

# Predictors of Posttraumatic Distress 1 Year After Exposure to Community Violence: The Importance of Acute Symptom Severity

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In this longitudinal study of 333 primarily male, Hispanic survivors of community violence, the authors investigated the effects of 4 categories of risk factors on posttraumatic stress disorder (PTSD) symptom severity: demographic characteristics, pretraumatic psychological factors, characteristics of the trauma, and reactions to the trauma. Replicating past research, exemplars from all 4 categories predicted PTSD symptom severity at 12-month follow-up. Acute symptom severity, measured approximately 5 days posttrauma, accounted for the largest proportion of variance among all the predictors included. No other predictors remained significant after 5-day distress was included in the model. These findings suggest that the effects of several purported risk factors for chronic posttraumatic distress may already be reflected in acute distress following trauma exposure. These results bear on current conceptions of the fundamental nature of PTSD and suggest that initial distress during the immediate aftermath of the trauma may be an important target for intervention.

*Keywords:* trauma, posttraumatic stress disorder, posttraumatic distress, community violence, acute symptoms

Why are some people more adept than others at negotiating life's hardships? This question is being asked increasingly for persons directly exposed to *community violence*, by which we mean instances in which individuals are assaulted by persons other than family or partners while in the community. Prior research on direct exposure to community violence shows that some individuals experience persistent posttraumatic psychological distress, whereas others do not. Prevalence rates of posttraumatic stress disorder (PTSD) vary widely as a function of the type and severity of trauma (e.g., 2% to 23%), but it is clear that only a subset of individuals will display symptoms of PTSD during the year after exposure to sudden, life-threatening trauma (e.g., Altindag, Ozen, & Sir, 2005; Breslau et al., 1998; Schnyder, Moergeli, Klaghofer, & Buddeberg, 2001). In recent years, much research has focused

on determining who is likely to experience future PTSD symptoms by examining factors associated with risk for either PTSD symptom severity or PTSD itself (for reviews, see Brewin, Andrews, & Valentine, 2000; Ozer, Best, Lipsey, & Weiss, 2003).

Although this attention has resulted in the identification of several broad classes of risk factors, much of this research has relied on retrospective, cross-sectional designs (e.g., Ai, Evans-Campbell, Santangelo, & Cascio, 2006; Pole, Best, Metzler, & Marmar, 2005; Paxton, Robinson, Shah, & Schoeny, 2004; Scarpa, Haden, & Hurley, 2006). In such studies, participants are asked to recall events and intrapsychic reactions that took place in the past. The relationship of these events and experiences to respondents' current PTSD symptoms is then examined. Thus, any associations that emerge may be produced by memory biases that are linked to current distress. Investigations into these possible biases suggest that recall of intrapsychic events (Marshall & Schell, 2002) and even relatively objective experiences (King et al., 2000; Roemer, Litz, Orsillo, Ehlich, & Friedman, 1998; Southwick, Morgan, Nicolaou, & Charney, 1997) are influenced by current emotional distress.

Moreover, of the longitudinal studies that do exist, few control for acute posttraumatic distress, thus introducing some of the same inferential problems that typically characterize cross-sectional studies. Specifically, a predictor measured at an early wave of a study may be the product of preexisting, but unmeasured, distress rather than its cause. In other words, failure to control for early distress presumes, rather than demonstrates, that the "risk factor" temporally precedes the distress. Efforts to identify and gauge the importance of risk factors have been based, almost entirely, on studies that do not demonstrate that the identified risk factors preceded the onset of PTSD symptoms, as can be seen from the studies forming the basis of two recent meta-analytic reviews

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This research was supported by National Institute of Mental Health (NIMH) Grants R01MH56122 and R01MH071636, National Institute on Alcohol Abuse and Alcoholism Grant R01AA014246, and William T. Grant Foundation Grant 99-1959-99. Thomas F. Denson was a RAND summer associate fellow for a portion of the period during which this research was conducted. The views expressed are ours and do not necessarily reflect those of the NIMH, the William T. Grant Foundation, or RAND. We gratefully acknowledge the generosity of the assault survivors who participated in this study as well as the efforts of the interview team.

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(Brewin et al., 2000; Ozer et al., 2003). Thus, further research is needed to examine the extent to which a putative predictor actually precedes PTSD symptoms rather than develops after the onset of psychological distress.

Although the existing literature does not generally demonstrate the temporal precedence of risk factors, it has identified four conceptually coherent classes of predictors of PTSD diagnosis and symptom severity: (a) demographic characteristics, (b) pretraumatic psychological factors, (c) characteristics of the traumatic event, and (d) reactions to the traumatic event. Studies have generally focused on a subset of these classes, rather than examining all four simultaneously (e.g., Andrews, Brewin, Rose, & Kirk, 2000; Perilla, Norris, & Lavizzo, 2002). Perhaps most commonly assessed are demographic characteristics such as gender, ethnicity, education, age, native language, and socioeconomic status, all of which appear to have modest relationships with PTSD (Brewin et al., 2000). For example, Hispanic combat veterans and police officers have higher rates or more severe symptoms of PTSD than do their Caucasian and African American counterparts (Kulka et al., 1990; Ortega & Rosenheck, 2000; Pole et al., 2001).

Pretraumatic psychological factors constitute a second class of predictors. These risk factors include prior exposure to stressors, preexisting psychopathology, and personality traits that appear to affect the severity of PTSD symptoms or the ability to recover from posttraumatic distress. Prior exposure to community violence, for example, has been associated with increased PTSD symptom severity (Chapin, 2004; Ozer & Weinstein, 2004). Similarly, previous exposure to stressful life events is moderately associated with PTSD as reported in Brewin et al.'s (2000) meta-analysis. Finally, personality dimensions such as neuroticism have been positively associated with posttraumatic distress, whereas constructs such as psychological resilience (e.g., optimism) have been negatively associated with levels of posttraumatic distress (Ai et al., 2006; Engelhard, van den Hout, & Kindt, 2003; Lauterbach & Vrana, 2001).

