

TRAUMATIC EVENTS, DRUG USE, AND SYMPTOMS OF
POST TRAUMATIC STRESS DISORDER IN COLLEGE STUDENTS

A Senior Thesis

By

Jennifer Bailey

1996-97 University Undergraduate Research Fellow

Texas A&M University

Group: PSYCHOLOGY I

Traumatic Events, Drug Use, and Symptoms of Post Traumatic Stress
Disorder in College Students

Jennifer Bailey
University Undergraduate Fellow, 1996-1997
Texas A&M University
Department of Psychology

APPROVED

Fellows Advisor

Emily S. Davidson

Honors Director

Resurrection

TRAUMATIC EVENTS, DRUG USE, AND SYMPTOMS OF POST TRAUMATIC STRESS DISORDER IN COLLEGE STUDENTS. Jennifer E. Bailey (Emily S. Davidson), Psychology, Texas A&M University.

425 undergraduates completed a PTSD self-report scale, the Trauma Symptom Inventory, the Lifetime Involvement in Violent Events Survey, and a substance abuse questionnaire. They were also asked if they had experienced a trauma, and if not, what was the worst thing that had ever happened to them. Violent trauma was the best predictor of symptoms of PTSD, marijuana use, frequency and amount of alcohol use. Gender effects were also obtained: women reported higher levels of symptoms while men reported higher levels of drug use.

Post Traumatic Stress Disorder, or PTSD, is "among the most extreme reactions that individuals can have to high magnitude life events and can result in severe and chronic impairments across the major life areas" (Brown & Wolfe, 1994). At diagnosable levels, the syndrome is characterized by re-experiencing the traumatic events, hyperarousal, and avoidance symptoms. Sub-clinical levels of these symptoms are also measured as evidence of the effects of stressful events.

The earliest research on PTSD focused on veterans of combat. These men had experienced both indirect and direct trauma for extended periods of time. The same type of exposure is not usually found in non-combat situations, and the first studies of civilian PTSD considered the psychological sequelae to natural disasters, such as the Armenian earthquake of 1988 in which between twenty-five and one hundred thousand people were killed. This is also a multi-dimensional trauma, for not only had the people endured an earthquake, experienced or observed physical trauma, and lost loved ones, they were also required to face the destruction of their homes and businesses. In Goenjian's (1993) study of the reaction of mental health professionals to the disaster, he found that levels of PTSD in help seeking populations ranged between fifty and ninety-five per cent, while in a randomly drawn sample of adolescents who had not sought help, there was a rate of fifty-six per cent with diagnosable PTSD a year after the disaster. Even for natural disasters, the situation in Armenia was extreme; two years after the quake, the

majority of the population was still living in temporary housing.

Research in the United States on PTSD following natural disasters includes the study by Pickens, Field, Prodromidis, Pelaez-Nogueras, et al. (1995) of college students after Hurricane Andrew. Through the use of self-report questionnaires they asked two hundred twenty psychology students about both hurricane and non-hurricane stressors and their reactions to them. They found that " many students reported posttraumatic symptoms, including intrusive thoughts about the hurricane, sleep disturbances, somatic complaints, memory and attention deficits, and symptoms of anxiety and depression." Students were more likely to experience these symptoms if they had also experienced property damage or fear of personal injury as a result of the hurricane.

Studies of single events exposure have also considered traumas perpetrated by humans. DSMIV (APA, 1994) suggests that PTSD "may be especially severe and longer-lasting if the stressor is of human design." In their consideration of a sniper attack at an elementary school, Nader, Pynoos, Fairbanks, and Frederick (1990) performed a fourteen-month follow-up of children who attended the school where a man had killed one child and injured thirteen others and an adult. The researchers investigated the levels of symptoms including intrusive imagery and thought, detachment, guilt feelings, difficulty concentrating, and avoidance of reminders by way of structured interviews and drawing and storytelling exercises in one hundred children. Over

the fourteen month period, the children's symptoms had decreased, yet the authors point out that "symptoms of PTSD may affect a number of factors in the developmental process, including cognition, attention, initiative, social interaction, outlook, personality style, self-esteem, and impulse control."

A study of the Luby's shooting in Killeen by North, Smith, and Spitznagel (1994) considered the different reactions of witnesses based on the amount of lifethreat they had incurred. They interviewed one hundred thirty-six people who had been involved in some way with the cafeteria that day. Their categories included those who had been injured, those who had been eyewitnesses, and those who had been on site but not in the room with the gunman. They point out that even though this was a combat-like situation, the civilians involved were neither trained for combat nor were they expecting such a scenario to unfold during their lunch hour. Their study showed that "Virtually every subject, even those without PTSD, reported having experienced some posttraumatic symptoms." It is also interesting to note that those eyewitnesses that were unharmed were more likely to develop PTSD than those who were injured.

Most recently, studies have begun to consider the prevalence of PTSD in the society at large. This research tends to focus on the effects of interpersonal violence. Interpersonal violence has been defined by Weaver and Clum (1995) as "intentional, directly experienced, noncombat violence perpetrated by another human being." The question of the impact of interpersonal

violence has only recently come under scrutiny in the past twenty-five years. During the 1970s, victimized groups were being identified, and support services were developed, and in the 1980s empirical research was begun on the psychological distress caused by these events. This research has shown that "experiences of interpersonal violence can have far-reaching consequences for the mental health and quality of life of the individuals who are victimized" (Weaver & Clum, 1995). DSMIV also includes witnessing or hearing about such an event as a potential trauma as well. Even though trauma has been defined by the psychological community as an event outside the range of usual human experience, recent community studies have shown that traumatic events are not as uncommon as one might believe.

Research conducted at Texas A&M by McGruder, Davidson, Stock, Finch, and Gleaves (1996) found that forty-five per cent of the undergraduates in their study had experienced at least one episode of direct interpersonal violence. Although few students in their study had diagnosable levels of PTSD, many exhibited subclinical levels of distress.

