POST-TRAUMATIC STRESS DISORDER IN CRIME VICTIMS AND INDUSTRIAL ACCIDENT VICTIMS: A COMPARISON OF SYMPTOMS

by

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Abstract

Workers' Compensation Boards in North America accept a significant number of claims every year for industrial accidents resulting in Post-Traumatic Stress Disorder (PTSD). The majority of research has focused on PTSD in war veterans and sexual assault victims, and to date there is very little research concerning PTSD following industrial accidents. It is not clear whether the symptom presentation in industrial PTSD is the same or different as PTSD experienced by war veterans or crime victims. The following study addressed the question of the psychological effects following industrial accidents for the purpose of better understanding industrial accident PTSD and to investigate possible differences between industrial accident PTSD and crime-related PTSD. Data (N=82) was collected from the files in the Psychology Department of the Workers' Compensation Board of British Columbia where there was a DSM III-R or DSM-IV diagnosis of PTSD following an industrial accident or crime. Results showed that: crime victims experienced a significantly more generalized and pervasive sense of hypervigilance than industrial accident victims. Crime victims also experienced significantly more arousal symptoms (criterion D) than accident victims. The results of this study suggest that the nature of the trauma affects subsequent symptom presentation and manifestation.

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Introduction

It has long been accepted that people can develop adverse psychological reactions after exposure to extreme traumatic situations in which there has been wide-spread destruction and/or serious threat to personal safety. Some of the earliest accounts of anxiety resulting from trauma can be found in the accounts of people who experienced nightmares and "great terror" following the Great Fire of London in the mid-1600s. The idea of workers being compensated for anxiety resulting from accidents first appeared in the 1820's when the boom in rail construction began. Lawsuits could be brought against companies by workers for stress disorders such as "railway brain" or hysteria (Tyndel & Tyndel, 1984). After the turn of the century, the study of war veterans helped to identify psychological symptoms associated with surviving or witnessing traumatic events (Southard, 1919; Grinker & Spiegal, 1945). More recently, the study of U.S. Vietnam veterans has provided research which has allowed for a crystallization of the collection of anxiety-based symptoms present after exposure to trauma. In 1980 the American Psychiatric Association gave this syndrome an official name, Post-Traumatic Stress Disorder, and included it in the DSM III. Further revisions in the criteria and presenting symptoms have

been made and the most recent definition of PTSD can be found in the DSM-IV (American Psychiatric Association, 1994).

Identification Of Problem With Current PTSD Research

Much of the research that has provided the current definition of PTSD and its associated criteria has evolved out of the literature with veterans of war and in particularly, U.S. veterans of the Vietnam War. Almost 40 percent of all research in PTSD from 1970 to 1989 has been with war veterans (Blake, Albano & Keane, 1992). The primary focus of PTSD research concerning symptom presentation and definition therefore has been with the psychological sequele associated with the war experience. A further 29 percent of the research from 1970 to 1989 has focused on sexual abuse, crimes of a sexual nature, and child abuse (Blake et al., 1992). More recently there has been interest in the effects of crime in terms of robbery and physical assault, and the development of PTSD, but to date this research has been limited in terms of specific DSM considerations. The common thread in the majority of PTSD research concerns the psychological effects of suffering trauma at the hands of other people, either through acts of war or through direct physical assault. This form of traumatic event which comprises the bulk of our knowledge concerning PTSD is called intentional-human design (IHD), (Meichenbaum, 1994).

Currently there is very little research that examines the development of PTSD in which there is no human agent, and where the traumatizing event is

impersonal in nature. Specifically, there is little information as to the psychological aftermath of industrial accidents. It is not known if the symptoms suffered are the same or different, or of differing emphasis or magnitude, as those when there is an IHD. Those studies that have examined non-IHD stressors have focused primarily on large scale natural or technological disasters, i.e. Three Mile Island (Davidson & Baum, 1986), airplane crashes (Smith et al., 1993) or large factory explosions (Weisath, 1989). The problem with the above non-IHD research is that those events are relatively rare and community responses vary widely, not necessarily providing information relevant to DSM considerations. There is a need for more research concerning events that, while outside of the normal range of experience, happen significantly more often than major disasters. Small-scale industrial accidents where only one or two people are injured occur far more frequently and account for a significantly larger portion of industrial accident PTSD (IA-PTSD) cases seen by Workers' Compensation Boards than large scale disasters, which are relatively rare in frequency.

The Present Study

The present study addressed the question of the psychological effects following industrial accidents for the purpose of better understanding IA-PTSD and possible differences between IA-PTSD and crime-related PTSD (C-PTSD). If there are significant differences found with regard to symptom presentation in

people who are traumatized as a result of industrial accidents when compared to people who are victims of deliberate human actions, then it is possible there are significant treatment and diagnostic implications. Compensation boards assess and send for treatment a significant number of IA-PTSD cases every year. Unofficial estimates from the Workers' Compensation Board of British Columbia put the number of all PTSD claims (accident and crime) at 10-30% of the total cases seen by the Psychology Department every year.

