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Posttraumatic symptoms following a campus shooting: The role of psychosocial resource loss

Heather Littleton[1], **Mandy Kumpula**[2], and **Holly Orcutt**[2]

[1]Department of Psychology, 104 Rawl, East Carolina University, Greenville, NC 27858

[2]Department of Psychology, Northern Illinois University, DeKalb, IL

Abstract

Conservation of resources (COR) theory has proven a useful framework for understanding posttrauma adjustment. A key tenet of this theory is the centrality of resource loss in determining adjustment. However, COR theory research has often been limited by retrospective research design, a focus on material loss (e.g., one's home), and a lack of attention to other adjustment predictors. The current study examined whether psychosocial resource loss prospectively predicted PTSD symptomatology both immediately and eight months following a campus shooting in a sample of college women (*n* = 691). Results supported that resource loss predicted symptomatology, even after controlling for other predictors including prior trauma, psychological distress, initial PTSD symptomatology, and shooting exposure. Implications of the results for research and intervention following mass trauma are discussed.

Recent work supports that many traumas are best thought of as mass traumas, leaving whole communities affected in their wake (North & Pfefferbaum, 2002). Indeed, studies following mass traumas including the September 11th attacks and mass shootings support that many individuals experience significant distress following these events, such as the development of posttraumatic stress disorder (PTSD; Galea et al., 2002; Littleton, Grills-Taquechel, & Axsom, 2009; North, Smith, & Spitznagel, 1994; Schwarz & Kowalski, 1991). These reactions can occur even among those not directly exposed to the trauma (Blanchard et al., 2004; Littleton et al., 2009; North et al., 1994; Schwarz & Kowalski, 1991; Silver et al., 2004). This suggests a need to develop a clearer understanding of what places individuals at risk for experiencing significant and persistent distress following mass trauma.

Conservation of resources (COR) theory has proven to be a highly useful framework for understanding why individuals who experience mass trauma often develop significant and persistent distress (Hobfoll & Lilly, 1993). COR theory focuses on the role of *changes* in resources in understanding adjustment following trauma (Hobfoll & Lilly). This theory defines resources as “objects, personal characteristics, conditions, or energies that are valued in their own right, or that are valued because they act as conduits to the achievement or protection of valued resources” (Hobfoll, 2001, p. 339). Thus, resources include not only tangible items (e.g., a home, vehicle, clothing) and conditions (e.g. employment), but also interpersonal (e.g., intimacy, affection) and intrapersonal (e.g., sense of life direction, hope) resources (Hobfoll, 2001). According to COR theory, the extent to which a trauma results in loss of valued resources is instrumental in determining adjustment (Hobfoll). The primary tenet of this theory is that the more resources an individual loses as a result of trauma, the less he or she will be able to successfully adjust (Hobfoll).

Corresponding Author: littletonh@ecu.edu.

Loss of resources is posited to be such an important determinant of posttrauma adjustment because it is so costly to the individual. When an individual loses resources as a result of trauma, he or she must then invest further resources to restore the ones that are lost (Hobfoll & Lilly, 1993). The experience of resource loss also makes the individual vulnerable to further loss, resulting in a resource loss spiral (Hobfoll & Lilly). This occurs in part because individuals who lose resources are less able to invest more resources to regain lost ones (Hobfoll & Lilly). An individual who has experienced resource loss also has fewer resources available to respond to further stressors (Monnier & Hobfoll, 2000), increasing the likelihood that experiencing additional stressors leads to more resource loss.