A study of young adults in Detroit by Breslau, David, Andreski, and Peterson (1991) found that thirty-nine per cent of the twenty-one to thirty year olds they surveyed had experienced at least one event which would qualify as a stressor that could lead to PTSD. In the Detroit study, a random sample of one thousand was drawn from a health maintenance organization. Of the thirty-nine per cent who had been exposed to a traumatic

event, twenty-four per cent (23.6) had developed PTSD, for a general population prevalence of nine per cent (9.2). They found that, although men were more likely to have been exposed to a traumatic event, women were more likely to develop PTSD afterwards. The authors point out that "the lifetime prevalence of PTSD in this sample - 9.2% - places this diagnosis among the most common psychiatric disorders of young adults, surpassed only by phobia, major depression, and alcohol and drug dependence."

Using the St. Louis National Institute of Mental Health Epidemiological Catchment Area project, Cottler, Compton, Mager, Spitznagel, and Janca (1992) found the prevalence of PTSD in a community sample to be 1.35%. A sample of 2,663 subjects were interviewed using the Diagnostic Interview Schedule. This study is also interesting because it further develops the premise of the current research. The St. Louis study also considered the relationship between drug use and PTSD, but from the direction of drug use predicting PTSD. That a relationship between PTSD and drug use exists has been shown in research using veterans of the Vietnam War. These veterans have been found to use alcohol and other drugs as a form of self-medication to control posttraumatic symptoms as well as to recall suppressed memories. McFall, Mackay, and Donovan (1992), in a study of substance abusing veterans presenting for treatment at a VA hospital, found that although there was no difference between veterans who had seen combat and those who had not, combat-exposed veterans with PTSD did have more severe drug dependencies than combat-exposed

veterans without PTSD. "PTSD symptomology was more predictive of drug and alcohol abuse than was level of combat experience."

In the St. Louis study of substance abusers in the general population (Cotler et al., 1992), the researchers suggest that "psychoactive substances may increase the risk of exposure to events outside that range of normal experience, which may in turn increase the risk for experiencing symptoms of PTSD." The results suggest that the use of addictive drugs increased both the potential for experiencing a traumatic event as well as vulnerability to PTSD. Brown and Wolfe (1994) point out that the wide range of effects received by substance abusers quite possibly indicates a more complex relationship between substance abuse and PTSD, as evidence has been found to support both models. Further research into this relationship is necessary because "the frequent co-occurrence of PTSD and substance abuse is consistent with the hypothesis that trauma and its psychological sequelae have etiological significance in the development and/or maintenance of substance abuse" (McFall, Mackay, & Donovan, 1992).

A study was recently completed at Texas A&M by Brondy and Davidson (1996) regarding drug use by undergraduates. Eighty-five per cent (85.8%) of their sample had experience with alcohol in the past six months, with over forty per cent (43.1%) consuming four or more drinks per sitting, and twenty per cent (22.9%) consuming six or more drinks per sitting. In a similar study conducted at the University of Texas, Clifford, Edmundson,

Koch, and Dodd (1989) found that eighty per cent (81.7%) of their sample had consumed alcohol within the past thirty days, with thirty-five per cent (35.4%) consuming six or more drinks per sitting. Their study also showed that twenty per cent (22.4%) had used marijuana in the last thirty days. This amount of consumption is such that these undergraduates may already be abusing alcohol, which puts them at risk for becoming alcohol dependent if they are not so already.

These studies have shown that interpersonal violence and the symptoms of PTSD associated with it are a problem affecting the general population, including young adults and college students. Research has also shown that substance abuse is related to PTSD, although the nature of this relationship is not entirely clear. No research had been done on a general population of college students to consider the level of interpersonal violence they have incurred, the current level of symptoms of PTSD they might be experiencing, and the relationship of these two variables to drug use. The purpose of the current study was to determine whether a relationship might exist between the forty-five per cent of undergraduates who have experienced an episode of interpersonal violence, and the forty per cent of undergraduates who are consuming four or more alcoholic drinks per sitting.

Due to the different results produced by violent traumas and direct traumas as opposed to trauma in general, each of these was considered separately. In addition, traumas which were both direct and violent were also analyzed.

Method

Sample

The sample of 426 college students was drawn from the psychology research pool at Texas A&M. This pool is composed of students taking Psychology 107 who are required to participate in four hours of research to receive credit for the class. The questionnaire took about thirty minutes to complete, and was grouped with questionnaires for several other studies to complete the hour credit the students needed.

Of the 426 students surveyed, the mean age was 18.6 years. The sample was 54.7% female, and 64.7% first year college students. The ethnicity of the sample was 4.3% black, 69.9% white, 10.9% hispanic, and 15% from other ethnic backgrounds. 68.7% of the sample had parental income above \$50,000 per year while 11.6% had parental income at or below \$30,000 per year. The sample's homogeneity may be partly responsible for the lack of significant effects for demographic variables. Demographic characteristics of the sample are presented in Table 1.

Measures

The questionnaire consisted of 208 questions, and was a combination of four measures:

Demographics Questionnaire The following background information was collected: current age, gender, classification, ethnicity, urban or rural hometown residence, participant's marital status, parental income, and parent marital status.

Post Traumatic Stress Disorder Self Report A seventeen-item

measure designed to assess the symptoms of PTSD. Subjects were asked to rate how often certain experiences had happened to them during the past six months on a scale from 0 (never) to 3 (often).

The Trauma Symptom Inventory (TSI) (Briere, 1992). The TSI is a 100-item self-report measure designed to assess psychological symptoms in people who experienced traumatic events during childhood and adulthood. The TSI yields nine subscale scores and a total symptom score (the sum of the subscales). The subscales are as follows: Anxious Arousal, Depression, Anger/Irritability, Sexual Concerns, Dysfunctional Sexual Behavior, Intrusive Experiences, Defensive Avoidance, and Impaired Self-Reference.

The TSI has good internal consistency and has demonstrated adequate convergent and divergent validity. It is uncorrelated with non-personal experiences, and although the subscales are sensitive to PTSD, they also reflect a variety of general distress (e.g. depression) which are not specific to PTSD.

