POST-TRAUMATIC STRESS SYMPTOMS, COLLEGE ADJUSTMENT, AND DRUG USE IN RESPONSE TO TRAUMA AND THE SEPTEMBER 11TH ATTACKS

A Senior Honors Thesis

by

JENNIFER KAYE RECK

Submitted to the Office of Honors Programs
& Academic Scholarships
Texas A&M University
in partial fulfillment of the requirements of the

UNIVERSITY UNDERGRADUATE
RESEARCH FELLOWS

April 2003

Group: Cultural Studies 2

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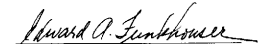
Approved as to style and content by:

Emily Davidson
(Fellows Advisor)



Edward A. Funkhouser
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April 2003

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ABSTRACT

Post-Traumatic Stress Symptoms,

College Adjustment, and Drug Use in Response to

Trauma and the September 11th Attacks. (April 2003)

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Traumatic life events can cause harmful mental health symptoms known as post-traumatic stress disorder (PTSD). Although not all people exposed to a trauma are diagnosed with PTSD, most experience some symptoms after a traumatic event. Even people who are far-removed from an event can experience PTSD symptoms. Trauma has also been found to make adjustment to college more difficult and increase drug and alcohol use. Previous trauma can also adversely affect one's reaction to traumatic events. Texas A&M undergraduate students (N = 149) were administered a questionnaire which included the Lifetime Involvement in Violent Events Survey (LIVES), the Substance Abuse Questionnaire, the Post Traumatic Stress Disorder Inventory (PTSD-I (SR)), the Hassles Assessment Scale for Students in College, the Brief COPE Scale, and scales which measured September 11th Exposure, PTSD symptoms, and loss of psychosocial resources. It was hypothesized that individuals exposed to previous trauma and the September 11th attacks would have high levels of PTSD symptoms, poor college

adjustment, and higher levels of drug use. Very few participants reported direct exposure to the events of September 11th, although more did show indirect exposure. Analyses showed that individuals who experienced violent events on the LIVES questionnaire showed higher levels of PTSD symptoms. Experiencing violent events also led to poor college adjustment and more alcohol use per setting. Gender differences revealed that women showed higher levels of sex threats and greater frequency of hassles, while men showed higher levels of alcohol per setting. Subjects who self-rated a traumatic event were significantly higher in all three categories of PTSD symptoms, avoidance, re-experiencing, and hyperarousal, than those who rated themselves as not having experienced trauma. Those who reported no trauma but had high emotional responses to an event they categorized as the worst thing that had ever happened to them also showed higher levels of PTSD symptoms than those with low emotional responses. Individuals exposed to September 11th also showed higher levels of PTSD symptoms and more loss of psychosocial resources.

ACKNOWLEDGMENTS

I would like to thank my advisor Dr. Emily Davidson for all of her encouragement and guidance throughout this whole process, and Shaun Torres for his help with coding the data. Also, a special thanks to John Gordy, the person who kept my schedule straight and kept me smiling through long nights of writing and preparing this paper. Finally, I would like to thank my parents Robert and Elaine Reck for their constant support in everything that I do.

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Introduction

Researchers have become increasingly interested in trauma and its effects upon individuals. Most of the initial research relating to trauma followed World War I and World War II, when psychologists began realizing that war veterans suffered many psychological effects, also known as combat fatigue or shell shock, upon their return from duty due to the events they had experienced during combat. A continuation of these symptoms following the Vietnam War led to the diagnosis of Post-traumatic Stress Disorder (PTSD) in these individuals (Langley, 1982; Lipkin, Scurfield, & Blank, 1983).

According to the Diagnostic and Statistical Manual for Mental Disorders – Fourth Edition Text Revision (2001), Post-Traumatic Stress Disorder can occur in individuals who have directly experienced a traumatic event, those who have had close contact with primary victims of an event, or those who feel that someone close to them may be threatened because of a traumatic event. Sprang (2001) found that symptoms of PTSD include feelings of intrusion, dormancy, and avoidance, which occur in irregular patterns. In order for PTSD to be diagnosed in an individual, the person must not only experience or witness an event which threatened or involved serious injury, but the individual must also respond to the event with intense fear, helplessness, or horror. These symptoms must last longer than a month. A related disorder that can be diagnosed if the above symptoms appear but last less than a month is Acute Stress Disorder.

This thesis follows the style and format of the *Journal of Abnormal Psychology*.

It is now realized that diagnosable PTSD also appears in individuals experiencing a wide range of traumatic events such as sexual assault and physical violence. Woods (2000) evaluated women who had been abused by their partners. The sample consisted of 53 abused women, 55 postabused women, and 52 nonabused women. Results showed that both abused and postabused women (the average postabused had been out of the relationship for nine years) experienced PTSD symptoms which rose with the severity of the abuse and risk of homicide. McCloskey and Walker (2000) showed that children who had been exposed to chronic abuse or traumatic events, such as family death or violence, exhibited Post-Traumatic Stress Disorder. Their sample consisted of 337 children aged six to twelve. About 25% of the children who had reported a traumatic event met the diagnostic criteria for PTSD. Witnessing trauma has also been shown to produce PTSD symptoms in a literature review by Warner and Weist (1996). They found that inner-city youth, including children and adolescents, who experienced high levels of violence showed symptoms of PTSD, depression, and anxiety.

