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**The September 11th Attacks on America:
Relationships Among Psychological Distress,
Posttraumatic Growth, and Social Support
in New York**

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Abstract

This study examined psychological functioning, resiliency, and posttraumatic growth three weeks after the September 11th attacks on America. The participants were 414 (150 men, 265 women) students attending three universities in New York. They completed an anonymous and confidential questionnaire assessing demographic characteristics, acute stress disorder symptoms, posttraumatic growth, resource losses and gains, and social support. Most of the participants were concerned about future attacks. Acute stress disorder symptoms were associated with being female, fear for safety, anger, depression, posttraumatic growth, social support, community involvement, and somatic problems. Most participants reported posttraumatic growth or resiliency (viz. reassessment of life priorities and personal strength). The findings support the conservation of resources stress theory (Hobfoll, 1989; 1998) and posttraumatic growth theory (Calhoun & Tedeschi, 2001; Tedeschi & Calhoun, 1995). Implications of the findings and future research directions are discussed.

Introduction

On September 11, 2001, the world community was shocked when terrorists hijacked and crashed four passenger jet airplanes in the United States. The loss of life and magnitude of the attacks were unprecedented. The attacks killed all persons aboard each plane, 2,825 people from over 75 countries who were working in and around the World Trade Center towers, including Police Officers, Fire Fighters, and other rescue personnel, and two dozen persons in Washington, D. C. (New York Times, 2002).

This study examined psychological distress, coping, social support, and posttraumatic growth, three weeks after the attacks. At that time, Americans and the world community had many concerns that were compounded by ambiguity and uncertainty. Would other terrorists attack? If so, when, where, and by what means? When would the persons responsible be identified and brought to justice? What could be done to help citizens cope and respond to the attacks and to ensure their safety?

The project was guided by theory and research examining responses to catastrophic stressors. The attacks have a number of characteristics in common with other catastrophic stressors—such as natural and technological disasters, military combat experience, and life-threatening assaults—but also have unique features. Like other large-scale catastrophic events, the attacks affected a large number of people, occurred suddenly, were difficult to predict, exposed many people to horror, appeared to be beyond the control of any one person, threatened life and the lives of family members and friends, and placed excessive demands on coping (Baum, 1991; Lazarus & Cohen, 1977; Sattler, Freedy, Anderson, & Kaiser, 1997). Research suggests that many of these characteristics are associated with survivors' reporting that they feel some loss of their sense of control, predictability, safety, and trust (Baum, 1991; Updegraff & Taylor, 2000). The attacks were unique in that they were deliberate acts intended to inflict harm, created uncertainty concerning future attacks and when the responsible individuals and organizations would be brought to justice, and prompted an extensive response from the United States government both domestically and internationally to locate members of terrorist organizations and prevent future attacks. In addition, citizens throughout the United States felt directly affected and at risk.

Theories of Psychological Responses to Traumatic Events

The conservation of resources stress theory (Hobfoll, 1989; 1998) and the theory of posttraumatic growth (Calhoun & Tedeschi, 2001; Tedeschi & Calhoun, 1995) offer useful frameworks for understanding responses to the attacks. The conservation of resources stress theory suggests that people build and retain resources to enhance the self and maximize positive reinforcement. The theory predicts that psychological stress occurs when there is a threat of resource loss, loss of resources, or lack of resource gain following investment of resources (Hobfoll, 1989). Four resource types are identified: condition (e.g., marriage, employment, or other social roles), personal characteristic (e.g., age, knowledge, locus of control, self-esteem, skills), energy (e.g., money, insurance), and object (e.g., house, car, or other physical possessions). The theory also predicts that, in time, people may experience resource gains or positive outcomes. For example, survivors may learn about the value of preparation, learn new coping skills, and develop an enhanced sense of self-efficacy (Calhoun & Tedeschi, 1998; Monnier & Hobfoll, 2000; Sattler, Kaiser, & Hittner, 2000).