Lifetime Involvement in Violent Events Survey (LIVES) (McGruder, Stock, & Davidson, 1995). The Lifethreat scale from the LIVES was given. These thirty-nine questions were used to assess frequency of specific traumas as well as mode of victimization on a Likert scale. Lifethreat events (LIF) include the following: held hostage, stabbed with a knife, mugged, chased by a gang, beaten, attempted rape, complete rape, forced sexplay, forced sex acts, and carjacking. The answers were also used to

develop ratings of direct, witnessed, and told about lifethreat.

Substance Abuse Questionnaire Information was also collected regarding lifetime use and use in the past six months of marijuana, cocaine, opiates, tranquilizers, and other drugs. Subjects were asked to respond by selecting the frequency of use of each drug for the past six months as well as lifetime use. Choices ranged from "Not at all" to "Forty or more times". Subjects were also asked to estimate frequency of use of alcohol, caffeine, and tobacco in the last six months, and how much was consumed in a single setting. (Lifetime use was not requested because the percentage of subjects who have never used these drugs, especially alcohol, is extremely low). Substance use is reported in Table 2.

Open-Ended Question In addition, subjects were asked "Have you ever experienced a trauma?" Subjects who answered yes were asked to write down their traumatic experience. Those who had not experienced a trauma were asked to make a written response to the question "What was the most horrible or frightening thing that you have experienced?". Written responses were then coded according to the DSMIV definition of trauma, as well as the directness and violence of the event. Rating was done independently by two coders who conferenced on all disagreements to reach a final rating which was used for all analyses. Initial interrater reliability (per cent agreement) was .89.

Procedure

This investigation was approved by the Institutional Review

Board for Human Subjects. The students read and signed a consent form informing them of the nature of the study, that they could discontinue the study at any time, and that responses would be anonymous. Participation in this investigation was voluntary. Students were informed that they could discontinue the study at any time and still receive the credit.

Data Analyses

Preliminary Analyses Analyses of parent's marital status, size of hometown, and ethnicity were all insignificant. A comparison of freshman and all other classifications did reveal a significant effect on depression and sexual confusion, such that freshman were more likely to have experienced depression and less likely to have experienced sexual confusion. These were the only significant effects and did not appear to form a pattern, therefore they will not be considered further.

Internal Consistency. Coefficient alphas were calculated for the three subscales of the PTSD self report and the nine subscales of the TSI. As shown in Table 3, the outcome measures were internally consistent. Internal consistency for the events scales was not determined.

Exposure Data Incidence of traumatic events was quite high in this sample based on responses to the open-ended questions, with 76.2% of the sample having experienced an event which was traumatic according to DSMIV. Out of the sample as a whole, 36.6% had experienced a direct trauma, 25.1% had experienced a violent trauma, and 14.1% had experienced a trauma which was both

direct and violent. Prevalence of exposure to lifethreat events on the LIVES is presented in Table 4.

Gender and Trauma Differences The first analyses considered any event that was coded as a trauma to determine whether a relationship existed with trauma in general as well as the possibility of an interaction between trauma and gender. For these purposes a 2 (gender) X 2 (trauma) MANOVA was conducted with symptoms on the PTSD Self-Report and the TSI and drug use as the dependent variables.

Results indicated a significant main effect for trauma, Wilk's Lambda $F(16,385)=1.80$, $p<.03$. Univariate analyses of the exposure variables revealed significant differences in the TSI Scale of intrusive thoughts [$F(1,400)=3.79$, $p<.05$] as well as in consumption of alcohol per setting [$F(1,400)=4.12$, $p<.04$], consumption of alcohol in the last six months [$F(1,400)=4.90$, $p<.03$], lifetime marijuana use [$F(1,400)=5.39$, $p<.02$] and marijuana use in the past six months [$F(1,400)=5.01$, $p<.03$].

Examination of the means revealed that those who had experienced a trauma were more likely to have consumed more alcohol per setting, to drink alcohol more often, and to have higher lifetime and past six months marijuana use.

Results also indicated a significant main effect for gender, Wilk's Lambda $F(16,385)=3.73$, $p<.001$. Univariate analyses of the exposure variables revealed significant differences in the TSI Scales of depression [$F(1,400)=20.62$, $p<.001$], anxious arousal [$F(19,382)=19.65$, $p<.001$], dissociation [$F(1,400)=7.17$, $p<.008$],

sexual concerns [$F(1,400)=4.61, p<.03$], intrusive thoughts [$F(1,400)=12.90, p<.001$], defensive avoidance [$F(1,400)=12.18, p<.001$], and impaired self reference [$F(1,400)=10.83, p<.001$], as well as in reexperiencing [$F(1,400)=17.35, p<.001$], hyperarousal [$F(1,400)=7.70, p<.006$], and avoidance [$F(1,400)=5.84, p<.02$], with marginal effects for alcohol consumed per setting [$F(1,400)=3.32, p<.07$] and lifetime marijuana use [$F(19,382)=3.34, p<.07$].

Examination of the means revealed that women are more likely to have experienced symptoms of anxious arousal, depression, dissociation, intrusive thoughts, defensive avoidance, impaired self reference, reexperiencing, hyperarousal, and avoidance. Men are more likely to have experienced sexual concerns. Gender was included in all subsequent analyses. Results varied slightly as a result of missing data. The means from the comparison of direct violent trauma and gender are presented in Table 5.

A marginally significant overall interaction was also noted, Wilk's Lambda $F(16,385)=1.52, p<.09$. Post-hoc analysis (Newman Keuls) revealed that women who experienced a trauma were higher on reexperiencing than women who had not experienced a trauma and men in general.

Gender and Direct Trauma Differences. Events coded as traumatic as well as direct were considered next to separate the effects of directly experienced events as opposed to those events, which while traumatic, were witnessed or verbally mediated. For these purposes a 2 (gender) X 2 (direct trauma) MANOVA was conducted

with exposure variables on the LIVES, symptoms on the PTSD Self-Report and the TSI, and drug use as the dependent variables.

Results indicated a significant main effect for direct trauma, Wilk's Lambda $F(16,398)=1.98$, $p<.03$. Univariate analyses revealed significant differences in hyperarousal [$F(1,413)=5.22$, $p<.02$] and avoidance [$F(1,413)=3.71$, $p<.05$].