Gender differences in PTSD symptoms have also been found. Zlotnick, Zimmerman, Wolfsdorf, and Mattia (2001) found, in a sample of 138 patients (mean age 35.48 years old) seeking treatment for PTSD, that women reported more reexperiencing symptoms than males, and they were more likely to meet the criteria for current PTSD. They also found that men with PTSD were more likely to abuse drugs than females with PTSD.

Research by McGruder-Johnson, Davidson, Gleaves, Stock, and Finch (2000) suggests that even middle class college students often have a history of trauma and

resulting symptoms. In a sample of 222 undergraduate students, about 40% reported direct exposure to a violent event, while 43% experienced a violent sexual encounter. Sexual traumas were reported more frequently by women, while nonsexual violent traumas were reported more frequently by men. This trauma can lead to ill effects on adjustment when a student enters college. In a study involving freshmen college women, Frazier and Schauben (1994) found that women who had experienced more traumatic stress had a harder time adjusting to college than those who had experienced little traumatic stress in their lifetimes.

Traumatic events can also lead to high levels of drug and alcohol use. Clark, Masson, Delucchi, Hall, and Sees (2001), with a sample of 150 dependent drug users (mean age = 43.7 years), reported that 29% of them met diagnostic criteria for PTSD. The occurrence of PTSD symptoms was associated with drug abuse severity. A study by Leeman and Wapner (2001) showed that college students who experienced stressful life events consumed greater amounts of alcohol than those who experienced few or no stressful life events. Although alcohol consumption may increase when people enter college, it may be due to previous traumatic stress rather than the stress of college adjustment.

Gender differences are also apparent when looking at alcohol and drug use independent of trauma. Gross (1993), in a study looking at the effects of alcohol use in 86 male and 141 female college students, found that males reported higher levels of alcohol consumption than females. He also found an interesting interaction among gender and age. Women under 21 reported higher alcohol consumption than women 21

and over, while the opposite was reported by men of the same ages. This may show that the pattern of alcohol use for men and women is different throughout their lifetimes. Concerning drug use, Hughes, Day, Marcantonio, and Torpy (1997), with a sample taken from the National Longitudinal Survey of Youth (NLSY), found that young men reported higher use of most drugs when compared to young women. They also found that gender differences emerged to a greater degree among racial groups.

Post-traumatic stress symptoms may occur in an individual who was indirectly exposed to a traumatic event. This is termed vicarious trauma. Most of the initial research on vicarious trauma focused on the effects of trauma upon therapists, hospital workers, and social workers who are exposed to continual secondary trauma in their place of work (Adams, Matto, & Harrington, 2001). Motta, Kefer, Hertz, and Hafeez (1999) evaluated two separate samples, college students (N=157) who had spent significant time with a traumatized family member, and mental health professionals (N=261) who treated large numbers of patients diagnosed with HIV and AIDS. Their results indicated that secondary stress symptoms can be aroused in individuals who were indirectly exposed to traumatic events.

The occurrence of symptoms of Post-Traumatic Stress Disorder in individuals can be triggered by many things including past experiences with trauma. People who have experienced past traumatic events are more likely to develop PTSD symptoms in the case of a new traumatic event when compared to those who have not previously experienced a traumatic event (McFarland, 1995; Brewin, Andrews, & Valentine, 2000).

Previous and vicarious traumas are especially important when looking at the effects of the September 11th attacks on individuals directly and indirectly exposed. Most of the current research on the September 11th attacks concerns individuals directly exposed to the events – they were present in New York or at the Pentagon when the attacks occurred – and concerns the effects of the attacks directly after the event. Schlenger, et. al (2002) drew a sample from the Knowledge Network's Web-enabled panel. E-mail questionnaires were sent to the panel 1-2 months after the terrorist attacks, and 2,273 individuals responded. Results showed that 11.2% of people in New York displayed probable PTSD 1-2 months following the attacks, and about 4% showed probable PTSD symptoms around the country. Schuster, et. al (2001) conducted a national phone survey of 560 adults 3-5 days after the attacks and found that 44% of the individuals surveyed reported substantial symptoms of stress, while 90% reported stress to some degree. Murphy, Wismar, and Freeman (2003), with a sample of 219 undergraduate African-American college students not directly exposed to the attacks, reported stress symptoms, academic problems, and fear three days following the event. They also found that later college year was a predictor of stress and academic problems.

Further studies looked at the effects of the September 11th attacks six months after the event. Piotrkowski and Brannen (2002), with a sample of 124 New York City workers, a mostly ethnic minority population, found that an estimate of 7.8-21.2% of the respondents had PTSD, based on their responses to the PTSD Checklist. Silver, Holman, McIntosh, Pulin, and Gil-Rivas (2002) sampled 787 individuals in the U.S. population outside of New York with a Web-based survey. Six months after the attacks, 5.8% of the

respondents showed symptoms of PTSD, with gender and severity of September 11th exposure to the attacks as some of the predictors. Web-based samples are not truly random samples, but are self-selected by the researcher. The subjects who respond to these online questionnaires may have more difficulties than those not responding because they may be seeking out these surveys during online searches.