Characteristics of the traumatic event constitute another recognized class of risk factors. In the community violence literature, these may include the severity of the injury, length of hospitalization, and the mechanism of injury (e.g., gunshot, stabbing), with more severe injuries associated with higher levels of posttraumatic distress (Jaycox, Marshall, & Orlando, 2003; Verger et al., 2004). In addition, there is some evidence that rates of PTSD depend on the type of violent assault (Breslau et al., 1998).

Reactions to the traumatic event constitute a fourth category of risk factors. Some evidence suggests that a specific type of reaction that occurs during the traumatic event, *peritraumatic dissociation* (e.g., experiences of derealization or depersonalization during the traumatic event), may influence the long-term course of psychological adjustment to trauma (Ehlers, Mayou, & Bryant, 1998; Jaycox et al., 2003; Michaels et al., 1999; Shalev, Peri, Canetti, & Schreiber, 1996). Peritraumatic dissociation has emerged as a strong predictor of PTSD symptoms in survivors of community violence (e.g., Birnes et al., 2001).

Reactions that occur in the months and years following trauma exposure, so-called *maintaining factors* (Ehlers et al., 1998), may also extend the duration of problematic posttraumatic distress. Reactions to the traumatic event that appear empirically associated with posttraumatic distress include self-blame and negative appraisals of intrusions as well as anger (Andrews et al., 2000; Ehlers

et al., 1998; Jaycox et al., 2003; van den Hout & Engelhard, 2004). For example, individuals with PTSD reported more self-blame following a traumatic event than those without PTSD (Foa, Ehlers, Clark, Tolin, & Orsillo, 1999). Moreover, decreases in self-blame in response to therapy are associated with decreases in PTSD symptoms (Foa & Rauch, 2004), supporting the link between self-blame and PTSD symptoms. Insofar as few studies have simultaneously examined each class of risk factor, a more comprehensive understanding of risk factors would emerge from research that investigated the relative importance of each class of risk factor.

Another unresolved issue concerns the nature of acute symptoms of posttraumatic distress. Many have suggested that the majority of acute stress reactions are transient, with most distress remitting in the following weeks (e.g., Rothbaum, Foa, Riggs, Murdock, & Walsh, 1992; Yehuda, 2002). In keeping with this viewpoint, some theorists have suggested that initial posttraumatic distress may even represent an adaptive phenomenon, enabling traumatized individuals to obtain social support or cognitively process the trauma (Shalev, 2002). From this perspective, acute symptoms are uninformative about long-term outcomes because nearly everyone experiences high levels of distress in the immediate aftermath of a traumatic event (Yehuda, 2002). In contrast, other research suggests that the acute response to trauma is predictive of subsequent PTSD, such that greater initial distress is associated with a higher likelihood of chronic psychopathology or distress (Andrews et al., 2000; King et al., 2000; Meiser-Stedman, Yule, Smith, Glucksman, & Dalgleish, 2005; Simeon, Greenberg, Nelson, Schmeidler, & Hollander, 2005). Relatively few studies examining the natural course of adjustment to trauma have administered a measure of posttraumatic distress within the first few days following exposure (e.g. Andrews et al., 2000). Nonetheless, in the limited number of studies that have controlled for acute distress (e.g., Andrews et al., 2000; King et al., 2000; Meiser-Stedman et al., 2005; Simeon et al., 2005), early symptoms have been better predictors of long-term distress than were other risk factors studied. Thus, these two, somewhat different, views of initial symptoms have not yet been fully reconciled.

Using data from a National Institute of Mental Health funded longitudinal investigation of psychological adjustment in young adults following community-violence-related physical injury, we attempted to address some of the limitations of earlier research by simultaneously measuring exemplars from all four major classes of risk factors as well as symptoms of acute posttraumatic distress. This study of physically injured survivors of community violence was funded because relatively little research has examined the needs of this specific group of trauma survivors. Community violence is somewhat unique in that it involves intentional rather than unintentional (cf. motor vehicle crashes) perpetration of a malevolent act (cf. natural disaster). Although community and domestic violence possess certain similarities, community violence is generally not perpetrated by a loved one.

To our knowledge, the current research is the first to explicitly address the role of acute symptom severity in longitudinal research while systematically controlling for a wide variety of risk factors known to predict PTSD. Our specific goals were (a) to replicate cross-sectional findings demonstrating that exemplars of broadly defined risk factors assessed shortly after trauma exposure predict PTSD symptom severity at 12-months posttrauma, (b) to deter-

mine whether widely recognized risk factors remain significant predictors of 12-month PTSD symptom severity after adjusting for initial levels of posttraumatic distress, and (c) to evaluate the extent to which long-term symptoms of posttraumatic distress are explained by acute posttraumatic distress above and beyond the risk factors studied. If risk factors affect 12-month PTSD symptoms directly, then they should predict 12-month PTSD symptoms over and above acute symptoms of distress. Alternatively, if acute reactions determine long-term outcomes, then acute symptoms should emerge as a strong predictor of PTSD symptom severity at follow-up.