Examination of the means showed those who had experienced a direct trauma to be more likely to experience hyperarousal. Means are presented in Table 7.

Results also indicated a significant main effect for gender, Wilk's Lambda $F(16,398)=5.63$, $p<.001$. Univariate analyses revealed significant differences in the TSI Scales of anxious arousal [$F(1,413)=23.83$, $p<.001$], depression [$F(1,413)=20.70$, $p<.001$], dissociation [$F(1,413)=7.76$, $p<.006$], sexual concerns [$F(1,413)=4.56$, $p<.03$], intrusive thoughts [$F(1,413)=14.04$, $p<.001$], defensive avoidance [$F(1,413)=13.31$, $p<.001$], and impaired self reference [$F(1,413)=11.21$, $p<.001$] as well as in reexperiencing [$F(1,413)=19.89$, $p<.001$], hyperarousal [$F(1,413)=8.41$, $p<.004$], avoidance [$F(1,413)=6.49$, $p<.01$], alcohol use per setting [$F(1,413)=4.05$, $p<.04$], and a marginal effect for lifetime marijuana use [$F(1,413)=3.68$, $p<.06$].

Examination of the means revealed that women were more likely to have experienced depression, dissociation, intrusive thoughts, impaired self reference, reexperiencing, hyperarousal, and avoidance, while men were more likely to have experienced sexual concerns and to have consumed more alcohol per setting.

The interaction between direct trauma and gender was not significant.

Gender and Violent Trauma Differences As the previous research has shown differences in the effects of violent events as compared to nonviolent events, the next analyses considered events coded as both traumatic and violent in a 2 (violent trauma) X 2 (gender) MANOVA with symptoms on the PTSD Self-Report and the TSI, and drug use as the dependent variables.

Results indicated a significant main effect for violent trauma, Wilk's Lambda $F(16,398)=2.02$, $p<.01$. Univariate analyses showed significant differences for the TSI scales of anxious arousal [$F(1,413)=3.89$, $p<.05$], depression [$F(1,413)=8.70$, $p<.003$], anger [$F(1,413)=8.91$, $p<.003$], sexual dysfunction [$F(1,413)=8.34$, $p<.004$], intrusive thoughts [$F(1,413)=4.87$, $p<.03$], defensive avoidance [$F(1,413)=3.87$, $p<.05$], as well as for reexperiencing [$F(1,413)=5.27$, $p<.02$], hyperarousal [$F(1,413)=9.93$, $p<.002$], avoidance [$F(1,413)=8.12$, $p<.005$], frequency of alcohol consumption [$F(1,413)=6.08$, $p<.01$], alcohol consumption per setting [$F(1,413)=5.45$, $p<.02$], marijuana use in the past six months [$F(1,413)=12.25$, $p<.001$], and lifetime marijuana use [$F(1,413)=11.90$, $p<.001$].

Examination of the means revealed subjects who had experience with violent trauma were more likely to experience anxious arousal, depression, anger, dissociation, sexual dysfunction, intrusive thoughts, defensive avoidance, reexperiencing, hyperarousal, avoidance, to have used alcohol

more frequently, to have used more alcohol per setting, to have used more marijuana in the last six months, and to have a higher lifetime use of marijuana. Means are presented in Table 8.

Results also indicated a significant main effect for gender, Wilk's Lambda $F(16, 398)=5.05, p<.001$. Univariate analyses revealed significant differences in the TSI scales of anxious arousal [$F(1,413)=23.34, p<.001$], depression [$F(1,413)=20.25, p<.001$], dissociation [$F(1,413)=7.04, p<.008$], sexual concerns [$F(1,413)=4.21, p<.04$], intrusive thoughts [$F(1,413)=13.72, p<.001$], defensive avoidance [$F(1,413)=12.55, p<.001$], impaired self-reference [$F(1,413)=10.43, p<.001$], as well as reexperiencing [$F(1,413)=19.26, p<.001$], hyperarousal [$F(1,413)=8.88, p<.003$], avoidance [$F(1,413)=6.78, p<.01$], alcohol use per setting [$F(1,413)=4.49, p<.03$], and lifetime use of marijuana [$F(1,413)=3.83, p<.05$].

Examination of the means revealed that women were more likely than men to have experienced anxious arousal, depression, dissociation, intrusive thoughts, defensive avoidance, impaired self-reference, reexperiencing, hyperarousal and avoidance while men were more likely to have experienced sexual concerns.

The interaction between violent trauma and gender was not significant.

Gender and Direct Violent Trauma Differences DSMIVs suggest that events of interpersonal violence may have longer lasting effects on victims than other types of trauma. In this study, interpersonal violence would fall into the categories of both

direct and violent trauma. Because the analyses of both of those types of trauma revealed significant relationships, further analysis was done to consider the significance of traumas which were both direct and violent. A 2 (gender) X 2 (direct violent trauma) MANOVA was conducted with symptoms on the PTSD Self-Report and the TSI, and drug use as the dependent variables.

Results indicated a significant main effect for direct violent trauma, Wilk's Lambda $F(16,398)=2.45$, $p<.002$. Univariate analyses of the symptom variables revealed significant differences in the TSI scales of anxious arousal [$F(1, 413)=5.11$, $p<.02$], depression [$F(1,413)=12.03$, $p<.001$], intrusive thoughts [$F(1,413)=9.41$, $p<.002$], and defensive avoidance [$F(1,413)=3.99$, $p<.05$] as well as in reexperiencing [$F(1,413)=10.76$, $p<.001$], hyperarousal [$F(1,413)=20.44$, $p<.001$], avoidance [$F(1, 413)=19.29$, $p<.001$], and frequency of alcohol consumption [$F(16, 398)=5.30$, $p<.02$], with marginal effects for the TSI scales of anger [$F(1,413)=2.81$, $p<.09$] and sexual concerns [$F(1,413)=3.14$, $p<.08$].

Examination of the means revealed that subjects who had a experienced a direct violent trauma were more likely to have experienced anxious arousal, depression, intrusive thoughts, defensive avoidance, reexperiencing, hyperarousal, avoidance, and to have consumed alcohol more frequently. Means are presented in Table 9.