Individuals who experienced previous trauma also showed higher levels of secondary trauma in response to the 9/11 attacks. Kinzie, Boehnlein, Riley, and Sparr (2002) found that 181 traumatized refugees from countries such as Vietnam, Cambodia, and Bosnia showed a strong reaction to the terrorist attacks, and those with previous PTSD showed even higher effects.

Other events similar to the September 11th attacks have produced similar effects in victims directly and indirectly exposed. Sprang (2001) found that of 244 adult individuals not directly affected by the Oklahoma City bombing, but living in Oklahoma at the time, 44 individuals experienced symptoms of PTSD six months after the bombing. Interviewing took place in intervals from six months to two years and revealed that PTSD symptoms decreased over time, with the most significant decline coming between six and nine months after the incident. Pfefferbaum, et al. (2000) found that 69 sixth-grade children who lived within 100 miles of Oklahoma City at the time of the bombings showed symptoms of PTSD two years after the incident, showing that children far removed from the event can display negative responses. The source of indirect exposure included the media coverage, for example, watching the traumatic event unfold on television or reading about it in the newspaper.

The purpose of this study was to assess the effects of trauma, especially the September 11th attacks, upon college students. Previous trauma in college students was predicted to increase responses to additional trauma (September 11th) and show higher levels of PTSD symptoms, poorer college adjustment, and higher drug use. Those who experienced no previous trauma, no rated trauma, low emotional response to trauma, and no exposure to 9/11 served as the comparison groups for the measures. Previous exposure to trauma served as an independent measure and the other variables, PTSD symptoms in response to the 9-11 attacks, drug use, and college adjustment, were dependent measures. Exposure to the 9-11 events was predicted to increase drug use, ill effects of college adjustment, and PTSD symptoms. Subjects' responses on the LIVES questionnaire were also analyzed (direct experience with violence versus no direct experience) and the two groups compared on PTSD symptoms, college adjustment, and drug use.

Method

Procedure

This study was reviewed and approved by the Institutional Review Board for Human Subjects. Each student signed a consent form informing them of the nature of the study. The students were also told that the study was completely voluntary and could be discontinued at any time without loss of research credit. The majority of the students completed the questionnaire in 30-45 minutes. Responses were placed in sealed envelopes to ensure anonymity. After completion of the questionnaire, students were given a debriefing form that provided them with further information about the study and numbers that they could call if they had any questions or concerns.

Participants

The sample in this study consisted of 149 college undergraduates at Texas A&M University. The participants were enrolled in Introductory Psychology and received course credit for participating in the study.

The mean age of the sample was 18.7 years with the majority of them (57.4%) being 18. Freshmen comprised the majority of the subjects (73.2%) while juniors and seniors only made up 6% of the sample. About 66% of the sample was female. For ethnicity, 53.8% categorized themselves as European-American while 33.8% classified themselves as "other." About 56% were from an urban hometown, almost 80% reported that their parents were married, and the majority of the subjects (67.8%) had parents who had a yearly income of at least $70,000 a year. Demographics are shown in Table 1.

Table 1

Demographics

Variables	N	%
Gender		
Male	50	33.6
Female	99	66.4
Ethnicity		
African-American	1	0.7
European-American	78	53.8
Mexican-American	11	7.6
Asian-American	4	2.1
Native-American	3	2.1
Other	49	33.8
Age		
18	85	57.4
19	43	29.1
20+	20	13.5
Classification		
Freshman	109	73.2
Sophomore	31	20.8
Junior/Senior	9	6.0

Variables	N	%
Hometown		
Urban	83	56.1
Rural	65	43.9
Parental marital status		
Single	10	6.8
Married	118	79.9
Divorced	16	10.8
Other	4	2.7
Parental yearly income		
Under $10,000-20,000	4	2.8
$21,000-40,000	11	7.5
$41,000-50,000	8	5.5
$51,000-60,000	17	11.6
$61,000-70,000	7	4.8
Above $70,000	99	67.8

Measures

All participants completed a 359-item self-report questionnaire composed of ten parts. All measures were approved by the Institutional Review Board (IRB).

Demographics Questionnaire. Subjects supplied background information including age, gender, ethnicity, and college classification. Questions were also asked about hometown size, parental marital status, and parental income.

Open-ended question. Subjects were asked, "Have you ever experienced something that is so horrible that it would be very distressing to almost anyone?" If the response was yes, the subjects were then also asked to describe the trauma, when and where it occurred, and other people that may have been involved. They were then asked to rate their levels of fear, helplessness, and horror on a scale from 1-9, with 1 being not at all and 9 being extremely fearful, helpless, or horrified. If the answer was no, the subjects were asked to describe the most terrible thing that ever happened to them and rate that response on the same scales from 1-9.