A fairly extensive body of research supports that loss of resources predicts psychological distress following a variety of traumatic experiences including floods, hurricanes, earthquakes, the September 11th attacks, and mass shootings (Benight et al., 1999; Galea et al., 2002; Hobfoll, Tracy, & Galea, 2006; Littleton et al., 2009; Sumer, Karanci, Berument, & Gunes, 2005; Waelde, Koopman, Rierdan, & Spiegel, 2001). However, research in this area has a number of limitations. Many studies have been cross-sectional, and thus have not evaluated the extent to which resource loss predicts adjustment over time. In addition, past studies have often focused on traumas in which individuals experienced major losses of tangible resources (e.g., home, vehicle, job) and most have focused specifically on the role of loss of these tangible resources in predicting adjustment, or have not separated material loss from other forms of loss. However, some traumas may result in significant distress but may not involve extensive loss of material resources. Thus, loss of material resources may not be strongly related to adjustment following these events. Finally, only limited research has evaluated if resource loss predicts adjustment after controlling for other relevant factors that are related to distress following a traumatic experience (e.g., level of exposure to the trauma, pre-trauma psychological adjustment).

Thus, the current study sought to examine the extent to which loss of psychosocial resources predicted PTSD symptomatology among college women exposed to the mass shooting at Northern Illinois University (NIU). This mass shooting incident occurred on February 14, 2008 and involved a lone gunman who was a former NIU student. The gunman opened fire in a large lecture hall and killed five students and wounded 17 others before killing himself (Board of Trustees Northern Illinois University, 2010). At the time of the mass shooting, participants in the current study were participating in a study of sexual victimization that included assessments of their lifetime trauma histories and psychological distress. Participants also completed two online shooting-related surveys, one in the immediate aftermath of the shooting (*M* = 27 days following the shooting) and one approximately eight months post-shooting. Participants reported on their general distress and shooting-related PTSD in both surveys, as well as the extent to which they lost resources in the immediate aftermath of the shooting. The extent to which resource loss predicted shooting-related PTSD symptoms both in the immediate aftermath of the shooting and eight months post-shooting was examined after entering a number of other predictors of PTSD symptomatology in the model including demographic variables (age, ethnicity), exposure to the shooting, and general distress. In the model predicting initial PTSD symptomatology, pre-shooting distress was also included in the model, and in the model predicting eight month post-shooting PTSD symptomatology, initial PTSD symptomatology and post-shooting general distress were also included in the model. Thus, the current study represents the first to our knowledge to evaluate the extent to which psychosocial resource loss prospectively predicts PTSD symptomatology after controlling for a number of other predictors of symptomatology including pre-trauma adjustment and initial PTSD symptomatology.

Method

Participants and Procedure

Data were obtained from female participants who completed three waves of a longitudinal study. For the pre-shooting survey, 1,045 students currently enrolled in Introductory Psychology were recruited from a mass testing pool; participants were required to be women over the age of 18 years and fluent in English, and were not selected on the basis of trauma history or symptomatology. The pre-shooting survey (conducted between September 2006 and February 14, 2008) served as a baseline assessment for a longitudinal study of risk factors for sexual re-victimization. For the pre-shooting survey, participants completed a number of computer administered measures in an individual interview room over the course of approximately one hour and received course credit for participation. Of the 1,045 female participants who completed the pre-shooting survey, 885 (84.7%) consented to be contacted and were invited to participate in additional follow-up assessments.

Of the 885 potential participants, 812 (91.8% of 885 participants who consented to be contacted and 78% of the original 1,045 participants) were determined to be enrolled as a student at the university at the time of the mass shooting and were considered eligible for the post-shooting assessment. Seventeen days after the mass shooting event, participants were sent an email that contained an individualized link to an online shooting-related survey. Of those invited to participate, 691 (85%) completed the 30-minute online post-shooting survey. Participants had a number of weeks to complete the online survey and were sent several e-mail reminders. Non-responders were also contacted by telephone. Participants were compensated $40 for completion of the post-shooting survey.

The average time elapsed between completion of the initial survey and the mass shooting was 27 weeks (*SD* = 21 weeks), with a range from a few hours to 74 weeks. The initial post-shooting survey was launched March 2, 2008, (17 days following the mass shooting). The average time elapsed between the mass shooting and completion of the initial post-shooting survey was 27 days (*SD* = 12 days), and 80% of the sample completed the post-shooting survey within 40 days of the shooting. Approximately eight months after the mass shooting (*M* = 35 weeks since completing the initial post-shooting survey, *SD* = 3.1 weeks), the 691 participants from the post-shooting sample were contacted via email and invited to complete an additional online post-shooting survey. Five hundred eighty-eight (85%) participants completed the second 30-minute online post-shooting survey. Participants were again compensated $40 for completion of the survey and similarly had a number of weeks to complete it and were sent electronic and telephone reminders.