Results indicated a significant main effect for gender, Wilk's Lambda $(16, 398)=3.81$, $p<.001$. Univariate analyses

revealed significant differences in the TSI scales of anxious arousal [$F(1,413)=22.03, p<.001$], depression [$F(1,413)=18.14, p<.001$], dissociation [$F(1,413)=6.61, p<.01$], sexual concerns [$F(1,413)=4.83, p<.03$], intrusive thoughts [$F(1,413)=12.29, p<.001$], defensive avoidance [$F(1,413)=11.73, p<.001$], and impaired self reference [$F(1,413)=10.24, p<.002$], as well as for reexperiencing [$F(1,413)=17.72, p<.001$], hyperarousal [$F(1,413)=7.17, p<.008$], avoidance [$F(1,413)=5.28, p<.02$], alcohol consumed per setting [$F(1,413)=4.81, p<.03$] and a marginal effect for lifetime marijuana use [$F(1,413)=3.66, p<.06$].

Examination of the means revealed that women were more likely to experience anxious arousal, depression, dissociation, intrusive thoughts, defensive avoidance, impaired self-reference, reexperiencing, hyperarousal, and avoidance, while men were more likely to have sexual concerns and to consume more alcohol per setting.

The interaction between direct violent trauma and gender was not significant.

Diagnosable PTSD.

The PTSD Self Report was scored using 3 (Sometimes) and above to indicate presence of a symptom (Lenient criterion); presence of symptoms was then used to determine whether subjects met each criterion for PTSD. Diagnoses were recalculated using 4 (Commonly) and above (stringent criterion).

Type of Trauma and Diagnosable PTSD Due to the differing

relationship between specific types of trauma and symptoms of PTSD, the possible relationships between type of trauma experienced and diagnosable PTSD was considered. Chi-Square analyses were done to compare specific types of trauma with lifetime and current diagnoses of PTSD using both the lenient and the stringent criterion. Subjects who experienced a direct trauma are more likely to have a lenient lifetime diagnosis, $\chi^2(1, N=426)=3.94, p<.05$. Subjects who had experienced a trauma that was both direct and violent had a more significant relationship with a lenient lifetime diagnosis of PTSD, $\chi^2(1, N=426)=14.65, p<.001$. Using the more stringent diagnosis, trauma that was both direct and violent had a relationship with lifetime diagnosis with PTSD, $\chi^2(1, N=426)=3.96, p<.05$. None of the analyses revealed a significant relationship with stringent or lenient current diagnosis of PTSD. However, only 29 (6.81%) had a stringent diagnosis of current PTSD, and only 52 (12.21%) had lenient current diagnosis of PTSD.

Current Diagnosis and Drug Use Analyses showed that different types of trauma are related to varying levels of symptoms and drug use. The next consideration was whether diagnosable PTSD related to specific types of trauma would significantly effect different levels of alcohol and marijuana consumption. Current diagnosis of PTSD and type of trauma experienced were compared with drug use in several MANOVAs.

Using the lenient PTSD criterion, a significant relationship was found between subjects with currently diagnosable PTSD who

had experienced any trauma and marijuana and alcohol use, Wilk's Lambda $F(4,418)=4.41$, $p<.002$. Univariate analyses revealed significant differences in alcohol consumption per setting [$F(4,418)=3.86$, $p<.05$] and lifetime marijuana use [$F(4,418)=12.29$, $p<.001$]. A marginally significant difference for marijuana use in the last six months [$F(4,418)=2.92$, $p<.09$] was also observed. Means are presented in Table 10.

Using the stringent criterion for PTSD diagnosis, a significant relationship between subjects with currently diagnosable PTSD who has experienced any trauma and marijuana and alcohol use was found, Wilk's Lambda $F(4,418)=6.04$, $p<.001$. Univariate analyses revealed significant differences in lifetime marijuana use [$F(4,418)=19.80$, $p<.001$] and marijuana use in the last six months [$F(4,418)=5.29$, $p<.02$]. The analysis also showed a marginally significant effect on alcohol consumption per setting [$F(4,418)=3.63$, $p<.06$]. Means are presented in Table 11.

Analyses using both the stringent and lenient criterion for PTSD diagnosis revealed no significant relationships between subjects with PTSD who had experienced only direct trauma, only violent trauma, or only direct and violent trauma and marijuana and alcohol consumption.

Lifetime Diagnosis and Drug Use Lifetime diagnosis and type of trauma were compared to alcohol and marijuana consumption using MANOVAS.

Using the lenient criterion, a significant relationship was revealed between subjects with lifetime diagnosable PTSD who had

experienced violent trauma and alcohol and marijuana use, Wilk's Lambda $F(4,418)=2.10$, $p<.08$. Means are presented in Table 12.

When the stringent criterion for PTSD diagnosis was used, a significant relationship between subjects with lifetime diagnosable PTSD who had experienced any trauma and alcohol and marijuana consumption, Wilk's Lambda $F(4,418)=4.17$, $p<.003$. Univariate analyses revealed a significant effect on lifetime marijuana use [$F(4,418)=12.77$, $p<.001$]. Examination of the means showed that subjects with lifetime diagnosable PTSD who had experienced any trauma were more likely to have used marijuana. Means are presented in Table 13.

Using the stringent criterion, a significant relationship was found between subjects with lifetime diagnosable PTSD who had experienced a direct trauma and alcohol and marijuana use, Wilk's Lambda $F(4,418)=2.95$, $p<.02$. Univariate analyses revealed a significant effect on lifetime marijuana use [$F(4,418)=7.66$, $p<.006$]. Examination of the means showed that subjects with lifetime diagnosable PTSD who had experienced a direct trauma were more likely to have used marijuana.

Using the stringent criterion, a significant relationship was found between subjects with lifetime diagnosable PTSD who had experienced a violent trauma and alcohol and marijuana use, Wilk's Lambda $F(4,418)=5.80$, $p<.001$. Univariate analyses revealed a significant effect on alcohol consumption per setting [$F(4,418)=4.06$, $p<.04$] and lifetime marijuana use [$F(4,418)=11.11$, $p<.001$]. Examination of the means showed that

subjects with lifetime diagnosable PTSD who had experienced a violent trauma were more likely to consume more alcohol per setting and to have used marijuana.