## Method

### *Participants and Procedure*

Between October 1998 and June 2000, the research staff attempted to screen all consecutive hospital admissions for a blunt or penetrating trauma at a Level I trauma facility. After an individual was deemed medically capable, research staff conducted a brief interview with potential participants to determine eligibility. Persons with injuries not attributable to community violence (e.g., accidents, motor vehicle crashes) were ineligible. Multiple attempts were made to include patients who were initially unavailable, seemed cognitively impaired, or were not alert enough to respond to the research staff. Of the 653 persons screened, 423 were deemed eligible. Of these, a total of 413 (98%) chose to participate in the baseline interview. The majority of participants (57%) had sustained injuries from gunshots, and the remainder had received injuries from blunt (e.g., closed fists or baseball bats) or other penetrating objects (e.g., knives).

Community violence tends disproportionately to affect young, ethnic-minority men of modest socioeconomic status (Reiss & Roth, 1993). This characterization aptly reflected the composition of our sample (mean age = 25.10 years,  $SD = 6.03$ ; 94% were male; 41% were high school graduates; 79% reported earning \$1,500 pretax income or less in the 30 days preceding their injury; and 78% were Hispanic). Of Hispanic respondents, 47% were born in the United States, 38% in Mexico, and 15% in Central America. When asked which country they identified with other than the United States, 77% of Hispanic respondents indicated Mexico, followed by Central America (18%), South America (2%), Puerto Rico or Cuba (2%), or other Latin American or Caribbean nations (1%).

All participants completed face-to-face structured interviews conducted by trained lay interviewers. Interviews were conducted in English (72%) or Spanish (28%), depending on participant preference. The initial interview took place in hospital within days of the injury; the median interval between admission and the baseline interview was 5 days. Subsequent face-to-face in-home interviews were conducted at 3 and 12 months following the initial interview. For the present purposes, PTSD symptom severity at the 12-month assessment was the outcome of interest. Of the 413 participants who were interviewed at baseline, 304 participants (74%) completed the 12-month follow-up interview. For participants for whom 12-month outcomes were unavailable ( $n = 32$ ), PTSD symptom severity data from the 3-month interview was used to estimate 12-month PTSD symptom severity, as described below. Three additional participants were removed from analyses

because of more extensive missing data. The resulting analytic sample consisted of 333 individuals. Participants were given \$25 for each interview completed.

### *Measures*

*Demographic variables.* Participants indicated their gender, age, ethnicity, income, and educational attainment. Because the sample was primarily Hispanic, statistical power to detect meaningful differences between ethnic or racial groups was limited. Therefore, ethnicity was coded as Hispanic/non-Hispanic. Similarly, because of the limited number of participants who had completed some college education, educational attainment was coded as completed high school versus did not complete high school. We also coded whether the interview was conducted in English or Spanish. Because using the language of one's adopted country has been closely associated with acculturation (Barona & Miller, 1994), the language-of-interview variable can be seen as a proxy for acculturation.

*Pretraumatic psychological factors.* These factors included prior exposure to traumatic events and life stressors, pretraumatic psychological symptoms, and personality variables. Lifetime community violence exposure was assessed with 18 items modeled after the Survey of Children's Exposure to Community Violence (SCECV; Richters & Saltzman, 1990). Although designed for children, the SCECV consists of items relevant to adult exposure and was used because no adult instruments existed when the study was fielded. The original SCECV inquired about direct exposure, witnessed exposure, and violent acts that were learned about from another person. In its original format, for each type of exposure, respondents were asked to report the total number of lifetime exposures. To ease respondent burden, our modified version of the instrument focused only on dichotomously scored direct exposure (e.g., "Have you ever been stabbed or attacked with a knife or sharp object?"). The attack that was responsible for hospitalization was not included. Positively endorsed responses were summed to create an index of violence exposure ( $M = 5.58$ ,  $SD = 3.14$ ; values ranged from 0 to 16). Other lifetime trauma exposure was assessed via 8 items assessing non-community-violence-related traumatic events (e.g., "Have you ever experienced a serious accident, fire or explosion?"). Positively endorsed responses were summed to create an index of non-community-violence-related trauma exposure ( $M = 1.40$ ,  $SD = 1.16$ ; values ranged from 0 to 6).

The number of life stressors during the past year was assessed with nine items drawn from the Life Experiences Survey (LES; Sarason, Johnson, & Siegel, 1978). The LES was originally developed for use with college students and contained many items of limited relevance. We selected items of greatest relevance to our population; these items were also among the most severe. Participants endorsed whether they had experienced any of a range of negative experiences including the dissolution of a romantic relationship, a major health problem, spending time in jail, and losing a job. Positively endorsed responses were summed to create an index of exposure to life stressors ( $M = 2.08$ ,  $SD = 1.68$ ; values ranged from 0 to 7).

Recent history of major depression and dysthymia was assessed with three dichotomous items developed by Rost, Burnam, and Smith (1993; i.e., "In the past year have you had 2 weeks or more during which you felt sad, blue, or depressed; or when you lost all

interest or pleasure in things that you usually cared about or enjoyed?" "Have you had 2 years or more in your life when you felt depressed or sad most days, even if you felt okay sometimes?" and "Have you felt depressed or sad much of the time in the past year?"). Sensitivity of the screener has been shown to fall between 83% and 94%, and specificity has been shown to be over 90% relative to a diagnostic instrument (Rost et al., 1993). Items were summed to create an index ( $M = 0.55$ ,  $SD = 0.78$ ; values ranged from 0 to 2).