The average age of participants in the final sample (*n* = 691) was 19.4 years (*SD* = 2.5 years) at the time they completed the initial pre-shooting survey. Sixty-eight percent of participants self-identified as European American, 20% as African American, and 3% as Asian American. Seven percent of individuals indicated they were of a different ethnic background then listed and 1% chose not respond to the question. A separate item was administered to assess whether participants identified as Hispanic or Latina, with 7% of participants endorsing this item.

Measures

Pre-shooting survey measures

Lifetime trauma history: Pre-shooting exposure to potentially traumatic events was assessed using the Traumatic Life Events Questionnaire (TLEQ: Kubany, Haynes et al., 2000). The TLEQ is a brief, broad-spectrum measure of trauma exposure that has demonstrated good psychometric properties (Kubany, Haynes et al., 2000). Respondents indicate how often they have experienced 22 potentially traumatic events. If a potentially traumatic experience was endorsed, follow-up questions assessed the individual's emotional reaction, potential injury, and relationship to the perpetrator (when appropriate). Due to the initial study's focus on sexual re-victimization, the version of the TLEQ used in the current study was modified to specify the developmental period in which sexual abuse/assault occurred (e.g., before the age of 13 years, between the ages of 13 and 15 years, between the ages of 15 and 18 years, after the age of 18 years). TLEQ scores were calculated as the total number of potentially traumatic events experienced by participants where they also reported feelings of fear, hopelessness or horror during or after the event.

Psychological distress: The Depression Anxiety Stress Scale - 21 (DASS-21: Lovibond & Lovibond, 1995a) was administered during the pre-shooting and immediate post-shooting assessments to assess psychological distress. The DASS-21 is a brief measure of depression (7 items; e.g., I felt that I had nothing to look forward to), anxiety (7 items; e.g., I felt I was close to panic), and stress (7 items; e.g., I found it hard to wind down) symptoms. Each symptom is rated on a 4-point Likert scale ranging from 0 (*did not apply at all*) to 3 (*applied to me very much, or most of the time*) using *the past week* as a referent point. Subscale scores were obtained by computing a mean score for each of the items on the subscale. Prior research supports using the measure in non-clinical samples and supports the measure's factor structure (Lovibond & Lovibond, 1995b). In the current study, internal consistencies across assessments averaged .87, .78, and .83, for the depression, anxiety, and stress subscales, respectively.

Shooting-related survey measures

Exposure to the shooting: Participants were asked a number of yes/no questions about their direct exposure to aspects of the shooting (e.g., on campus, heard gunfire, saw individuals who had been wounded or killed in the shooting). These questions were based on a measure previously developed by Littleton and colleagues to assess college students' direct exposure to the 2007 Virginia Tech campus shooting (Littleton et al., 2009). Based on participants' responses to these items, they were classified into one of four exposure groups: no direct exposure, moderate direct exposure (on campus, saw police or other personnel surrounding the building), severe direct exposure (in the building during the shooting, saw individuals who had been wounded or killed in the shooting, heard gunfire), and extreme direct exposure (saw the gunman during the shooting, saw the gunman fire on others, fired on by the gunman). Two participants reported sustaining physical injuries (e.g., cuts from glass) in the shooting.