Using the stringent criterion, a significant relationship was found between subjects with lifetime diagnosable PTSD who had experienced a direct violent trauma and alcohol and marijuana use, Wilk's Lambda $F(4,418)=4.02$, $p<.003$. Univariate analyses revealed a significant effect on lifetime marijuana use [$F(4,418)=9.06$, $p<.003$]. Examination of the means showed that subjects with lifetime diagnosable PTSD who had experienced a direct violent trauma were more likely to have used marijuana.

Discussion

Gender differences were seen throughout the analyses; results varied slightly due to differing missing data so the following results are based on the analysis of direct violent trauma. Women were more likely to have experienced anxious arousal, depression, intrusive thoughts, defensive avoidance, impaired self reference, reexperiencing, hyperarousal, and avoidance, while men were more likely to have sexual concerns and to consume more alcohol.

The results have shown that trauma is related to symptoms of PTSD. Trauma in general was related to increased alcohol and marijuana use. It was surprising that when traumas that the subject either witnessed or was told about were excluded, direct trauma was significantly related to hyperarousal alone. This

supports the theory that non-direct traumas do have an effect.

Another unexpected finding was that violent trauma, without regard to the mode of victimization, had a stronger effect than did direct trauma. All symptom scales were increased in those who reported violent trauma, with 75% increasing at significant levels as well as marijuana and alcohol use. Direct violent trauma was also related to increased symptom scores and drug use, although fewer scales had significant differences. This may be attributable to loss of power as comparison samples decreased in size.

Current diagnosis of PTSD could not be predicted by type of trauma experienced. Lenient lifetime diagnosis could be predicted by direct and direct violent trauma, while only direct violent trauma had a significant relationship with stringent lifetime diagnosis. When a significant effect was found, PTSD diagnosis was related to increased lifetime marijuana use.

Except in the case of lenient current diagnosis with violent trauma, subjects with a PTSD diagnosis were always higher on the measures of alcohol and marijuana use, albeit insignificantly. Significant relationships with increased lifetime marijuana use were found for all types of stringent lifetime diagnoses. The lack of significance in other comparisons may be due to low power. As more distinctions were made about types of trauma and current or lifetime diagnosis of PTSD, power greatly decreased. This loss of power may have resulted in the loss of significant relationships which exist between mode of victimization and

symptoms of PTSD or drug use.

This study has demonstrated the viability of college students as a population for study of the effects of traumatic events. Although the majority of students in this sample would be considered to come from privileged homes, the subjects were not protected from experiencing traumatic events or their sequelae.

The results have also shown that using more stringent criteria for PTSD diagnosis results in greater predictability of problems with drug use.

Whether trauma leads one to use drugs or the use of drugs increases the opportunity for trauma is still unclear. Obviously a correlational study cannot determine direction of causality. The results of this study can be interpreted to support either viewpoint. Of the 302 subjects had experienced an event coded as traumatic, 138 (45.7%) had experienced the trauma before the age of 16. This would tend to suggest that the trauma occurred before drug use began. At the same time, the trauma occurred after the age of 16 for 164 subjects (54.3%) which lends itself to the interpretation that drug use may have started before the trauma. More information regarding age at the beginning of drug use is necessary to further clarify this relationship.

References

- American Psychiatric Association. (1994). Diagnostic and Statistical Manual, Fourth Edition.
- Breslau, N., Davis, G., & Peterson, E. (1991). Traumatic events and posttraumatic stress disorder in an urban population of young adults. Archives of General Psychiatry, 48, 216-222.
- Briere, J., Cotman, A., Harris, K., Smiljanich, K. (1992). The Trauma Symptom Inventory: Preliminary Psychometric and Standardization Data. Paper presented at the Eighth Annual Meeting of the International Society for Traumatic Stress, Los Angeles, California.
- Brondy, T., & Davidson, E.S. (1996). Attention deficit/hyperactivity disorder and substance abuse in a college population. Manuscript in preparation.
- Brown, P., & Wolfe, J. (1994). Substance abuse and post-traumatic stress disorder comorbidity. Drug and Alcohol Dependence, 35, 51-59.
- Clifford, P., Edmundson, E., Koch, W., & Dodd, B. (1989). Discerning the epidemiology of drug use among a sample of college students. Journal of Drug Education, 19, 209-223.
- Cottler, L., Compton, W., Mager, D., Spitznagel, E., & Janca, A. (1992). Posttraumatic stress disorders among substance users from the general population. American Journal of Psychiatry, 149, 664-670.
- Goenjian, A. (1993). A mental health programme in Armenia after the 1988 earthquake. British Journal of Psychiatry, 163,

230-239.

McFall, M., Mackay, P., & Donovan, D. (1992). Severity of substance abuse in Vietnam veterans. Journal of Studies on Alcohol, 53, 357-363.

McGruder, A., Stock, W., & Davidson, E.S. (1995, November). The Lifetime Involvement in Violent Events Survey. Poster session presented at the annual meeting of The Association for the Advancement of Behavior Therapy, Washington, D.C.

Nader, K., Pynoos, R., Fairbanks, L., & Frederick, C. (1990). Children's PTSD reactions one year after a sniper attack on their school. American Journal of Psychiatry, 147, 1526-1530.

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

North, C., Smith, E., and Spitznagel, E. (1994). Posttraumatic stress disorder in the survivors of a mass shooting. American Journal of Psychiatry, 151, 82-88.

Pickens, J., Field, T., Prodromidis, M., Pelaez-Nogueras, M., et al. (1995). Posttraumatic stress, depression, and social support among college students after Hurricane Andrew. Journal of College Student Development, 36, 152-161.

Weaver, T., & Clum, G. (1995). Psychological distress associated with interpersonal violence: A meta-analysis. Clinical Psychology Review, 15, 115-140.