Two raters coded all the written responses using the DSM-IV definition for a traumatic event. The information was rated a trauma or not a trauma according to the DSM-IV criteria; experienced, witnessed, or heard about; and violent or non-violent. The rating was done blindly and independently, with the two raters then conferring to reach a final rating to be used for analyses. Inter-rater agreement (prior to conferencing) for whether the event was a trauma or not was 91.3% of 149 ratings.

Subjects' data were then analyzed using their emotional responses of fear, helplessness, and horror for the reported events. For those who answered "yes" to the

trauma question, the means of their responses for fear, helplessness, and horror were calculated. This mean was used to determine high responses for those who answered "no" to the trauma question. If the emotional responses for fear, helplessness, and horror were at or higher than the means of the emotional responses of the self-reported trauma individuals, then they were expected to have effects for PTSD, college adjustment, and drug and alcohol use at levels similar to the self-reported trauma individuals.

The PostTraumatic Stress Disorder Inventory (PTSD-I). This section of the questionnaire measured PTSD symptoms in response to a previous traumatic event. This interview was developed by Wastson, Juba, Manifold, Kucala and Anderson (1991) and converted to a questionnaire format. It was developed and validated with male combat veterans in psychiatric institutions. The PTSD-I uses the DSMIII-R criteria to measure the three sub-scales of diagnosis for PTSD, which include reexperiencing, avoidance, and hyperarousal. The symptoms were in statement form, and subjects responded in terms of the frequency they experienced each symptom, with 0 being "no/never," to 7 being "extremely/always." Carlson (1996) explained that this measure is useful because it accounts for onset, frequency and severity of symptoms.

Lifetime Involvement in Violent Events Survey (LIVES). Developed by McGruder, Stock, and Davidson (1995), the LIVES measured previous exposure to life threat and sex threat. The subjects were asked to indicate the number of times each event was directly experienced, witnessed, or heard about (excluding what they may have seen or heard about in the media). Categories of life threat events comprised 11 situations: held hostage, threatened with a gun, intentionally shot with a gun, threatened with a

knife or sharp object, intentionally stabbed with a knife or sharp object, mugged, chased by a gang, severely beaten, car-jacking, murder, and military combat. The sex threat events comprised four situations: forced sex play, attempted rape, forced sexual intercourse, and forced sex acts. LIVES results are shown in Table 2.

Hassles Assessment Scale for Students in College. Developed by Sarafino and Ewing (1999), this scale measured students' stress in college. Students were presented with 54 separate hassles that they may have experienced in the last month that would make them sometimes feel frustrated, anxious, or irritated. They were asked to report the levels of frequency of each hassle (0=never to 5=extremely often), the unpleasantness of each hassle (0=not at all to 4=extremely) and degree of dwelling upon each hassle (0=very little/not at all to 4=a great deal). Some of the hassles include bills, boredom, car problems, dating, and exams.

Brief COPE. This scale, developed by Carver (1997), is an abbreviated version of the COPE Inventory and was originally used to measure coping styles of recovering victims of Hurricane Andrew. Students were asked to describe a stressor that they had experienced since arriving at college. They were then presented with several items which offered different ways people cope with stress. They rated their responses from 1, "I haven't been doing this at all," to 4, "I've been doing this a lot."

Substance Use Questionnaire. Subjects were asked about their use of alcohol, tobacco, and drugs such as marijuana, cocaine, ecstasy, codeine without a prescription, and other drugs. Subjects were asked to indicate their frequency of use in the last six

Table 2

Exposure to Lifethreat

	Direct		Witnessed		Told about	
Lifethreat	N	%	N	%	N	%
Hostage	1	0.7	5	3.4	59	39.6
Threatened with gun	16	10.8	17	11.4	93	62.4
Shot with gun	2	1.3	9	6.1	62	41.6
Threatened with knife	17	11.4	24	16.1	80	53.7
Stabbed with knife	3	2.0	6	4.1	61	40.9
Mugged	3	2.0	13	8.7	87	58.4
Chased by gang	17	11.5	10	6.7	55	36.9
Beaten	11	7.4	27	18.2	92	62.2
Carjacked	3	2.0	1	0.7	54	36.5
Forced sex play	15	10.1	12	8.1	79	53.0
Forced attempted sex	5	3.4	3	2.0	56	37.6
Forced intercourse	4	2.7	2	1.3	59	39.6
Forced sex acts	3	2.0	0	0	33	22.1
Murder/ homicide	--	--	2	1.4	51	34.2
Military/ combat related	0	0	--	--	40	26.8

months and lifetime use by selecting choices that ranged from "not at all" to "forty or more times." Subjects also indicated tobacco use and caffeine use per day. Selected substance use data are presented in Table 3.

9/11 Attacks Module 1: Assessment of Exposure to the Events. Developed by Norris (2001) shortly after the attacks, this survey measured direct and indirect exposure to the September 11th attacks. Some of the items in this section included actual presence or having a family member present in New York or at the Pentagon during the attacks, evacuation from place of work or some other location, being stranded due to air travel, losing one's job or having a family member laid off, losing significant amounts of money, and being harassed because of ethnic heritage. Results of exposure to the September 11th attacks are shown in Table 4.