Posttraumatic stress symptoms: Posttraumatic stress symptoms related to the mass shooting event were assessed via the Distressing Events Questionnaire (DEQ; Kubany, Leisen, Kaplan, & Kelly, 2000). The DEQ is a 17-item self-report measure which assesses the severity of the 17 symptoms of PTSD (American Psychiatric Association, 2000) that the participant has experienced in the past 30 days. The DEQ assesses symptom severity using a 5-point Likert scale bounded by 0 (*absent or did not occur*) and 4 (*present to an extreme or severe degree*). For both post-shooting assessments, participants were instructed to answer the DEQ based on the mass shooting event. The DEQ has demonstrated very good psychometric properties (Kubany, Leisen et al., 2000), and internal consistency across assessments was excellent (α_s = .91 and .92).

Resource loss: Resource loss in the immediate aftermath of the shooting was assessed using 19 items drawn from the Conservation of Resources Evaluation (COR-E; Hobfoll, 2001). These 19 items had previously been used to assess resource loss following a major hurricane (Freedy, Kilpatrick, & Resnick, 1993). Items assessed loss of psychosocial resources (e.g., feeling valuable to others, time for adequate sleep, sense of humor) as well as loss of employment-related resources (e.g., stable employment, understanding from your employer/boss). For each item, participants were first asked if they had experienced any loss of that resource since the day of the campus shooting with the response options of yes, no, and prefer not to respond. For each resource that participants reported losing since the shooting, they were then asked to indicate the extent to which they had lost that resource since the shooting on a 3-point Likert scale anchored by 1 (*a little bit*) and 3 (*quite a bit*). If a participant did not report losing a particular resource following the shooting, his or her response to that item on the Likert scale was coded as a 0. Because no factor structure of this measure has been established, a principal axis factor analysis using a varimax rotation was conducted utilizing participants' responses to the Likert items. Results of the factor analysis supported that 16 of these items loaded on a single factor assessing loss of psychosocial resources. The remaining three items did not load on any factor and were eliminated from analyses. These items assessed loss of employment-related resources. Cronbach's alpha of the 16 remaining items was .93.

Procedures

Analysis Plan: To evaluate predictors of posttraumatic stress symptoms immediately post shooting, a linear regression was conducted using participants' scores on the DEQ at the immediate post-shooting assessment. Predictors were entered into the regression in blocks. Demographic variables were entered in the first block. The demographics entered were age in years as well as three race/ethnicity variables: Asian/Pacific Islander ethnicity, African/African American ethnicity, and Hispanic ethnicity. Pre-shooting trauma history (the total number of traumatic events reported on the TLEQ) was entered in the second block. Pre-shooting psychological distress scores (participants' mean item scores on the depression, anxiety, and stress subscales of the DASS at the pre-shooting assessment) were entered in the third block. Level of exposure to the shooting using three dummy coded variables was entered in the fourth block. The first of these dummy coded variables had moderate direct exposure to the shooting as the reference group, the second had severe direct exposure to the shooting as the reference group, and the third had extreme direct exposure to the shooting as the reference group. Resource loss following the shooting (total score on the 16 Likert-rated items on the COR-E) was entered in the final block.

A linear regression was similarly conducted to predict posttraumatic stress symptoms approximately eight months post-shooting using participants' total scores on the DEQ at the eight month post-shooting assessment. For this second regression, demographic variables were entered into the model in the first block. Pre-shooting trauma history was entered in the second block. To differentiate the influence of general distress from that of initial shooting-related PTSD symptoms, general psychological distress scores immediately post-shooting (participants' scores on the DASS at the immediate post-shooting assessment) were entered in the third block. Level of exposure to the shooting was entered in the fourth block. Posttraumatic stress symptoms reported at the immediate post-shooting assessment (participants' total scores on the DEQ at the immediate post-shooting assessment) were entered in the fifth block. Resource loss reported at the immediate post-shooting assessment was entered in the final block.

After conducting these regressions, a second set of linear regressions utilizing backward elimination were conducted using the same set of predictors of posttraumatic stress symptoms immediately post-shooting and eight months post-shooting. To conduct regressions using backward elimination, all potential predictors of the outcome variable are initially entered into the model. Then, predictors are deleted from the model, one at a time, based on which predictor would result in the smallest amount of change in variance explained when deleted. Predictors continue to be deleted from the model, one at a time, until deletion of any of the remaining predictors results in a meaningful reduction in variance explained (Pedhazur, 1997). This procedure yields a final model in which only predictors that meaningfully add to prediction of the outcome after taking into account all the other predictors in the model are retained.