Posttraumatic growth theory expands on the conservation of resources stress theory by exploring how survivors of traumatic events might experience or perceive resource gains or growth. Growth may involve views of the self, relationships, and philosophy of life. For example, growth concerning views of the self may include learning about one's vulnerabilities, the value of preparation, and new problem solving skills; and developing an enhanced sense of self-efficacy or self-reliance. Growth concerning relationships may involve a deepening appreciation of relationships, increasing self-disclosure and emotional expressiveness, and being more willing to accept help from others. Changes in philosophy of life may include an increased appreciation for life and stronger spiritual beliefs (Calhoun & Tedeschi, 2001; Monnier & Hobfoll, 2000; Sattler et al., 2000; Tedeschi & Calhoun, 1995). These growth responses may help survivors balance out and cope with some of the negative outcomes. Calhoun and Tedeschi (2001) also speculate that the changes are fundamental, represent a new way of viewing the world, and endure for years (cf. Taylor, 1983).

Focus of the Present Study

The present study examined the relationships among psychological distress, resource losses and gains, posttraumatic growth, social support, and depression. Symptoms associated with acute stress disorder were measured to assess psychological distress. Acute stress disorder is related to posttraumatic stress disorder, though its duration is shorter, lasting for a minimum of two days and a maximum of four weeks after the traumatic event. DSM-IV-TR diagnostic criteria for acute stress disorder include the following: (a) exposure to a life-threatening event in which the person experiences intense fear or feelings of helplessness and horror, and (b) either during or after the event the person displays dissociative reactions (e.g., subjective sense of numbing, emotional detachment), persistently reexperiences the event (e.g., recurrent images, thoughts, dreams), avoids stimuli that arouse memories of the event, and shows symptoms of anxiety or arousal (e.g., difficulty sleeping, irritability, exaggerated startle response). Several studies have documented dissociative and anxiety symptoms in the first months following exposure to a traumatic event (Classen, Koopman, Hales, & Spiegel, 1998; Sattler et al., 2002; Waelde, Koopman, Rierdan, & Spiegel, 2001). Few studies, however, have examined acute stress disorder symptoms following a terrorist attack (cf. Shalev, 1992; Tucker, Pfefferbaum, Nixon, & Dickson, 2000) or posttraumatic growth.

METHOD

Participants

The participants were 414 college students (150 men, 264 women) attending one of three colleges in Manhattan, Queens, and Garden City, New York. All colleges are between 2 to 15 miles from the World Trade Center site. The average age was 21 years, with a range from 18 to 79 years. Most participants were white (64%), followed by Latino American (13%), African American (8%), and Asian American (3%), and other (1%). Most were single (91%) and citizens of the United States (96%). About one-third (30%) were in New York City at the time of the attack. The participants did not receive any inducements to participate.

Materials

The survey was completely anonymous and confidential, and a cover letter described the purposes of the study. The first section of the questionnaire asked about demographic characteristics (6 items), actions taken since the attack (e.g., displayed the flag of the United States, donated money to charity, donated blood; 12 items), having a friend or family member who would participate in U. S. government's response to the attacks, concern that they or a close family member might lose a job as a result of the attacks, following the news about the situation,

whether they were in New York City at the time of the attacks, change in daily routine and activities as a result of the attacks, and religious involvement. Participants checked one of several possible choices that best reflected their experience or wrote in a number to indicate their answers.

The second section measured resource losses and gains as a result of the attacks. The 25 items were adapted from Freedy et al. (1994) and Sattler et al. (2002), and asked about condition resources (e.g., family stability, companionship), personal characteristic resources (e.g., sense of optimism, sense of humor, feeling that you have control over your life, feeling that your life has purpose), and energy resources (e.g., time for adequate sleep, motivation to get things done). Table 2 presents examples of the items. Participants were asked to indicate how much of the each item decreased, increased, or whether there had been no change, since the attacks. They used a 7-point scale (1 = quite a decrease, 2 = some decrease, 3 = little decrease, 4 = no change, 5 = little increase, 6 = some increase, 7 = quite an increase) to indicate their answers.

The third section assessed symptoms associated with acute stress disorder (17 items) and somatic problems (9 items). Table 1 presents examples of the acute stress disorder symptom items. Examples of somatic items include "I have had headaches," "I have had muscle pain," and "I have had a poor appetite." Participants used a 4-point scale (1 = not at all to 4 = quite a bit) to indicate their answers.