9/11 Attacks Module 2: Loss of Psychosocial Resources. Also developed by Norris (2001), this survey measured the way in which a major event can change the way people view themselves, other people, and the world in general. People were asked how true each statement was based on a scale from 1, not true at all, to 5, extremely true. Some of the items in the survey included such statements as "You feel less safe than you did before the disaster of September 11" and "You feel more pessimistic about your own future well-being."

PTSD Checklist – Terror for the September 11th Attacks. Added to the PTSD survey by the Office of Behavioral and Social Sciences Research (OBSSR; 2001), this questionnaire measured problems and complaints that people may experience as a result of the terrorist attacks. These questions were designed based on the DSM-IV diagnostic

criteria for PTSD and were specifically worded to apply to the September 11th attacks. They determine whether an individual has suffered from symptoms of PTSD in the last month due to the attacks.

Table 3

Drug Use

Drug use	N	%
Marijuana (last 6 months)		
Not at all	124	84.4
Just once or twice	10	6.8
Three to nine times	7	4.8
Ten to nineteen times	2	1.4
Twenty or more times	4	2.7
Marijuana (lifetime)		
Not at all	100	67.1
Just once or twice	10	6.7
Three to nine times	17	11.4
Ten to nineteen times	7	4.7
Twenty or more times	15	10.1
Alcohol (last 6 months)		
Not at all	35	23.5
Just once or twice	25	16.8
A few times	18	12.1
About once or a few times a month	21	14.1
About once or a few times a week	48	32.2
Almost daily	2	1.3

Drug use	N	%
Alcohol (per setting)		
I don't drink alcohol	32	21.5
Half a drink or one drink	24	16.1
Two or three drinks	27	18.1
Four to six drinks	42	28.2
Between seven and twelve drinks	18	12.1
Thirteen or more drinks	6	4.0

Table 4

September 11th Exposure

Exposure	N	%
Direct exposure	1	0.7
Family exposure	11	7.9
Evacuated from workplace	12	8.2
Stranded because air travel stopped	3	2.1
Loss of job (family)	2	1.4
Significant loss of money	28	19.2
Harassed because of ethnicity	2	11.8

Results

Internal Consistency

Coefficient alphas were calculated for the three subscales of the PTSD-I, the combined PTSD-I scales, the three subscales for the September 11th PTSD checklist, and the hassles college adjustment scale. The outcome measures were internally consistent for the PTSD-I scales and hassles scales, while two of the three September 11th PTSD symptoms were internally consistent, as shown in Table 5.

Self-Reported Trauma

The first analysis compared subjects who had answered that they had experienced a traumatic event to those who responded that they had not. For these purposes a 2 (trauma) X 2 (gender) MANOVA was conducted, with the three PTSD-I sub-scales, the three Hassles College Adjustment sub-scales, and marijuana and alcohol used as dependent variables. Results indicated significant main effects for trauma, Wilk's Lambda F (10, 133) = 2.17, $p<.02$, and for gender, Wilk's Lambda F (10, 133) = 2.40, $p<.01$, but no significant trauma X gender interaction, Wilk's Lambda F (10, 133) = 1.13, $p<.34$. Results of univariate analyses for trauma are shown in Table 6. In general, those who reported a trauma were experiencing significantly more PTSD symptoms than those who did not report a trauma. Lifetime marijuana use was marginally significant. They did not show more problems with college adjustment or alcohol. Results for univariate analyses for gender are shown in Table 7. Women were significantly higher on reexperiencing, hassle frequency, and hassle dwelled upon, and marginally significant on avoidance than men, while men were higher on alcohol use per

Table 5

Internal Consistency

Measure	Alpha	Mean	SD
PTSD-I Scales			
Reexperiencing*	0.84	2.62	1.19
Avoidance*	0.79	2.29	1.04
Hyperarousal*	0.81	2.11	1.09
PTSD symptoms*	0.90		
September 11th PTSD Scales			
Reexperiencing	0.47	1.34	0.36
Avoidance*	0.68	1.21	0.31
Hyperarousal*	0.74	1.20	0.33
Hassles Scales			
Hassle Frequency*	0.89	109.93	26.23
Hassle Unpleasantness*	0.92	83.50	27.31
Hassle Dwelled Upon*	0.93	54.52	27.44

Note. * indicates internal consistency.

Table 6

PTSD-I, Hassles, and Substance Use Scores by Self-Reported Trauma

	Trauma	No Trauma
	N=17	N=129
Variable	Mean	Mean
PTSD-I		
Reexperiencing*	3.57	2.49
Avoidance*	3.00	2.19
Hyperarousal*	2.96	1.99
Hassles scale		
Hassle frequency	110.29	110.50
Hassle unpleasantness	86.24	83.71
Hassle dwelled upon	58.12	54.29
Substance use scale		
Marijuana (last 6 months)	0.53	0.29
Marijuana (lifetime)$^{++}$	1.41	0.80
Alcohol (last 6 months)	2.65	2.83
Alcohol (per setting)	3.00	3.09

Note: *indicates significant effects for $p<.05$.