Before conducting the regression analyses, potential collinearity among predictors was evaluated using the procedure recommended by Belsley and colleagues (Belsley, Kuh, & Welsch, 1980). This procedure involves first examining the condition index for each predictor. This number is the square root of the ratio of the first eigenvalue of the matrix and the eigenvalue of the predictor under consideration (Pedhazur, 1997). Belsley and colleagues (1980) suggest that condition numbers of 15 or greater are suggestive of possible problems with collinearity. Next, the variance-decomposition proportions of predictors with high condition indexes are evaluated. These refer to the proportion of variance of the intercept and each of the regression coefficients associated with the predictor. Belsely and colleagues (1980) suggest that the presence of variance proportions above 0.5 for two or more coefficients support the presence of collinearity. Before conducting the collinearity analyses, all predictor variables were scaled by dividing each score by the square root of the sum of squares value of the variable to enable evaluation of the condition indexes (Pedhazur, 1997).

Results

Participant flow and missing data

To assess differences due to attrition between the pre-shooting and immediate post-shooting assessments, those completing the post-shooting assessment (n = 691) were compared to eligible non-responders (n = 121) on demographics, pre-shooting trauma history, and pre-shooting psychological distress utilizing Bonferroni-adjusted t-tests and chi square analyses. No significant differences were found between women who completed the immediate post-shooting survey and those who did not. Examining women who completed the eight month post-shooting survey (n = 588) and those who did not (n = 103), one significant difference emerged. Specifically, women who did not complete the eight month survey were significantly more likely to be African American than those who completed this survey, $\chi^2(1) = 16.17$, $p < .05$ (35% versus 18%). No other significant differences emerged on any study variables among women who completed the eight month post-shooting survey and those who did not.

Missing data was minimal overall. Missing data ranged from 0% to 2% (immediate post-shooting PTSD symptomatology). Participants with missing data on a particular variable were eliminated from analyses utilizing that variable.

Exposure, PTSD symptoms, and loss following the shooting

The majority of participants reported direct exposure to the shooting, with 83.5% reporting some degree of direct exposure. Specifically, 60.2% reported moderate direct exposure (e.g., on campus, saw police or other personnel surround the building), 21.7% reported severe direct exposure (e.g., in the building during the shooting, saw individuals who had been wounded or killed), and 1.6% reported extreme direct exposure (e.g., saw the gunman during the shooting, was fired on by the gunman).

PTSD symptoms were common at the immediate post-shooting assessment with 95% of participants reporting some degree of PTSD symptomatology. In addition, 48% scored above 18 on the DEQ, reporting sufficient symptoms to suggest they met diagnostic criteria for shooting-related PTSD (Kubany, Leisen et al, 2000). A sizable percentage of participants continued to report PTSD symptomatology at the eight month post-shooting assessment, with 80% of participants reporting some degree of PTSD symptomatology. In addition, 12% reported sufficient symptoms to suggest they met diagnostic criteria for shooting-related PTSD.

Psychosocial resource loss following the shooting was also common, with 93.5% of participants reporting some degree of resource loss. On average, participants reported some loss of 4 of the 16 types of resources assessed. The most frequently reported lost resources were: motivation to get things done (52%), time for adequate sleep (50%), feeling that your life is peaceful (47%), and sense of optimism (40%).

Prediction of PTSD symptomatology

Descriptive statistics of variables used in the regression analyses are summarized in Table 1. Before conducting the regression predicting immediate post-shooting posttraumatic symptomatology, potential problems with collinearity were evaluated through examination of the condition indexes and variance decomposition proportions. Results of these analyses did not support evidence of problems with collinearity, and thus the regression analyses were conducted.