The fourth section assessed depression with 10 items from the Multiscore Depression Inventory (Berndt, 1986). Examples include "I usually feel full of energy," "I often feel bad about the things I have done," and "I often feel weak and tired." This section also included 19 items that asked about concern for future attacks (adapted from Sattler et al., 2002), posttraumatic growth (adapted from Tedeschi & Calhoun, 1996), and coping (adapted from Sattler, Sattler et al., 1995). Examples of items asking about concern for future attacks include "I am afraid that I might lose my life or be seriously injured because of a terrorist attack," and "I believe that future terrorist attacks in the United States won't be that bad." Examples of the posttraumatic growth items include "I have tried to grow as a person as a result of the experience," and "I have discovered that I am stronger than I thought I was." Examples of coping items include "I talk about the event with other family members or friends," and "I have let my emotions out." Participants used a 4-points scale (1 = not at all to 4 = quite a bit) to indicate their answers.

The fifth section asked about social support (5 items) and prior experience with traumatic events (5 items). The social support items asked participants if they had received support since the attacks. Examples include "Family members or friends offered to help me in some way," and "Family members or friends expressed interest and concern about my well-being." Participants used a 4-point scale (1 = not at all to 4 = quite a bit) to indicate their answers to these items. The traumatic events items asked participants if they were exposed to any of five traumatic events during their lifetime (e.g., serious accident, military combat experience, exposure to threatening chemicals or radiation, being attacked by someone who intended to inflict serious injury, some using force to have physical contact). Participants used a 2-point no/yes scale to indicate their answers.

Procedure

Participants completed the questionnaire in their classrooms. The questionnaire took about 20 minutes to complete. The response rate was 98%.

RESULTS

Descriptive Findings

Psychological distress. A principle component factor analysis with varimax rotation examined symptoms associated with acute stress disorder. Four factors with eigenvalues greater than one and with factor loadings greater than .55 emerged. Table 1 presents means and standard deviations for the items by factor. The arousal items had the highest means, followed by avoidance, sleeping difficulties, and numbing of general responsiveness. Note that all of the means were below 2, which represented "a little bit," and almost all of the standard deviations were below 1.00.

Resource gains and losses, and actions taken since the attack. A principal component factor analysis with varimax rotation examined the resource gains and losses measure. Six factors with eigenvalues greater than one and with factor loadings greater than .55 emerged. Table 2 presents the items and factor loadings. Factor one assessed condition resources ($\alpha = .80$), factor two assessed personal characteristic resources concerning life goals ($\alpha = .75$), factor three assessed personal characteristic resources concerning control and safety ($\alpha = .67$), factor four assessed religion ($\alpha = .87$), factor five assessed energy resources concerning finances ($\alpha = .49$), and factor six assessed energy resources concerning time ($\alpha = .43$). The first four factors had moderate to good reliability, but due to poor reliability the last two factors were not included in subsequent analyses.

Table 2 shows that most participants reported increases in condition resources, personal characteristic resources concerning life goals, and religious faith. Participants reported little or no change in energy resources. However, participants reported decreases in personal characteristic resources such as feelings of having control over one's life, safety, and security. Participants also reported increases in patriotism, spending time with loved ones, and family stability.

Table 3 shows that most participants reported posttraumatic growth, including having new priorities about what is important in their life, trying to grow as a result of the experience, and discovering that they are stronger than they thought they were. Table 3 also shows psychosocial responses. These items show that participants were concerned about the possibility of future attacks.

Table 4 presents descriptive information concerning actions taken since the attack. Most participants reported displaying the American flag and showing concern for someone they did not know. About half of the participants donated money to a charity. Less than one-fifth of the

participants tried to avoid places with a large number of people, volunteered to help an organization, or donated blood.

Predicting Psychological Distress

Measures of acute stress disorder symptoms, social support, and depression were created by summing the items on each scale. The reliability coefficients indicated the acute stress disorder symptoms scale ($\alpha = .90$) and social support ($\alpha = .88$) had good reliability, but the depression scale had poor reliability ($\alpha = .57$).