Table 1

Demographic Variables

Variable	%	N
Gender		
Male	45.3	193
Female	54.7	233
Ethnicity		
African-American	4.3	18
Anglo-American	69.9	295
Mexican-American	10.9	46
Asian-American	5.0	21
Native American	2.4	10
Other	7.6	32
Age		
16	.3	1
17	1.8	7
18	58.9	234
19	24.7	98
22	8.1	32
27	.8	3
Classification		
Freshman	64.7	275
Sophomore	24.5	104
Junior	6.8	29
Senior	4.0	17

Table 1 Continued

Marital Status

Single	98.3	417
Married	.7	3
Other	.9	4

Parent Marital

Single	1.9	8
Married	79.7	337
Divorced	15.6	66
Other	2.8	12

Parent Income

Below 5,000	.2	1
6-10,000	1.0	4
11-15,000	1.9	8
16-20,000	1.7	7
21-30,000	6.8	28
31-40,000	9.4	39
41-50,000	10.2	42
51-60,000	14.5	60
Above 60,000	54.2	224

Hometown

Rural	39.1	165
Urban	60.9	257

Table 2

Prevalence of Drug Use

Drug	Subjects Who Had Used the Drug	
	N	%
Marijuana		
Past 6 months	77	18.2
Lifetime	113	26.7
LSD		
Past 6 months	17	4.0
Lifetime	26	6.1
Uppers		
Past 6 months	7	1.6
Lifetime	13	3.1
Downers		
Past 6 months	4	0.9
Lifetime	5	1.2
Tranquilizers		
Past 6 months	7	1.6
Lifetime	8	1.9
Ecstasy		
Past 6 months	12	2.8
Lifetime	20	4.7
Cocaine		
Past 6 months	6	1.3
Lifetime	9	2.1

Table 2 Continued

Crack

Past 6 months	0	0.0
Lifetime	0	0.0

Poppy Derivatives

Past 6 months	2	0.4
Lifetime	4	0.9

Inhalants

Past 6 months	2	0.5
Lifetime	11	2.6

Codeine

Past 6 months	12	2.8
Lifetime	20	4.6

Alcohol

Past 6 months	329	77.6
---------------	-----	------

Caffeine

Past 6 months	412	97.2
---------------	-----	------

Tobacco

Past 6 months	167	39.5
---------------	-----	------

Table 3

Internal Consistency

TSI Scales	Alpha	Mean	SD
Anxious Arousal	.85	1.01	.63
Depression	.90	.88	.61
Anger/Irritability	.92	.96	.71
Dissociations	.87	.83	.58
Sexual Concerns	.88	.54	.56
Dysfunctional Sexual Behavior	.85	.42	.51
Intrusive Thoughts	.91	.75	.66
Defensive Avoidance	.89	.85	.68
Impaired Self Reference	.87	1.03	.65

Table 4

Prevalence of Exposure to Lifethreat

Lifethreat	Direct		Witnessed		Told About	
	N	%	N	%	N	%
Hostage	6	1.4	7	1.6	122	28.8
Threatened with Gun	58	13.7	56	13.3	264	62.4
Shot with Gun	5	1.1	15	3.5	201	47.4
Threatened with Knife	56	13.2	62	14.6	211	49.9
Stabbed with Knife	7	1.6	20	4.8	153	36.3
Mugged	13	3.1	26	6.1	233	55.2
Chased by Gang	74	17.5	40	9.5	219	51.7
Beaten	41	9.7	97	22.9	241	57.1
Carjacked	3	.7	6	1.4	145	34.3
Forced Sexplay	54	12.8	21	5.0	193	45.7
Forced Attempted Sex	22	5.2	5	1.2	150	35.6
Forced Intercourse	16	3.8	1	.2	153	36.3
Forced Sex Acts	5	1.2	3	.7	68	16.2

Table 5

TSI and Drug Use Scores by Trauma

Scale	Trauma	No Trauma
	N=308	N=96
	Mean	Mean
Anxious Arousal	1.03	.94
Depression	.87	.90
Anger	.98	.88
Dissociation	.82	.89
Sexual Concerns	.53	.56
Sexual Dysfunction	.44	.38
Intrusive Thoughts	.78	.64
Defensive Avoidance	.87	.80

Table 5 Continued

Impaired Self Reference	1.02	1.06
Reexperiencing	2.44	2.21
Hyperarousal	2.11	1.90
Avoidance	2.22	2.17
Frequency of Alcohol Use*	2.96	2.39
Alcohol Consumption per Use*	3.03	2.55
Marijuana Use Past 6 Months*	.43	.18
Lifetime Marijuana Use*	.78	.41

Note: * indicates $p < .05$.

Table 6

TSI and Drug Use Scores by Gender

	Men	Women
	N=186	N=231
Scale	Mean	Mean
Anxious Arousal*	.85	1.15
Depression*	.73	1.00
Anger	.94	.97
Dissociation*	.75	.90
Sexual Concerns*	.60	.49
Sexual Dysfunction	.45	.40
Intrusive Thoughts*	.62	.86
Defensive Avoidance*	.73	.97
Impaired Self Reference*	.92	1.13
Reexperiencing*	2.09	2.64
Hyperarousal*	1.87	2.25
Avoidance*	2.05	2.63
Frequency of Alcohol Use	2.87	2.75
Alcohol Consumption per Use*	3.13	2.73
Marijuana Use Past 6 Months	.45	.30
Lifetime Marijuana Use	.82	.57

Note: * indicates $p < .05$.

Table 7

TSI and Drug Use Scores by Direct Trauma

Scale	Direct Trauma	No Direct Trauma
	N=152 Mean	N=265 Mean
Anxious Arousal	1.03	1.01
Depression	.89	.87
Anger	.95	.96
Dissociation	.80	.85
Sexual Concerns	.59	.50
Sexual Dysfunction	.43	.42
Intrusive Thoughts	.78	.74
Defensive Avoidance	.85	.86
Impaired Self Reference	1.01	1.05
Reexperiencing	2.43	2.37
Hyperarousal*	2.27	1.97
Avoidance	2.37	2.14
Frequency of Alcohol Use	2.87	2.77
Alcohol Consumption per Use	2.89	2.92
Marijuana Use Past 6 Months	.39	.35
Lifetime Marijuana Use	.80	.61

Note: * indicates $p < .05$.