First, a linear regression was conducted to predict posttrauma symptoms immediately post-shooting, entering predictors in blocks. The result of the first step of the regression using demographic variables to predict immediate post-shooting posttrauma symptoms was non-significant, F (4, 654) = 1.51, p = .20. Number of pre-shooting trauma exposures was added at step two and the overall regression was significant, F (5, 653) = 11.60, p < .005, as was the R^2 change, F (1, 653) = 51.45, p < .005. Adding pre-shooting distress into the model at step 3, similarly resulted in a significant regression, F (8, 650) = 12.52, p < .005, as well as a significant R^2 change, F (3, 650) = 13.00, p < .005. Level of exposure to the shooting was added into the model at step 4. This regression was significant overall, F (11, 647) = 14.31, p < .005, as was the R^2 change, F (3, 647) = 16.67, p < .005. Finally, the regression at step five adding in post-shooting resource loss was significant, F (12, 646) = 32.41, p < .005, as was the R^2 change, F (1, 646) = 186.46, p < .005. Results of this regression are summarized in Table 2.

A linear regression with backward elimination was then conducted with all potential predictors of immediate posttrauma symptomatology entered into the model. The final step of this model included African American ethnicity, pre-shooting trauma exposure, pre-shooting stress, shooting exposure, and resource loss following the shooting, and was statistically significant, F (7, 651) = 55.14, p < .001. This model explained 37% of the variance in posttrauma symptoms. Results of the final step of this regression are summarized in Table 3.

A linear regression was then conducted predicting posttrauma symptoms at the eight month post-shooting assessment, entering predictors in blocks. The result of the first step of the regression using demographic variables to predict post-shooting posttrauma symptoms was non-significant, F (4, 558) = 2.08, p = .08. Number of pre-shooting trauma exposures was added at step two and the overall regression was significant, F (5, 557) = 10.54, p < .005, as was the R^2 change, F (1, 557) = 43.78, p < .005. Adding immediate post-shooting distress into the model at step 3, similarly resulted in a significant regression, F (8, 554) = 29.35, p < .005, as well as a significant R^2 change, F (3, 554) = 55.53, p < .005. Level of exposure to the shooting was added into the model at step 4. This regression was significant overall, F (11, 551) = 25.21, p < .005, as was the R^2 change, F (3, 551) = 10.25, p < .005. Immediate post-shooting posttrauma symptomatology was added to the model at step 5. Again, the regression was significant overall, F (12, 550) = 28.81, p < .005, as was the R^2 change, F (1,

550) = 40.81, $p < .005$. Finally, the regression at step six adding in immediate post-shooting resource loss was significant, F (13, 549) = 27.23, $p < .005$, as was the R^2 change, F (1, 549) = 10.20, $p < .005$. Results of this regression are summarized in Table 4.

A linear regression with backward elimination was then conducted with all potential predictors of eight month post-shooting posttrauma symptomatology entered into the model. The final step of this model included Asian ethnicity, pre-shooting trauma exposure, post-shooting anxiety, extreme shooting exposure, immediate post-shooting posttrauma symptoms, and resource loss following the shooting, was statistically significant, F (6, 556) = 57.56, $p < .001$, and explained 38% of the variance in posttrauma symptoms. Results of the final step of this regression are summarized in Table 5.

Discussion

Results of the current study add to the growing literature supporting the importance of resource loss in predicting adjustment following traumatic events. Results supported that resource loss in the aftermath of a campus shooting predicted PTSD symptoms among college women both in the immediate aftermath of the shooting as well as in the longer-term (eight months post-shooting). Importantly, resource loss continued to predict PTSD symptomatology when a number of other pre- and post-trauma factors were entered into the models including demographics, previous trauma exposure, pre-trauma adjustment, level of exposure to the shooting, post-shooting general distress, and initial PTSD symptomatology. In addition, unlike most prior studies of resource loss post-trauma, the current study focused on loss of psychosocial resources in predicting posttrauma adjustment. Thus, the current study advances the literature on COR theory in a number of ways. First, results support that psychosocial resource loss *prospectively* predicts PTSD symptomatology. Second, results support that resource loss predicts PTSD symptomatology above that of a number of other pre- and posttrauma factors, including demographics, prior exposure to trauma, level of exposure to the shooting, and initial distress and initial PTSD symptomatology. Finally, results support that psychosocial resource loss predicts symptomatology, even though the trauma did not result in substantial material resource loss.

