cause of the PTSD symptoms was not limited to IPV, and the extent to which PTSD symptomatology may have existed prior to the onset of physical or psychological abuse is unknown. The direction of causality cannot be established by the current study. Women experiencing psychological symptoms may be more likely to be involved in abusive relationships. Similarly, a lack of social support may lead some women to settle for abusive mates. Although this cross-sectional study collected data with different time frames (i.e., the CTS2 records violence experienced in the past year, whereas the PDS measures trauma symptoms experienced in the past month), only longitudinal research can assess the development of PTSD symptoms over time.

The community sample can be seen as both a limitation and strength of the study. Whereas the majority of research on victims of domestic violence has been conducted in battered-women shelters, the current sample is a community sample of women in various stages of their relationships, experiencing various forms and degrees of abuse. In nationally representative samples, only 4% to 12% of trauma victims meet diagnostic criteria for PTSD (Kessler et al., 1995; Kilpatrick et al., 2003; Resnick et al., 1993). Thus, the proportion of women in this community sample of couples experiencing conflict who met criteria for PTSD (22%) is relatively high. Similarly, the level of physical abuse (averaging, 15 male-to-female violent acts in the past year) is high compared with other community samples. Nonetheless, the effect sizes are relatively small. This sample is predominantly of low socioeconomic status, African American, and selected for relationship problems. Although the majority of this nonrepresentative sample experienced physical abuse in the past year, data from women who were in psychologically abusive but nonviolent relationships were also included. Caution should be taken in generalizing results from the current study to a treatment-seeking population.

Conclusions

Abusive intimate relationships are known to harm the mental health of the victims. The goal now is to determine how IPV operates in relation to mental health, as well as searching for variables that may protect against the harmful effects of IPV. In examining the relation between IPV and mental health, previous studies have considered different (a) types of abuse (Arias & Pape, 1999), (b) environmental and contextual factors (Coker, Watkins, Smith, & Brandt, 2003), or (c) intrapersonal variables (Clements & Sawhney, 2000). The current study proposed a model incorporating variables at all three levels in an attempt to explore why not all abused women experience PTSD symptoms. Although both physical and psychological abuse are risk factors for PTSD symptoms, physical abuse accounted for more of the

variance in traumatic symptoms. This is not to say that psychological abuse is not harmful. Psychological abuse was related to PTSD symptoms, especially in conditions of women's low social support. When given a safe environment in which to express her feelings to her partner, a battered woman may appear more angry than afraid. This should not deem her any less sympathetic as a victim or in less need of trauma treatment. Clinically, these findings suggest a global approach to the treatment of domestic violence victims in which the simultaneous effects of physical abuse and psychological abuse are addressed and efforts are made to increase the quality of social support available to the victim.

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Received August 11, 2006

Revision received January 31, 2008

Accepted February 1, 2008 ■

Call for Nominations: *Psychology of Violence*

The Publications and Communications (P&C) Board of the American Psychological Association has opened nominations for the editorship of *Psychology of Violence*, for the years 2011–2016. The editor search committee is chaired by William Howell, PhD.

Psychology of Violence, to begin publishing in 2011, is a multidisciplinary research journal devoted to violence and extreme aggression, including identifying the causes and consequences of violence from a psychological framework, finding ways to prevent or reduce violence, and developing practical interventions and treatments.

As a multidisciplinary forum, *Psychology of Violence* recognizes that all forms of violence and aggression are interconnected and require cross-cutting work that incorporates research from psychology, public health, neuroscience, sociology, medicine, and other related behavioral and social sciences. Research areas of interest include murder, sexual violence, youth violence, inpatient aggression against staff, suicide, child maltreatment, bullying, intimate partner violence, international violence, and prevention efforts.

Editorial candidates should be members of APA and should be available to start receiving manuscripts in early 2010 to prepare for issues published in 2011. Please note that the P&C Board encourages participation by members of underrepresented groups in the publication process and would particularly welcome such nominees. Self-nominations are also encouraged.

Candidates should be nominated by accessing APA's EditorQuest site on the Web. Using your Web browser, go to <http://editorquest.apa.org>. On the Home menu on the left, find "Guests." Next, click on the link "Submit a Nomination," enter your nominee's information, and click "Submit."

Prepared statements of one page or less in support of a nominee can also be submitted by e-mail to Emnet Tesfaye, P&C Board Search Liaison, at Emnet@apa.org.

Deadline for accepting nominations is January 31, 2009, when reviews will begin.