Optimism and neuroticism, personality dimensions that have been linked to posttraumatic distress, were assessed (Ai et al., 2006; Engelhard et al., 2003). Trait optimism was measured with the 6-item Life Orientation Test—Revised (Scheier, Carver, & Bridges, 1994;  $M = 3.48$ ,  $SD = 0.66$ ,  $\alpha = .64$ ; values ranged from 1.5 to 5), with response options ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Optimistic individuals generally expect positive outcomes in life even when troubled (e.g., "I usually expected the best to happen"). Trait neuroticism was assessed with 5 items from the NEO Five-Factor Inventory (Costa & McCrae, 1989). Participants were asked to evaluate the personal relevance of each statement on a scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), and responses were averaged ( $M = 2.71$ ,  $SD = 0.86$ ,  $\alpha = .77$ ). This measure was abbreviated from the full 12-item scale to minimize respondent burden. Individuals high in neuroticism tend to be emotionally labile and frequently experience negative affect and cognition (e.g., "sometimes I felt completely worthless"). Research supports the discriminant validity of the two constructs (e.g., Scheier et al., 1994). Participants were explicitly asked to provide answers with respect to "what you were generally like as a person before the attack" to limit biases resulting from acute distress.

*Characteristics of the traumatic event.* The severity of the injury, mechanism of assault, and length of hospitalization were all obtained from computerized medical records. Objective injury severity was obtained using the Injury Severity Scores (ISS; Association for the Advancement of Automotive Medicine, 1990). This index incorporates the site and extent of injuries into a single score ranging from 1 to 75, with higher scores indicating a higher probability of death from the injuries ( $M = 9.03$ ,  $SD = 8.89$ ; values ranged from 1 to 75). A score of 9 is considered to be mild to moderate in severity (Collopy et al., 1992). The mechanism of assault was coded as gunshot versus all other mechanisms (e.g., stabbing, beating). The mean length of hospitalization was 6.96 days ( $SD = 8.06$ ;  $Mdn = 5$ ; values ranged from 0 to 66). The ISS and length of hospitalization variables were log transformed to meet the assumptions of linearity in the regression analyses.

*Reactions to the traumatic event.* Two exemplars of reactions to the traumatic event were assessed: peritraumatic dissociation and self-blame. To assess peritraumatic dissociation, we used a modified 8-item version of the 10-item Peritraumatic Dissociative Experiences Questionnaire (PDEQ; Marmar, Weiss, & Metzler, 1997). This modified instrument (i.e., the RAND PDEQ) was developed to render the instrument more understandable to persons from diverse ethnic and socioeconomic backgrounds. On the basis of prior research, one item was dropped because it appeared not to be well understood; another was deleted because of poor psychometric properties (Marshall, Orlando, Jaycox, Foy, & Belzberg, 2002). Some items were modified or shortened (e.g., "Things happened that I didn't notice, even though I normally would have

noticed them"). The RAND PDEQ has demonstrated good internal consistency and test-retest reliability, as well as discriminant and convergent construct validity in both community violence survivors and individuals who have experienced sexual abuse (Marshall & Orlando, 2002; Marshall et al., 2002). The RAND PDEQ is highly correlated with the original PDEQ ( $r = .89$ ; Marshall et al., 2002; Study 3). Items were rated on a scale ranging from 1 (*not at all true*) to 5 (*extremely true*) and averaged 2.69 ( $SD = 0.89$ ,  $\alpha = .69$ ; values ranged from 1 to 5).

Self-blame for the attack was assessed using items developed by Downey, Silver, and Wortman (1990) and assessed the extent to which participants blamed themselves for the attack (i.e., "How much do you blame yourself for what happened?", "How much would you say it happened because of something about you as a person?"). Although more recent instruments assess self-blame in the context of trauma exposure, these instruments were either unavailable at the time the study was conducted or were not suitable for the current purposes. The statements were rated on a scale ranging from 1 (*not at all*) to 5 (*extremely*) and summed ( $M = 4.65$ ,  $SD = 2.33$ ,  $\alpha = .48$ ; values ranged from 2 to 10).

*PTSD symptom severity.* PTSD symptom severity was assessed using the 17-item PTSD Checklist (PCL; Weathers, Litz, Herman, Huska, & Keane, 1993). The PCL has been used in diverse samples, including community violence survivors, and possesses solid psychometric properties (Andrykowski, Cordova, Studts, & Miller, 1998; Blanchard, Jones-Alexander, Buckley, & Forneris, 1996). Participants rated the degree to which they were bothered by each symptom on a scale ranging from 1 (*not at all*) to 5 (*extremely*). At all interviews, symptoms were assessed with respect to the attack (e.g., "How much have you been bothered by repeated, disturbing dreams of *the attack*?"). The time frame for the questions differed slightly across 5-day (i.e., "since the attack") and later follow-up interviews (i.e., "past 7 days"). Responses from the 17 items were averaged into a symptom severity score (5-day assessment:  $M = 2.29$ ,  $SD = 0.86$ ,  $\alpha = .88$ ; values ranged from 1 to 5; 12-month follow-up:  $M = 2.01$ ,  $SD = 0.91$ ,  $\alpha = .93$ ; values ranged from 1 to 4.77).

### Data Analysis

*Missing data.* We used a mix of imputation and attrition weighting to address missing data. Missing data occurred infrequently for the 17 predictor variables, that is, fewer than 1% of the data points. Nonetheless, casewise deletion would have resulted in the loss of 35 cases (10%). For this reason, we imputed predictor values for 31 respondents who were missing a single data point and 1 respondent who was missing 4 data points. Three other respondents had more extensive missing data and were dropped from the analyses.