$^{++}$indicates marginally significant effects for $p<.10$.

Table 7

PTSD-I, Hassles, and Substance Use Scores by Gender

	Gender	
	Male	Female
	N=50	N=96
Variable	Mean	Mean
PTSD-I		
Reexperiencing*	2.30	2.78
Avoidance^{++}	2.09	2.39
Hyperarousal	1.99	2.16
Hassles scale		
Hassle frequency*	102.40	114.69
Hassle unpleasantness	80.20	85.99
Hassle dwelled upon*	48.10	58.19
Substance use scale		
Marijuana (last 6 months)	0.36	0.30
Marijuana (lifetime)	0.96	0.82
Alcohol (last 6 months)	3.16	2.63
Alcohol (per setting)*	3.76	2.73

Note: * indicates significant effects for $p<.05$.

$^{++}$ indicates marginally significant effects for $p<.10$.

setting than women. Women showed higher effects on all PTSD symptoms and all college adjustment measures, although only reexperiencing and hassle frequency and dwelled upon were significant.

Rated Trauma

After comparing the open-ended responses of those who reported a trauma to those who did not report a trauma, it was hypothesized that more than the 17 people who had reported a trauma had probably actually experienced a trauma. For this purpose, two raters rated the open-ended responses of all 149 questionnaires to determine how many people reported an event that could be considered a trauma according to the DSM-IV criteria. Blind, independent ratings followed by a conference of disputed answers revealed that 95 subjects had experienced a trauma according to the DSM-IV criteria. Subjects who were other-rated as having experienced a trauma according to DSM-IV criteria were then compared to those who had not experienced a trauma according to the DSM-IV criteria. For these purposes a 2 (other-rated trauma) X 2 (gender) MANOVA was conducted, with the PTSD-I, hassles subscales, and alcohol and marijuana use as dependent variables. Results indicated no significant main effects for trauma, Wilk's Lambda $F(10, 124) = 1.53$, $p<.14$, and no significant trauma X gender interaction, Wilk's Lambda $F(10, 124) = 0.62$, $p<.80$. Even though 95 people experienced a trauma according to the DSM-IV criteria, they did not show significant effects for PTSD as the 17 self-reported trauma individuals had. This indicates that even though many individuals experienced a trauma, only a small minority report them as a trauma, perhaps because they were more distressed and affected by the event.

No Reported Trauma with High Emotional Response

Because the rated trauma yielded no significant results, yet many people experienced a trauma that fit the DSM-IV criteria, it was hypothesized that fear, helplessness, and horror responses may have had an effect on experienced PTSD symptoms. If people rated high emotional responses for the worst thing that had ever happened to them, after responding that they did not experience a trauma, then they may also show symptoms of PTSD higher than those who did not report a high emotional response. The mean scores of those who self-reported trauma were used as the criteria for the no trauma responses: fear = 7.33, helplessness = 6.83, and horror = 7.88. For the individuals who did not report a trauma, if their responses for fear, helplessness, or horror were above the means for the reported trauma, they were expected to report higher levels of PTSD than those who reported low means. For this purpose, a multivariate analysis was conducted with no reported trauma with high emotional responses versus no reported trauma with low emotional responses. The individuals who had self-reported a trauma were removed from the analysis because almost all of them reported high responses for fear, helplessness, and horror. The analysis resulted in a significant main effect, Wilk's Lambda $F(10, 118) = 4.32$, $p<.0001$. Results of the analysis are shown in Table 8. Individuals who did not self-report a trauma, but had high responses on fearfulness, helplessness, and horror showed significantly higher levels of PTSD reexperiencing, avoidance, and hyperarousal when compared to the individuals who reported low emotional responses. Hassle frequency and marijuana use (lifetime and last 6 months) showed marginally significant effects.

Table 8

PTSD-I, Hassles, and Substance Use Scores by No Reported Trauma with High and Low Emotional Responses

	High responses	Low responses
	N=78	N=51
Variable	Mean	Mean
PTSD-I		
Reexperiencing*	2.86	1.92
Avoidance*	2.34	1.97
Hyperarousal*	2.26	1.57
Hassles scale		
Hassle frequency^{++}	113.55	105.84
Hassle unpleasantness	84.59	82.37
Hassle dwelled upon	56.56	50.80
Substance use		
Marijuana (last 6 months)$^{++}$	0.40	0.14
Marijuana (lifetime)$^{++}$	0.97	0.53
Alcohol (last 6 months)	2.83	2.82
Alcohol (per setting)	3.04	3.18

Note: * indicates significant effects for $p<.05$.

$^{++}$indicates marginally significant effects for $p<.10$.

A similar analysis was conducted with no self-reported trauma with high emotional responses and no self-reported trauma with low emotional responses. However, individuals who had experienced no trauma as rated by the raters according to DSM-IV criteria were removed along with the individuals who had self-reported trauma. Analyses showed similar effects in relation to the analysis with the no other-rated trauma. Exceptions included marginally significant effects for hassle dwelled upon and significant effects for lifetime marijuana use.