A hierarchical multiple regression analysis examined the importance of demographic characteristics, fear of future attacks, change in daily routine, anger, depression, posttraumatic growth, social support, actions taken since the attacks, and somatic problems in predicating acute stress disorder symptoms. The predictor variables were entered in nine blocks, based on the conservation of resources stress theory and previous research (Freedy et al., 1994; Sattler et al., 2002; Smith & Freedy, 2000).

The predictor blocks accounted for 69% of acute stress disorder symptom variance, $F(14, 360) = 58.33$, $p < .001$. Table 5 shows that every block of predictors accounted for a significant portion of the acute stress disorder symptom variance. For blocks that had more than one variable, the beta coefficients indicate that acute stress disorder symptoms were associated with being female, safety fears, and posttraumatic growth (life priorities and strength, motivation and purpose).

Summary and Discussion

Fear of future attack. Most of the college student participants were concerned about the possibility of future attacks and the proximity of such attacks to their home. The participants also were concerned for the safety of family, friends, and themselves.

Acute stress disorder symptoms. The common symptoms associated with acute stress disorder involved arousal (e.g., "get upset or angry easily", "get upset when exposed to events that remind me of the situation") and avoidance (e.g., "I avoid things that remind me of the situation").

Acute stress disorder symptoms were associated with demographic characteristics (viz., being female), fear of future attacks and safety fears, resource loss and gains, posttraumatic growth (viz., life priorities, motivation, and purpose), depression, and somatic problems, and actions taken to support the community since the attack.

Posttraumatic growth. Most participants reported some degree of posttraumatic growth. The areas of growth included the self, relationships with others, and philosophy of life. Participants reported reflecting on and reassessing their lives (e.g., having new priorities about what is important in their lives; trying to grow as a person as a result of the experience), and being resilient (e.g., discovering that they were stronger than they thought they were).

Actions taken. Many participants took positive action by showing concern for someone they did not know and showing unity by displaying the American flag, and donating money to charity.

These findings are especially important, given that the study was conducted only three weeks after the attacks, the participants were college students, and the samples were comprised of persons living in four distinct areas of the country.

Theory. The findings support conservation of resources stress theory (Hobfoll, 1989; 1998) and posttraumatic growth theory (Calhoun & Tedeschi, 2001; Tedeschi & Calhoun, 1995, and extend previous research (e.g., Freedy et al., 1994; Sattler et al., 2002; Smith & Freedy, 2000).

Future research directions. Secondary stressors continued for many months after the attacks. Secondary stressors include stressful life events, strains, and hassles that develop in the wake of a disaster, and can include delays in obtaining resources, employment difficulties, financial difficulties, and threats to one's safety. Secondary stressors can tax personal characteristic, energy, and condition resources, exacerbate the influence of preexisting stressors, and contribute to psychological distress and relationship difficulties (Baum, 1991, Norris & Uhl, 1993). Because these secondary stressors have been prolonged, it is possible that delayed mental health problems, as well as additional growth, may develop many months after the event. Understanding the nature and role of secondary stressors is critically important to intervention and recovery programs. Since these stressors continue to exist, research should continue to examine the mental health and psychological implications of the terrorist attacks and threats. An especially important issues concerns identifying which persons are most at risk of adjustment difficulties, which interventions may minimize or prevent adjustment problems, and which interventions are most helpful. It would be useful for studies to examine factors associated with growth and distress, including optimism, perceptions of control over life events, sense of self, preexisting vulnerabilities, and the characteristics of the situation.

Limitations of the study. This correlational study has limitations that are common in most disaster studies. Because participants were college students at select campuses, the findings may not generalize to all college students or to all Americans. The findings offer detailed information about how persons within a specific demographic group responded to the tragic event. We do not know about preexisting psychopathology amongst the participants. It is possible that a small proportion of participants were experiencing distress or living with a mental health issue prior to the attacks. If so, these issues may have been reflected, to some degree, in the participants' answers, and we cannot conclude with complete certainty that the levels of distress shown in the results are solely due to the attacks.