For 32 participants who completed a PTSD symptom assessment at the 3-month follow-up but who were missing data from the 12-month follow-up, we used a data resampling technique (*hot-decking*) for imputation of the 12-month outcome variable (Little & Rubin, 1987). Using this approach, we randomly selected a single data value from among those respondents who were similar to the target respondent in their symptoms of psychological distress at the 3-month interview. Thus, we imputed a 12-month PTSD symptom severity value conditioned on their level of distress at the 3-month assessment. This strategy yielded an analytic

sample of 333 cases for multivariate regression analyses, with 77 cases lost to follow-up.

To address attrition, we developed weights to reduce threats to validity associated with attrition of the 77 cases. Specifically, cases in the analytic sample that were similar on the 17 baseline predictors to the attrited cases were given increased weight in the analysis, using the method described by McCaffrey, Ridgeway, and Morral (2004). This procedure resulted in a very close match between the distributions of these variables in the entire baseline sample and the weighted analytic sample. All analyses presented are based on weighted data.

*Regression model specification.* Because of the difficulties associated with accurately estimating parameters in models with relatively large numbers of correlated predictors, we used hierarchical multiple regression with stepwise model pruning to maintain efficient estimation. Specifically, variables were entered sequentially in blocks according to the four time-ordered categories of risk factors discussed earlier: (a) demographic characteristics, (b) pretraumatic psychological factors, (c) characteristics of the traumatic event, and (d) reactions to the traumatic event. Five-day PTSD symptom severity was entered in a final step.

All variables within a block were entered into the model simultaneously. The significance of the entire block was tested, and standardized coefficients from that model are presented. Prior to adding the subsequent block of predictors, however, the just-entered block was pruned in stepwise fashion to maintain a parsimonious model with efficient parameter estimates. As has been recommended, we used a liberal statistical threshold ( $p > .20$ ) for removing a predictor from the model to avoid eliminating too many variables (Bendel & Affifi, 1977; Tabachnick & Fidell, 2006). Thus, although 17 separate predictors were tested in these models, no single regression model included more than 10 predictors. The resulting model complexity can easily be supported with our sample size.

Results

*Descriptive Analyses*

A substantial portion of the sample reported clinically significant psychological distress at each assessment. For the purpose of illustrating the degree of distress in this sample, PCL screener responses were categorized to identify persons meeting symptom criteria for PTSD using the procedure recommended by Weathers et al. (1993). Specifically, individual symptoms receiving a score of 3 (*moderately*) or greater were treated as indicating symptom presence and mapped against the *DSM-IV* Criteria B–D. Following this scoring strategy, 25% of participants met screening criteria for PTSD at the 5-day assessment (excluding duration), whereas 20% met criteria at 12-month follow-up. Moreover, although there was a statistically significant decrease in symptom severity for the sample over time,  $t(333) = 5.78, p < .001$ , the effect size was small ( $d = -.31$ ). Overall, this finding suggests that symptom levels, although declining somewhat, stayed relatively constant over the year following the attack.

*Bivariate Relationships*

Correlations among all measures are presented in Table 1. As expected, several predictors had significant bivariate associations with 12-month PTSD symptoms. Recent history of depression, lifetime violence exposure, neuroticism, optimism, injury severity, length of hospitalization, peritraumatic dissociation, self-blame, and 5-day PTSD symptom severity were all associated with PTSD symptom severity at follow-up. The magnitude of the correlation between 5-day and 12-month PTSD symptom severity was nearly twice that of other independent variables. In summary, the bivariate effect sizes between 12-month symptom severity and the correlates found in our study are quite comparable to the small-to-moderate effects (e.g., Rosenthal, 1991) reported in the two

Table 1  
*Intercorrelations Between the Measures*

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1. Hispanic ethnicity	—																			
2. Age	<b>-.20</b>	—																		
3. Male gender	<b>.11</b>	-.08	—																	
4. Completed high school	<b>-.26</b>	<b>.17</b>	.03	—																
5. Income	.03	<b>.27</b>	-.07	<b>.16</b>	—															
6. Interview in English	<b>-.29</b>	<b>-.17</b>	-.07	<b>.25</b>	-.07	—														
7. Pretraumatic depression	-.06	.09	-.02	-.08	-.05	.04	—													
8. Optimism	.01	.09	-.04	<b>.18</b>	.05	<b>-.20</b>	<b>-.17</b>	—												
9. Lifetime violence exposure	<b>-.13</b>	.03	.03	<b>.12</b>	-.06	<b>.31</b>	<b>.23</b>	<b>-.18</b>	—											
10. Lifetime trauma exposure	<b>-.14</b>	<b>.19</b>	<b>-.12</b>	<b>.18</b>	<b>.14</b>	.07	<b>.28</b>	.02	<b>.61</b>	—										
11. Neuroticism	-.09	-.03	<b>-.16</b>	-.08	-.06	<b>.25</b>	<b>.42</b>	<b>-.36</b>	<b>.30</b>	<b>.17</b>	—									
12. Past year life stressors	-.04	<b>-.16</b>	.00	-.02	<b>-.21</b>	<b>.23</b>	<b>.25</b>	<b>-.18</b>	<b>.39</b>	<b>.26</b>	<b>.36</b>	—								
13. Injury severity	-.02	<b>-.13</b>	.01	-.02	-.02	-.01	.04	-.01	-.07	-.10	.01	.01	—							
14. Length of hospitalization	.06	-.07	.01	-.07	-.08	.01	.04	-.03	-.04	-.10	.06	.03	<b>.60</b>	—						
15. Gunshot	.09	-.27	.03	-.02	.05	.11	.05	-.05	.04	-.05	.04	.01	<b>.14</b>	<b>.30</b>	—					
16. Peritraumatic dissociation	-.01	.11	-.10	-.10	-.05	-.10	<b>.15</b>	-.06	.05	.10	<b>.20</b>	.03	<b>.18</b>	<b>.13</b>	-.08	—				
17. Self-blame	-.04	-.01	.06	.03	-.10	<b>.15</b>	<b>.22</b>	-.08	<b>.28</b>	<b>.13</b>	<b>.27</b>	<b>.16</b>	.08	.03	-.04	.08	—			
18. 5-day symptom severity	-.09	.06	<b>-.11</b>	.01	.03	.03	<b>.25</b>	-.08	<b>.19</b>	<b>.30</b>	<b>.32</b>	<b>.16</b>	<b>.19</b>	.09	.02	<b>.47</b>	<b>.25</b>	—		
19. 12-month symptom severity	<b>-.16</b>	<b>.16</b>	<b>-.11</b>	-.02	-.04	-.02	<b>.21</b>	<b>-.13</b>	<b>.12</b>	<b>.15</b>	<b>.18</b>	.04	<b>.13</b>	<b>.11</b>	-.01	<b>.21</b>	<b>.18</b>	<b>.48</b>	—	