Table 8

TSI and Drug Use Scores by Violent Trauma

Scale	Violent Trauma	No Violent
Trauma	N=107	N=310
	Mean	Mean
Anxious Arousal*	1.11	.98
Depression*	1.02	.83
Anger*	1.13	.90
Dissociation	.91	.81
Sexual Concerns	.60	.51
Sexual Dysfunction*	.55	.38
Intrusive Thoughts*	.87	.71
Defensive Avoidance*	.97	.82
Impaired Self Reference	1.10	1.01
Reexperiencing*	2.63	2.31
Hyperarousal*	2.41	1.97
Avoidance*	2.50	2.13
Frequency of Alcohol Use*	3.26	2.65
Alcohol Consumption per Use*	3.30	2.77
Marijuana Use Past 6 Months*	.65	.27
Lifetime Marijuana Use*	1.07	.55

Note: * indicates $p < .05$.

Table 9

TSI and Drug Use Scores by Direct Violent Trauma (D V Trauma)

Scale	D V Trauma	No D V Trauma
	N=60	N=357
	Mean	Mean
Anxious Arousal*	1.18	.99
Depression*	1.12	.84
Anger	1.10	.94
Dissociation	.93	.81
Sexual Concerns	.65	.52
Sexual Dysfunction	.48	.41
Intrusive Thoughts*	.99	.71
Defensive Avoidance*	1.02	.83
Impaired Self Reference	1.10	1.02
Reexperiencing*	2.87	2.31
Hyperarousal*	2.75	1.97
Avoidance*	2.84	2.12
Frequency of Alcohol Use*	3.42	2.70
Alcohol Consumption per Use	3.27	2.85
Marijuana Use Past 6 Months	.42	.36
Lifetime Marijuana Use	.85	.65

Note: * indicates $p < .05$.

Table 10

Lenient Current Diagnosis with Type of Trauma and Mean Drug Use

Type of Trauma Scale	Diagnosed	Not Diagnosed
General	N=27	N=396
Alcohol Frequency	3.26	2.80
Alcohol Consumption	3.67	2.87
Marijuana Past 6 Months	.67	.34
Lifetime Marijuana Use	1.56	.62
Direct	N=14	N=409
Alcohol Frequency	3.29	2.81
Alcohol Consumption	3.50	2.90
Marijuana Past 6 Months	.57	.35
Lifetime Marijuana Use	1.36	.66
Violent	N=11	N=412
Alcohol Frequency	2.55	2.83
Alcohol Consumption	3.54	2.91
Marijuana Past 6 Months	.36	.36
Lifetime Marijuana Use	1.09	.67
Direct Violent	N=8	N=415
Alcohol Frequency	3.13	2.82
Alcohol Consumption	3.50	2.91
Marijuana Past 6 Months	.38	.36
Lifetime Marijuana Use	1.00	.67

Note: * indicates $p < .05$.

Table 11

Stringent Current Diagnosis with Type of Trauma and Mean Drug Use

Type of Trauma Scale	Diagnosed	Not Diagnosed
General	N=22	N=401
Alcohol Frequency	3.59	2.78
Alcohol Consumption	3.73	2.88
Marijuana Past 6 Months*	.82	.34
Lifetime Marijuana Use*	1.91	.61
Direct	N=12	N=411
Alcohol Frequency	3.58	2.80
Alcohol Consumption	3.42	2.91
Marijuana Past 6 Months	.67	.35
Lifetime Marijuana Use	1.58	.65
Violent	N=8	N=415
Alcohol Frequency	3.13	2.82
Alcohol Consumption	3.88	2.90
Marijuana Past 6 Months	.50	.36
Lifetime Marijuana Use	1.50	.66
Direct Violent	N=6	N=417
Alcohol Frequency	3.67	2.81
Alcohol Consumption	3.33	2.92
Marijuana Past 6 Months	.50	.36
Lifetime Marijuana Use	1.33	.67

Note: * indicates $p < .05$.

Table 12

Lenient Lifetime Diagnosis with Type of Trauma and Mean Drug Use

Type of Trauma Scale	Diagnosed	Not Diagnosed
General	N=61	N=362
Alcohol Frequency	3.15	2.78
Alcohol Consumption	3.33	2.85
Marijuana Past 6 Months	.41	.35
Lifetime Marijuana Use	.97	.63
Direct	N=37	N=386
Alcohol Frequency	3.14	2.80
Alcohol Consumption	3.22	2.89
Marijuana Past 6 Months	.41	.36
Lifetime Marijuana Use	1.00	.65
Violent	N=26	N=397
Alcohol Frequency	3.15	2.80
Alcohol Consumption	3.50	2.88
Marijuana Past 6 Months	.36	.35
Lifetime Marijuana Use	1.08	.65
Direct Violent	N=22	N=401
Alcohol Frequency	3.55	2.79
Alcohol Consumption	3.59	2.89
Marijuana Past 6 Months	.38	.36
Lifetime Marijuana Use	1.09	.66

Note: * indicates $p < .05$.

Table 13

Stringent Lifetime Diagnosis with Type of Trauma and Mean Drug Use

Type of Trauma Scale	Diagnosed	Not Diagnosed
General	N=38	N=385
Alcohol Frequency	3.39	2.77
Alcohol Consumption	3.42	2.87
Marijuana Past 6 Months	.61	.34
Lifetime Marijuana Use*	1.42	.61
Direct	N=22	N=401
Alcohol Frequency	3.00	2.82
Alcohol Consumption	3.05	2.92
Marijuana Past 6 Months	.59	.35
Lifetime Marijuana Use*	1.45	.64
Violent	N=14	N=409
Alcohol Frequency	3.36	2.81
Alcohol Consumption*	4.00	2.89
Marijuana Past 6 Months	.57	.35
Lifetime Marijuana Use*	1.86	.64
Direct Violent	N=14	N=409
Alcohol Frequency	3.67	2.80
Alcohol Consumption	3.75	2.90
Marijuana Past 6 Months	.58	.36
Lifetime Marijuana Use*	1.83	.64

Note: * indicates $p < .05$.