While not the focus of the current study, it should also be noted that results supported prior research on posttrauma adjustment with regard to predictors of PTSD symptomatology (e.g., Brewin, Andrews, & Valentine, 2000; Ozer, Best, Lipsey, & Weiss, 2003). Specifically, results supported the cumulative nature of trauma, with the number of prior traumas experienced predicting PTSD symptomatology both immediately post-shooting and eight months post-shooting. In addition, experiencing stress symptoms (e.g., irritability, tension, difficulty relaxing) prior to the shooting predicted PTSD symptomatology. Of note, these findings are prospective in nature, as opposed to relying on retrospective reports of these variables after the index event occurred, as is the case with much prior research (Ozer et al., 2003). Results also supported that level of exposure to the shooting predicted symptomatology, although it should be noted that only extreme exposure to the shooting (e.g., being fired upon or witnessing the gunman fire on others) predicted PTSD symptomatology in the longer term. Initial PTSD symptoms and post-shooting anxiety also predicted longer-term post-shooting symptoms. Finally, there was some evidence that ethnic minority women may have been somewhat more vulnerable to experiencing PTSD symptomatology after the shooting.

Limitations of the current study should be noted. First, the current study involved a sample of college women who participated in a prior study of sexual victimization, and thus may not generalize to the university population as a whole. However, it should be noted that participants were recruited from Introductory Psychology courses which tend to draw students from multiple disciplines and that the only criteria for initial participation eligibility was being a female over the age of 18 years enrolled in this course. In addition, individuals with the most severe levels of exposure to the shooting (e.g., those who were wounded in the shooting, those who were fired upon) were underrepresented in the sample, and thus the findings may not generalize to those individuals most severely exposed to the incident. Finally, the results in the current study utilized self-report data and were not supplemented with clinical interviews.

Bearing these limitations in mind, findings from the current study have a number of implications for intervention and research in the area of mass trauma. First, findings support a growing body of literature (e.g., Blanchard et al., 2004; Littleton et al., 2009; North et al., 1994; Schwarz & Kowalski, 1991; Silver et al., 2004) that these incidents truly should be considered mass traumas, affecting whole communities, and not just those most severely exposed. Indeed, 80% of participants reported continued shooting-related PTSD symptoms eight months after the shooting, with 12% still reporting sufficient symptoms to suggest they met diagnostic criteria for PTSD. Thus, many individuals are potentially in need of intervention following mass trauma incidents and may still be in need of services many months afterward. In addition, loss of psychosocial resources following a mass trauma appears to be a potentially highly important risk factor for experiencing initial and long-term adjustment difficulties. Thus, interventions focused on helping individuals restore psychosocial resources in the aftermath of a mass trauma may be particularly helpful.

With regard to future research on mass trauma, results clearly support that resource loss is an important construct in understanding individuals' adjustment following traumatic events and thus should be included in future theoretical models. Results also support that research should focus on loss of psychosocial resources, as well as material losses, in affecting posttrauma adjustment. This may be particularly salient in understanding individuals' adjustment following traumatic events that are unlikely to result in substantial loss of material resources among those affected. In addition, in traumas where individuals potentially have lost both material and psychosocial resources, the extent to which each of these types of losses separately contributes to poor adjustment should be evaluated, as opposed to combining all types of losses into one measure, as in previous research. Finally, given the importance of psychosocial resource loss in predicting posttrauma adjustment, future research should focus on identifying factors that place individuals at risk for experiencing psychosocial resource loss after mass traumatic events. Research in these areas has the potential to increase our understanding of adjustment patterns following mass trauma events and how to effectively reduce the mental health burden of these tragedies.

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