Note. Correlations in boldface are significant ( $p < .05$ ).

prior meta-analyses of PTSD correlates (i.e., Brewin et al., 2000; Ozer et al., 2003). The pattern of relationships among the variables demonstrates the discriminant and convergent construct validity of the measures.

### Multivariate Relationships

Results from multivariate regression analyses are shown in Table 2.

**Block 1: Demographic characteristics.** When entered as a block, demographic characteristics explained a small, but significant, percentage of the variance in 12-month PTSD symptom severity (4%). The small size may be due to a restricted range on demographic characteristics in the sampled population. Yet, this finding is generally consistent with prior meta-analytic results (Brewin et al., 2000). Only two demographic variables emerged as significant unique predictors of follow-up PTSD symptom severity. Specifically, Hispanic ethnicity was associated with decreased symptom severity, and older age was associated with increased PTSD symptom severity.

**Block 2: Pretraumatic psychological factors.** Demographic characteristics and pretraumatic psychological factors combined to explain significantly more variance (8%) than demographic characteristics alone (4%). Of the five variables in this block, only a recent history of depression prior to the traumatic event had a significant unique association with 12-month PTSD symptom severity while controlling for the other pretraumatic and demographic factors.

**Block 3: Characteristics of the traumatic event.** Inclusion of characteristics of the traumatic event improved model prediction by a small, but significant, amount (2%) relative to a model that included pretraumatic and demographic characteristics. Only injury severity was uniquely related to 12-month PTSD symptoms when we controlled for the pretraumatic and demographic factors.

**Block 4: Reactions to the traumatic event.** Addition of the two psychological reaction variables resulted in a significant improvement in explanatory power, accounting for an additional 4% of the variance. Both peritraumatic dissociation and self-blame were significant predictors of 12-month PTSD symptom severity, thus replicating past research (e.g., Pole et al., 2005) reporting that

Table 2  
Standardized Regression Coefficients Predicting PTSD Symptom Severity 12 Months Posttrauma ( $N = 333$ )

Predictor	Block 1: Demographics		Block 2: Pretraumatic psychological factors		Block 3: Characteristics of the trauma		Block 4: Reactions to the trauma		Block 5: Five-day PTSD symptom severity		
	$\beta$	95% CI	$\beta$	95% CI	$\beta$	95% CI	$\beta$	95% CI	$\beta$	95% CI	
<i>Demographic characteristics</i>											
Hispanic ethnicity	-.16*	-.28, -.03	-.12*	-.24, .00	-.13*	-.24, -.01	-.12*	-.24, -.00	-.09	-.20, .02	
Age	.13*	.01, .25	.11†	-.02, .24	.14*	.01, .27	.12*	.00, .24	.11	-.01, .22	
Male gender	-.08	-.19, .03	-.07	-.17, .03	-.09	-.19, .01	-.08	-.17, .01	-.05	-.14, .03	
Completed high school	-.06	-.17, .05	—	—	—	—	—	—	—	—	
Income	-.03	-.14, .08	—	—	—	—	—	—	—	—	
Interview in English	-.01	-.13, .11	—	—	—	—	—	—	—	—	
<i>Pretraumatic psychological factors</i>											
Pretraumatic depression	—	—	.13**	.00, .27	.16**	.05, .27	.12*	.01, .23	.08	-.03, .19	
Optimism	—	—	-.10	-.21, .02	-.11	-.22, .00	-.09	-.20, .01	-.08	-.18, .02	
Lifetime violence exposure	—	—	.01	-.15, .16	—	—	—	—	—	—	
Lifetime trauma exposure	—	—	.08	-.06, .22	—	—	—	—	—	—	
Neuroticism	—	—	.06	-.08, .22	—	—	—	—	—	—	
Past year life stressors	—	—	-.02	-.19, .14	—	—	—	—	—	—	
<i>Characteristics of the traumatic event</i>											
Injury severity	—	—	—	—	.12**	-.02, .26	.11*	.02, .21	.08	-.02, .17	
Length of hospitalization	—	—	—	—	.05	-.08, .19	—	—	—	—	
Gunshot	—	—	—	—	-.01	-.12, .11	—	—	—	—	
<i>Reactions to the traumatic event</i>											
Peritraumatic dissociation	—	—	—	—	—	—	.16**	.04, .28	-.01	-.13, .11	
Self-blame	—	—	—	—	—	—	.12*	.02, .23	.05	-.05, .15	
Initial symptoms of distress: Five-day PTSD severity	—	—	—	—	—	—	—	—	.40***	.26, .54	
Adjusted $R^2$	.04*		.08***		.10***		.14***		.25***		
$\Delta$ Adjusted $R^2$	.04*		.04**		.02*		.04**		.11***		

Note. When  $p > .20$ , the variable was not included in subsequent blocks. Dashes represent variables that were omitted from a block. Coefficients and confidence intervals (CIs) are presented for the full model. Probability values are reported for the pruned model. PTSD = posttraumatic stress disorder. †  $p = .05$ . \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

peritraumatic dissociation was associated with heightened PTSD symptom severity. In summary, the findings from Blocks 1 through 4 were broadly consistent with prior studies that have identified correlates of PTSD within the four classes of risk factors.