Table 1. *Acute Stress Disorder Symptoms and Somatic Problems, Means and Standard Deviations (N=414)*

Item	Mean	Standard Deviation
<i>Factor 1: Arousal</i>	-	-

I get upset and/or angry easily	1.84	1.04
I feel irritable or on edge	1.51	.79
I get upset when exposed to events that remind me of the situation	1.93	.98
I feel mixed up or disoriented	1.84	.90
Time seems to stand still to me	1.66	.83
<i>Factor 2: Sleeping Difficulties</i>	-	-
I have nightmares	1.46	.80
I have difficulty sleeping	1.61	.90
<i>Factor 3: Numbing of General Responsiveness</i>	-	-
I feel emotionally numb	1.46	.80
I have trouble feeling my emotions	1.38	.74
I have difficulty remembering important things about the situation	1.20	.56
<i>Factor 4: Avoidance</i>	-	-
I try not to talk about the situation	1.58	.89
I avoid things that remind me of the situation	1.73	.92
<i>Somatic and Other Problems</i>	-	-
I have had heart palpitations	1.12	.44
I have cried more	1.83	1.02
I have had headaches	1.68	.94

I have had intestinal problems	1.16	.49
I have had muscle pain	1.28	.64
I have had a poor appetite	1.46	.77
I have been smoking more	1.97	1.10
I have been drinking more alcohol or using substance	1.26	.67
I have had increased problems in relationships	1.26	.61

Table 2. Resource Losses and Gains as a Result of the Attack on America, Means and Standard Deviations (N=414)

Item	Mean	Standard Deviation
<i>Factor 1: Condition Resources</i>	-	-
Feeling closer to one or more family members	5.50	1.22
Feeling valuable to others	5.10	1.21
Feeling close to at least one friend	4.98	1.17
Appreciating each day	5.55	1.25
Knowing I can count on people in times of trouble	5.32	1.24
Companionship	4.87	1.16
<i>Factor 2. Personal Characteristic Resources/Life Goals</i>	-	-
Feeling that I'm doing the right thing with my life	4.51	1.27

Feeling that I'm accomplishing my goals	4.42	1.20
Feeling that my life has purpose	4.78	1.31
Motivation to get things done	4.63	1.27
<i>Factor 3. Personal Characteristic Resources/Control and Security</i>	-	-
Sense of humor	3.94	1.14
Feeling I have some control over my life	3.48	1.28
Personal sense of safety and security	3.15	1.55
Sense of optimism	4.00	1.37
<i>Factor 4. Religion</i>	-	-
Religious faith	4.89	1.26
Praying	5.01	1.25
<i>Factor 5. Energy Resources/Finances</i>	-	-
Financial status	3.89	.83
Stable employment	3.97	.90
<i>Factor 6. Energy Resources/Time</i>	-	-
Time for adequate sleep	3.48	.96
Free time	3.48	.86
<i>Miscellaneous Items</i>	-	-
Feeling patriotic	5.76	1.38

Spending time with loved ones	4.76	1.20
Family stability	4.44	1.20
Physical health	4.12	.83

Note: items were answered on a 7-point scale, where 1 = quite a decrease, 2 = some decrease, 3 = little decrease, 4 = no change, 5 = little increase, 6 = some increase, 7 = quite an increase.

Table 3. Posttraumatic Growth and Psychosocial Responses as a Result of the Attack on America, Means and Standard Deviations (N=414)

Item	Mean	Standard Deviation
<i>Posttraumatic Growth</i>	-	-
I have new priorities about what is important in my life	2.50	1.08
I have tried to grow as a person as a result of the experience	2.34	.93
I have discovered that I am stronger than I thought I was	2.24	.94
<i>Psychosocial Responses</i>	-	-
I feel angry	2.04	1.10
I have a new respect for people living in my community	2.45	1.06
I am afraid I might lose my life or be seriously injured because of a terrorist attack	2.25	1.07