Coping

To determine the reason for the difference in those who did not self report trauma and had high emotional responses to those who did not report trauma and had low emotional responses, coping techniques were analyzed. First, those with self-reported trauma and no other rated DSM-IV trauma were eliminated. Then those with high emotional responses were compared to those with low emotional responses in two analyses – negative coping techniques and positive coping techniques. The analysis for negative coping resulted in a marginally significant main effect, Wilk's Lambda $F(4, 84) = 2.20$, $p<.08$. Those who had high emotional responses were significantly higher on self-blame and marginally significant on denial. The analysis for positive coping resulted in a marginally significant main effect, Wilk's Lambda $F(10, 78) = 1.84$, $p<.07$. Those who had high emotional responses were marginally higher on self distraction and significantly higher on positive reframing. Results of the analysis are shown in Table 9. Individuals who show high emotional responses are using more negative coping strategies that may account for their greater difficulty with traumatic events. These

Table 9

Coping for No Self-Reported Trauma High and Low Responses

Variable	High responses N=60 Mean	Low responses N=29 Mean
Negative coping		
Self blame*	5.05	3.86
Behavioral disengagement	2.90	2.76
Denial^{++}	2.78	2.31
Substance use	2.80	2.62
Positive coping		
Self-distraction^{++}	5.25	4.66
Active coping	5.57	5.14
Use of emotional support	5.30	4.90
Use of instrumental support	4.98	5.14
Venting	4.28	3.90
Positive reframing*	5.85	4.79
Planning	5.83	5.45
Humor	4.58	4.76
Acceptance	5.92	5.52
Religion	5.78	5.38

Note. * indicates significant effects for $p<.05$.

$^{++}$ indicates marginally significant effects for $p<.10$.

individuals are also using positive coping strategies such as distraction and positive reframing more often. We had expected that those individuals with low emotional responses would report higher coping, yet the results revealed the opposite – those with high responses reported more coping. This may be because these people had more stress and more reasons to use coping strategies.

LIVES Trauma

The LIVES asked about the occurrence of multiple violent events, including sexual trauma. Subjects reported how many times they had experienced a certain trauma either directly, by witnessing it, or by being told about it. A MANOVA for the LIVES scores for direct lifethreat (including sex threat) versus no direct lifethreat resulted in a significant main effect, Wilk's Lambda $F(10, 133) = 4.03$, $p<.0001$. Multivariate analysis revealed that those who experienced a lifethreat were more likely to exhibit reexperiencing, avoidance, and hyperarousal symptoms, to have a higher frequency of college hassles, and to drink more alcohol per setting than those who did not report a lifethreat. Means are showed in Table 10.

September 11th Exposure

Subjects were asked about their level of exposure to the September 11th attacks, including questions such as if they or their families were present during the attacks, and if they or any immediate family members lost jobs or money due to the attacks. Only one person was directly exposed to the attacks, and 11 had family members that were exposed. The main exposure for our sample included individuals who had lost or had a family member that lost a significant amount of money. Individuals may have reported

Table 10

PTSD-I, Hassles, and Substance Use Scores by LIVES Direct Trauma

Variable	Violent trauma N=44 Mean	No violent trauma N=102 Mean
PTSD-I		
Reexperiencing*	3.06	2.42
Avoidance*	2.77	2.08
Hyperarousal*	2.69	1.85
Hassles scale		
Hassle frequency*	120.75	106.05
Hassle unpleasantness	89.09	81.81
Hassle dwelled upon^{++}	60.39	52.29
Substance use		
Marijuana (last 6 months)	0.50	0.25
Marijuana (lifetime)	1.14	0.75
Alcohol (last 6 months)	3.20	2.64
Alcohol (per setting)*	3.73	2.80

Note: * indicates significant effects for $p<.05$.

$^{++}$ indicates marginally significant effects for $p<.10$.

more than one kind of trauma. For these purposes a 2 (any September 11th exposure) X 2 (gender) MANOVA was conducted, with the PTSD-I, hassles subscales, alcohol and marijuana use, September 11th PTSD measures, and loss of psychosocial resources as dependent variables. Results indicated marginally significant main effects for exposure, Wilk's Lambda F (10, 133) = 1.75, $p<.075$, and significant effects for exposure X gender interaction, Wilk's Lambda F (10, 133) = 2.95, $p<.0023$. Results of multivariate analyses for exposure are shown in Table 11. In general, those who reported exposure were experiencing more PTSD symptoms than those who did not report exposure, both for the PTSD-I and the September 11th PTSD questionnaires, with reexperiencing being marginally significant for PTSD-I and avoidance and hyperarousal being significant for the September 11th PTSD scale. They showed significant effects for loss of psychosocial resources; they also showed poorer college adjustment and higher drug and alcohol use, with hassle frequency and alcohol use per setting being marginally significant. Results of multivariate analyses for exposure X gender are displayed in Table 12. Analyses of the interactions have not yet been completed.