*Block 5: Five-day PTSD symptom severity.* Five-day posttraumatic distress was the strongest predictor of 12-month PTSD symptom severity. Although 6 constructs had been significant predictors of 12-month PTSD symptom severity in the Block 4 model, none remained a significant predictor after 5-day symptoms entered the model. Moreover, the strength of the relationship between 5-day and 12-month PTSD symptom severity ( $\beta = .40$ ) was not greatly attenuated from its zero-order magnitude ( $r = .48$ ), even after controlling for the nine most important predictors. The addition of 5-day symptom severity also resulted in the largest improvement in the predictive ability of the model (11%). As can be seen in the Block 5 model, this single coefficient is approximately 4 times larger than any other predictor and is nearly as large as all other predictors combined. Overall, variables assessed in the immediate aftermath of the trauma accounted for a considerable amount of the variance in PTSD symptom severity 12-months later, corresponding to  $R = .52$ , an effect size of likely clinical significance (e.g., Rosenthal & Rosnow, 1991).

#### *Additional Analyses With PTSD Symptom Severity Expressed Dichotomously*

As a sensitivity test, the regression analyses were replicated using logistic regression and a dichotomous index of probable PTSD. Across all blocks, no variables were significant in the logistic regression that had not been significant in the linear regression. In addition, 5-day PTSD symptom severity was the only significant predictor of probable PTSD in Model 5 (odds ratio = 2.30, 95% confidence interval = 1.41 to 2.76,  $p = .001$ ).

### Discussion

This longitudinal study of young adult survivors of community violence investigated the effects of a wide range of risk factors on PTSD symptom severity 12 months after hospitalization. Our three aims were (a) to replicate cross-sectional findings that exemplars of four key classes of risk factors predicted PTSD symptom severity at 12 months following the attack, (b) to determine the extent to which these risk factors were predictive of PTSD symptom severity independent of 5-day PTSD symptom severity, and (c) to empirically examine the degree to which long-term PTSD symptom severity is explained by high levels of initial posttraumatic distress. Potential risk factors were selected from four conceptually distinct classes derived from the literature.

With respect to the first objective, the regression analyses revealed that constructs from each of the four conceptually differentiable blocks were important determinants of 12-month PTSD symptom severity. Specifically, demographic characteristics (i.e., age, Hispanic ethnicity), pretraumatic psychological factors (i.e., recent history of depression), characteristics of the traumatic event (i.e., injury severity), and reactions to the traumatic event (i.e., peritraumatic dissociation, self-blame) all predicted PTSD symptom severity at 12 months. Moreover, when entered sequentially in blocks, each category of risk factor accounted for a significant

improvement in the amount of variance explained. Taken together, these four categories of risk factors accounted for 14% of the variance in PTSD symptom severity. This pattern of findings is broadly consistent with prior research suggesting that a wide range of factors may help determine who is susceptible to experiencing chronic symptoms of PTSD following exposure to a potentially traumatic event (Brewin et al., 2000; Ozer et al., 2003).

With regard to the second goal, results indicated that 5-day PTSD symptom severity remained the only significant predictor of 12-month PTSD after we adjusted for the four classes of apparent risk factors. Indeed, 5-day distress was the single largest predictor of subsequent PTSD symptom severity, explaining nearly as much variability in PTSD symptom severity as all other predictors combined. Although this finding is consistent with the limited number of previous longitudinal studies that have examined acute symptoms (Andrews et al., 2000; King et al., 2000; Marshall & Schell, 2002; Meiser-Stedman et al., 2005; Simeon et al., 2005), to our knowledge, the current study was the first to explicitly address the role of acute symptoms while systematically adjusting for a broad range of theoretically important risk factors.

The actual magnitude of the regression coefficients changed dramatically when 5-day PTSD symptom severity was entered into the model. The two strongest predictors from the Block 4 model (i.e., peritraumatic dissociation and self-blame) were very nearly reduced to zero after we controlled for 5-day distress. In contrast, the smaller associations with demographic factors were only modestly changed when 5-day distress was included. This finding is consistent with the observation that demographic factors are not plausible products of early distress (i.e., respondent age and gender are unlikely to change with distress), whereas retrospectively measured psychological factors may influence early distress (or vice versa).

Concerning the third goal, these data indicate that, at least for our sample of community violence survivors, symptoms of distress in the days immediately following the trauma were good predictors of long-term psychological problems. This finding appears at odds with theory suggesting that acute distress is of limited predictive utility for future distress because it is nearly universal (e.g., Yehuda, 2002). Instead, our data are consistent with the view that high levels of acute posttraumatic distress should be seen as a marker for risk of long-term psychological problems. Insofar as individuals who are most distressed in the immediate days following trauma exposure are also those most likely to be symptomatic 12 months later, it would appear that long-term psychopathology might be significantly influenced by survivors' extreme initial reactions to a traumatic event.