I am afraid that a family member might lose his/her life or be seriously injured in a terrorist attack	1.59	1.06
I am confident that the government will eliminate terrorist attacks in the U.S.	2.28	.99
The recent attacks could have been prevented if the government had planned better	2.62	1.15
Future terrorist attacks in the U.S. won't be that bad	1.68	.89
Future terrorist attacks will be far away from my city and have very little impact on me	1.34	.67
More and more, I feel helpless in the face of what's happening in the world today	2.29	1.08

Table 4. Actions Taken Since the Attack (N=414)

Item	Percent
Displayed American flag	81
Showed concern for someone you did not know	59
Donated money to charity	48
Tried to avoid places with a large number of people	17
Participated in community activities	15
Cancelled travel plans	13
Volunteered to help an organization	10

Other	10
Donated blood	5
Helped with rescue efforts	5
Bought safety equipment (gas mask, water purifier)	5
Enlisted for military service	1

Table 5. Prediction of Acute Stress Disorder Symptoms by Demographics, Fear of Future Attacks, Change in Daily Routine, Anger, Depression, Posttraumatic Growth, Social Support, Community Involvement, and Somatic Problems (N=414)

Variable	B	SE B	P
<i>Step 1: Demographics</i>	-	-	-
Gender	.23	.06	.21***
Age	.02	.00	.03
Prior Traumatic Exposure	.01	.03	.03
<i>Step 2: Fear</i>	-	-	-
Fear for Safety	.35	.03	.56***
Fear of Future Attacks	.04	.04	.05
<i>Step 3: Change in Routine</i>	.16	.03	.29***
<i>Step 4. Anger</i>	.15	.02	.31***
<i>Step 5. Depression</i>	.20	.05	.16***
<i>Step 6: Posttraumatic Growth</i>	-	-	-
Life Priorities and Strength	.23	.03	.34***

Importance of Relationships	.06	.01	.06
Motivation and Purpose	-.02	.01	-.17***
Step 7: Social Support	.06	.03	.09*
Community Involvement	.05	.02	.12**
Somatic Problems	.44	.04	.41***

Note: Step 1: $R^2 = .04$, $p < .001$; Step 2: $R^2 = .29$, $p < .001$; Step 3: $R^2 = .07$, $p < .001$; Step 4: $R^2 = .08$, $p < .001$; Step 5: $R^2 = .02$, $p < .001$; Step 6: $R^2 = .07$, $p < .001$; Step 7: $R^2 = .01$, $p < .05$; Step 8: $R^2 = .01$, $p < .001$; Step 9: $R^2 = .10$, $p < .001$.

References

- Baum, A. (1991). Toxins, technology, and natural disasters. In A. Monat & R. S. Lazarus (Eds.), *Stress and coping: An anthology* (3rd ed.; pp. 97-139). New York: Columbia University Press
- Berndt, D. J. (1986). *Multiscore depression inventory manual*. Los Angeles: Western Psychological Services.
- Calhoun, L. G., & Tedeschi, R. G. (2001). *Posttraumatic growth: The positive lessons of loss*. Washington, DC: American Psychological Association.
- Calhoun, L. G., & Tedeschi, R. G. (1998). Beyond recovery from trauma: Implications for clinical practice and research. *Journal of Social Issues*, Special Issue: Thriving: Broadening the paradigm beyond illness to health, 54 (2), 357-371.
- Classen, C., Koopman, C., Hales, R., & Spiegel, D. (1998). Acute stress disorder as a predictor of posttraumatic stress symptoms. *American Journal of Psychiatry*, 155, 620-624.
- Fredy, J. R., Saladin, M. E., Kilpatrick, D. G., Resnick, H. S., & Saunders, B. E. (1994). Understanding acute psychological distress following natural disaster. *Journal of Traumatic Stress*, 7, 257-273.
- Hobfoll, S. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, 44, 513-524.
- Hobfoll, S. E. (1998). *Stress, culture, and community: The psychology and philosophy of stress*. New York: Plenum Press.

Kaiser, C. F., Sattler, D. N., Bellack, D. R., & Dersin, J. (1996). A conservation of resources approach to a natural disaster: Sense of coherence and psychological distress. *Journal of Social Behavior and Personality*, 11, 459-476.