Table 11

PTSD-I, College Adjustment, and Substance Use Scores by All September 11th Exposure

Variable	Exposure N=39 Mean	No exposure N=107 Mean
PTSD-I		
Reexperiencing++	2.98	2.48
Avoidance	2.38	2.25
Hyperarousal++	2.36	2.01
PTSD symptoms for 9/11		
Reexperiencing++	1.42	1.30
Avoidance*	1.30	1.18
Hyperarousal*	1.32	1.16
Loss of psychosocial resources*	2.10	1.72
Hassles scale		
Hassle frequency*	117.49	107.93
Hassle unpleasantness++	90.21	81.75
Hassle dwelled upon	59.46	53.01

Variable	Exposure N=39 Mean	No exposure N=107 Mean
Substance use		
Marijuana (last 6 months)	0.36	0.31
Marijuana (lifetime)	1.00	0.82
Alcohol (last 6 months)	2.87	2.79
Alcohol (per setting)*	3.69	2.86

Note: * indicates significant effects for $p<.05$.

$^{++}$ indicates marginally significant effects for $p<.10$.

Table 12

PTSD-I, Hassles, and Substance Use Scores by September 11th Exposure and Gender

	Exposure		No Exposure	
	Men	Women	Men	Women
	N=18	N=21	N=18	N=21
Variable	Mean	Mean	Mean	Mean
PTSD-I				
Reexperiencing	2.50	3.39	2.18	2.61
Avoidance	2.06	2.66	2.11	2.31
Hyperarousal	2.21	2.49	1.86	2.07
Hassles scale				
Hassle frequency	105.72	127.57	100.53	111.08
Hassle unpleasantness	86.22	93.62	76.81	83.85
Hassle dwelled upon	53.22	64.81	45.22	56.33
Substance use				
Marijuana (last 6 months)*	0.78	0	0.13	0.39
Marijuana (lifetime)*	1.78	0.33	0.50	0.96
Alcohol (last 6 months)	3.06	2.71	3.22	2.60
Alcohol (per setting)	3.61	3.76	3.84	2.44

Note: * indicates significant effects for $p<.05$.

Discussion and Conclusions

These data suggest the effects of trauma and the September 11th attacks on symptoms of PTSD, college adjustment, and drug and alcohol use. In general, individuals did not report traumatic events in their lives, although the majority of them (63.8%) had experienced a trauma according to the DSM-IV criteria. Individuals who self-reported a trauma showed higher levels of PTSD symptoms than those who did not, and those who reported violent events in the LIVES also showed higher levels of PTSD symptoms, as well as poor college adjustment and increased alcohol consumption.

Initial analyses of other-rated trauma produced no significant effects for PTSD symptoms, college adjustment, or drug use. Those who self-reported a trauma recognized their responses as traumatic. Many individuals reported high emotional responses of fear, helplessness, and horror for an event they described as not a trauma. Most of these responses were also rated as a trauma by DSM-IV criteria, and were compared to the individuals who reported low emotional responses. The individuals who reported high emotional responses to their no trauma response showed high levels of PTSD symptoms, but no significant effects for college adjustment or drug use. They are responding to the trauma with PTSD symptoms, yet their daily lives are not disrupted, i.e., they do not use more drugs or have a hard time with college adjustment. This effect was also found for those who self-rated a trauma.

As for gender differences, women reported more sexual traumas than men, and they also showed more symptoms of PTSD and poorer college adjustment than men. However, men were generally higher on alcohol consumption, including frequency and

drinks per setting. Of the 149 participants, only five were 21 years of age or older, indicating the high level of underage drinkers in this college sample. When looking at the September 11th attack exposure data and gender, females showed levels of alcohol use at similar levels than male alcohol use, perhaps indicating that trauma has a greater effect on female alcohol consumption than on alcohol consumption by men, as the men actually consumed less alcohol per setting.

The September 11th data displayed the effects that the terrorist attacks had on individuals far removed from the events. About 25% of the participants were affected in some way by the September 11th attacks, the most prevalent exposure being loss of money due to the attacks. This exposure led to an increase in PTSD symptoms and loss of psychosocial resources. It is important that researchers realize that the September 11th attacks not only affected individuals located in New York, as the literature review shows, but also individuals all around the country, especially college students. Although the effects were not significant for college adjustment and September 11th exposure, effects may be found with a larger number of participants. Effects were found with direct and indirect exposure to the terrorist attacks and loss of psychosocial resources and PTSD symptoms. As expected, those with more exposure experienced higher levels of PTSD symptoms and higher levels of fear, distrust, and need for support, as measured by the psychosocial resources questionnaire. This is especially interesting in this study since the individuals were not only far removed from the events, but they also reported higher levels of PTSD symptoms related to the attacks 14 months after the attacks occurred.

Further research may reveal problems with college adjustment, especially for those who experienced the attacks as incoming freshmen. It was hypothesized that students who were college freshmen at the time of the attacks would experience poor college adjustment because of the added stress of the attacks. However, our sample did not contain enough sophomores (who were freshmen at the time of the attacks) to measure this. Research over the next few years should reveal the effects of the attacks over time, on people directly affected by and far removed from the events. It would also be interesting to see how foreign students were affected by the terrorist attacks, since two students reported fearing for their safety because of their ethnicity.

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