These findings draw attention to an important conceptual distinction between correlates of psychopathology and variables that provide information about risk for subsequent psychopathology. Because of the reliance on retrospective data in the PTSD literature, *risk factor* is often used interchangeably to denote a cross-sectional correlate of psychopathology as well as a variable that has been demonstrated to precede the development of psychopathology. This practice of referring to concurrent associations as if there is evidence of temporal precedence may hamper progress in the field to the degree that it obscures those variables that can be used to identify the individuals who are most likely to develop a disorder, the events that give rise to the disorder, and the factors that might be manipulated to mitigate distress caused by the

disorder. The field should reserve the term *risk factor* for variables that demonstrate both association and precedence. In the current study, only acute posttraumatic distress appeared to meet these criteria, although several variables were correlated with distress.

These results may have important implications for the treatment of trauma-related psychopathology. They suggest that high levels of distress during the immediate aftermath of trauma may be an important target for intervention or prevention. Most respondents who developed chronic PTSD symptoms in this sample had established an unhealthy pattern of distress very early—within days of the trauma. An intervention that effectively targets these acute reactions may be able to provide long-term benefits. Although some forms of early intervention have been found to be ineffective or even counterproductive (e.g., psychological debriefing; Mitchell, 1983; for a review, see McNally, Bryant, & Ehlers, 2003), others appear to possess considerable promise (Bryant, Harvey, Dang, Sackville, & Basten, 1998; Ehlers & Clark, 2003; Litz, Gray, Bryant, & Adler, 2002; McNally et al., 2003). When combined with brief screening procedures to identify high-risk individuals, such interventions may be cost-effective and beneficial to those most likely to experience extended PTSD symptoms.

These data also appear to bear on some conceptualizations regarding the etiology of PTSD. In particular, our finding that self-blame appears not to contribute directly to PTSD seems to be inconsistent with some previous research (e.g., Pole et al., 2005). At first glance, this finding could be inappropriately regarded as indicating that self-blame is not an important contributor to PTSD. However, self-blame may operate by influencing acute symptoms of distress, which, in turn, affect long-term adjustment (Koss & Figueredo, 2004). As such, self-blame may be a worthy target of intervention even though it was not significantly associated with 12-month posttraumatic distress when we controlled for symptoms at 5 days.

This research is limited in certain respects. First, because our sample consisted primarily of young, male, Hispanic survivors of community violence, our results may not generalize to other populations. In a related vein, our findings with respect to age and ethnicity were somewhat inconsistent with evidence from the broader literature (e.g., Brewin et al., 2000; Pole et al., 2001). Specifically, being younger and of Hispanic ethnicity was associated with less likelihood of developing persistent distress following community-violence-related assault. Because this study focused on young adults and the sample was composed largely of Hispanics, however, this study has restricted ability to address relations between these constructs and PTSD symptom severity. Additional research is needed.

A second limitation stems from participant attrition. Although we addressed this issue with modern analytic techniques, it is possible that the predictors of PTSD symptoms among the 77 missing cases would differ from the pattern found in the available sample. Another concern is that several measures were assessed retrospectively. Evidence to date suggests that the errors introduced by retrospection typically lead to overestimating relationships with psychopathology (e.g., King et al., 2000; Marshall & Schell, 2002). It is possible, however, that some retrospective biases attenuate the observed relationships. Although the current data were typically obtained within 5 days of trauma exposure, additional research is needed that prospectively collects data on potential risk factors before the traumatic event to assess the extent

to which retrospective biases may mask true risk factors. Finally, although we attempted to assess a wide range of potential predictors, it is possible that we omitted constructs that could have aided in the prediction of 12-month PTSD symptom severity. To the extent that this was the case, additional research is warranted.

In sum, this longitudinal study presented evidence that acute distress is the single most important risk factor for 12-month PTSD symptoms in survivors of community violence. Although correlated with 12-month outcomes, numerous theoretically relevant variables were no longer predictive of PTSD symptom severity over and above their relationship to 5-day distress. To our knowledge, this study is the most comprehensive analysis of this issue to date. These data suggest that the effects of several purported risk factors for chronic posttraumatic distress are already reflected in distress approximately 5 days after the trauma. This finding raises questions about the nature of symptoms of distress that, when occurring in the immediate days following trauma exposure, are often regarded as normal and nonpathognomonic. Results also underscore the potential value of early interventions for symptomatic survivors of trauma.

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Received September 13, 2006

Revision received March 14, 2007

Accepted March 19, 2007 ■

### Call for Nominations

The Publications and Communications (P&C) Board of the American Psychological Association has opened nominations for the editorships of **Psychological Assessment**, **Journal of Family Psychology**, **Journal of Experimental Psychology: Animal Behavior Processes**, and **Journal of Personality and Social Psychology: Personality Processes and Individual Differences (PPID)**, for the years 2010–2015. Milton E. Strauss, PhD, Anne E. Kazak, PhD, Nicholas Mackintosh, PhD, and Charles S. Carver, PhD, respectively, are the incumbent editors.

Candidates should be members of APA and should be available to start receiving manuscripts in early 2009 to prepare for issues published in 2010. 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.

Search chairs have been appointed as follows:

- **Psychological Assessment**, William C. Howell, PhD, and J Gilbert Benedict, PhD
- **Journal of Family Psychology**, Lillian Comas-Diaz, PhD, and Robert G. Frank, PhD
- **Journal of Experimental Psychology: Animal Behavior Processes**, Peter A. Ornstein, PhD, and Linda Porrino, PhD
- **Journal of Personality and Social Psychology: PPID**, David C. Funder, PhD, and Leah L. Light, PhD

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 [etesfaye@apa.org](mailto:etesfaye@apa.org).

Deadline for accepting nominations is **January 10, 2008**, when reviews will begin.