Lazarus, R. S., & Cohen, J. B. (1977). Environmental issues. In L. Altman & J. F. Wohlwill (Eds.), *Human Behavior and the Environment: Current Theory and Research* (pp. 89-127). New York: Plenum.

Monnier, J., & Hobfoll, S. (2000). Conservation of resources in individual and community reactions to traumatic stress. In A. Shalev, R. Yehuda, & A. C. McFarlane (Eds.), *International Handbook of Human Response to Trauma* (pp. 325-336). New York: Kluwer Academic/Plenum Publishers.

New York Times (2002), In cold numbers, a census of the Sept. 11 victims. Retrieved April 24, 2002, from <http://www.nytimes.com/2002/04/19/nyregion/19VICT.html>.

Norris, F. H., (1992). Epidemiology of trauma: Frequency and impact of different potentially traumatic events on different demographic groups. *Journal of Consulting and Clinical Psychology*, 60 (3), 409-418.

North, C. S., Nixon, S. J., Shariat, S., Mallonee, S., McMillen, J. C., Spitznagel, E. L. & Smith, E. M. (1999). Psychiatric disorders among survivors of the Oklahoma City bombing. *Journal of the American Medical Association*, 282 (8), 755-762.

Sattler, D. N., Freedy, J. F., Anderson, K., & Kaiser, C. F. (1997). Natural disasters and psychological adjustment: Implications of research for intervention efforts. *Journal of Psychological Practice*, 3, 113-127.

Sattler, D. N., Kaiser, C. F., & Hittner, J. (2000). Disaster preparedness: Relationship between prior experience, personal characteristics, and psychological distress. *Journal of Applied Social Psychology*, 30, 1398-1420.

Sattler, D. N., Preston, A., Kaiser, C. F., Olivera, V. E., Valdez, J., & Schlueter, S. (2002). Hurricane Georges: A cross-national study examining preparedness, resource loss, and psychological distress in the U. S. Virgin Islands, Puerto Rico, Dominican Republic, and the United States. *Journal of Traumatic Stress*, 15, 339-350.

Sattler, D. N., Sattler, J. M., Kaiser, C., Hamby, B. A., Adams, M., Love, L., Winkler, J. M., Abu-Ukkaz, C., Watts, B., & Beatty, A. (1995). Hurricane Andrew: Psychological distress among shelter victims. *International Journal of Stress Management*, 2, 133-143.

Shalev, A. Y. (1992). Posttraumatic stress disorder among injured survivors of a terrorist attack: Predictive value of early intrusion and avoidance symptoms. *Journal of Nervous & Mental Disease*, 180 (8), 505-509.

Smith, B. W., & Freedy, J. R. (2000). Psychosocial resource loss as a mediator of the effects of flood exposure on psychological distress and physical symptoms. *Journal of Traumatic Stress*, 13, 349-357.

Taylor, S. E. (1983). Adjustment to threatening events: A theory of cognitive adaptation. *American Psychologist*, 38, 1161-1173.

Tedeschi, R. G. & Calhoun, L. G. (1996). The posttraumatic growth inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress*, 9 (3), 455-472.

Tedeschi, R. G. & Calhoun, L. G. (1995). *Trauma and transformation: Growing in the aftermath of suffering*. Thousand Oaks, CA: Sage Publications, Inc.

Tucker, P., Pfefferbaum, B., Nixon, S. J., & Dickson, W. (2000). Predictors of post-traumatic stress symptoms in Oklahoma City: Exposure, social support, peritraumatic responses. *Journal of Behavioral Health Services & Research*, 27 (4), 406-416.

Updegraff, J. A., & Taylor, S. E. (2000). From vulnerability to growth: Positive and negative effects of stressful life events. In J. H. Harvey & Miller, E. D., *Loss and trauma: General and relationship perspectives* (pp. 3-28). Philadelphia, PA: Brunner-Routledge.

Waelde, L. C., Koopman, C., Rierdan, J., & Spiegel, D. (2001). Symptoms of acute stress disorder and posttraumatic stress disorder following exposure to disastrous flooding. *Journal of Trauma and Dissociation*, 2, 37-52.

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