The potential impact of delineating between C-PTSD and IA-PTSD symptom presentation could be significant in terms of treatment costs and in terms of effectively focusing treatment on the most important symptoms. Armed with this information, practitioners could focus on and develop specific treatment regimens based on the symptom clusters most relevant to IA-PTSD and C-PTSD.

The present study focused on the specific symptoms experienced and expressed by the crime and accident groups. Investigating specific symptom presentation for the purpose of gaining a clearer understanding of the diagnostic criteria for PTSD has been suggested by a number of authors (Joseph, Yule & Williams, 1993; Kilpatrick & Resnick, 1993). These authors highlight the fact that PTSD is a relatively new formal DSM category and the diagnostic criteria are still very much in development. Given that there is little research about IA-PTSD, a good starting point for inquiry would be industrial accident symptom presentation in comparison to well-investigated PTSD symptom presentation

such as that which develops following crime victimization. It has been noted by several researchers (e.g., Epstein, 1993; Davis & Breslau, 1994) that there is a paucity of research concerning work-related trauma and PTSD, and that research is needed in this area to aid in understanding the full spectrum of PTSD.

Other Factors

Attribution and Locus of Control

There has been recent suggestion that attributional aspects and locus of control beliefs (Rotter, 1966) play a mediating role in the development of PTSD symptoms. Attribution and locus of control theories generally refer to the decision whether an event or behavior was caused by internal or external factors. Internal factors refer to causes that reside within the person such as personality traits or beliefs. External causes refer to the environment in which the event took place. While there is no literature that examines the role attributions play in terms of IA-PTSD, for natural disasters there is no evidence to support a causal relationship between attributions and symptoms (Joseph et al., 1993).

Attribution and locus of control may play a role in how the individual resolves and copes with the symptoms, and to long-term prognosis, but it appears that symptom presentation is too stable to be affected by attributions in

PTSD following natural disaster (Joseph et al., 1993). Given that natural disasters are non-IHD type stressors, and it appears that attributions do not play a role in symptom development, the role of attributions was not addressed in the present study. Similarly, perceptions of locus of control do not appear to play a significant role in the development of symptoms following assault. It has been found that with victims of assault, perceived control over specific assault situations does not appear to result in more severe psychopathology (Kushner, Riggs, Foa & Miller, 1992). It may be that if lack of control generalizes to other negative life events, it may result in more significant symptom presentation (Kushner at al., 1992), but the testing of the role of this construct was beyond the scope of this research.

Severity of Stressor

The notion of the severity of stressor and the development of PTSD is controversial and as of yet, unresolved in the literature. After reviewing the PTSD literature, Breslau and Davis (1987) found little empirical evidence to suggest that "extreme" stressors have a distinct effect on the nature of subsequent post-traumatic reactions in relation to "ordinary" stressful events. They suggested that personal characteristics and the nature of the social environment have more effect on the types and nature of responses. With regard to accidental injury, Feinstein and Dolan (1992) found that the severity of the accident/stressor had little association with the development of PTSD. In

one of the few studies to address accidental injury and PTSD, Epstein (1993) found no relationship between the development of PTSD and seriousness of injury, presence of head injury, length of hospital stay or level of functioning 9 months post injury. Epstein urges caution when interpreting these results however, as the sample used for the study was very small.

Research concerning proximity to stressor has found a positive relationship between how close one is to the stressful event and the development of PTSD (Weisath, 1989; Goenjian et al., 1994). Weisath (1989) found that the closer the individual was to the center of a factory explosion, the more likely that person was to develop PTSD. Goenjian et al. (1994) studied victims of the Armenian earthquake and found that proximity to the epicenter was related to the development of PTSD. However, the present study was only concerned with individuals who were direct victims of accidents or crime.

The purpose of this research was to examine symptom presentation after the development of PTSD. In light of the current research, the severity of the accident in the present study was not controlled for or coded separately.

Comorbidity of PTSD With Other Mental Disorders

Research concerning comorbidity of PTSD with other disorders has found that individuals with PTSD are at a substantially greater risk than the general population for having other mental disorders (Kilpatrick & Resnick, 1993), and that the risk for comorbid diagnoses increases as PTSD becomes chronic in

nature (Davidson & Foa, 1991). One study of PTSD in urban youth found high rates of Major Depression (36.6%), Agoraphobia (21.5%), Obsessive-Compulsive Disorder (15%) and Dysthymia (12.9%) (Breslau, Davis, Andreski & Peterson, 1991). One study that compared PTSD and comorbid diagnoses in survivors of a dam collapse and Vietnam veterans found little difference between the groups in terms of diagnosis and frequency of specific illnesses (Green, Lindy, Grace & Leonard, 1992). The authors reported that 10 percent of both groups suffered from Major Depression, and the groups were relatively equal in terms of Panic disorder (5% veterans; 4% disaster victims), Phobic Disorder (14% veterans; 9% disaster survivors) and Generalized Anxiety Disorder (10% veterans; 10% disaster survivors). A high rate of Major Depression has been found in MVA victims who have been diagnosed with PTSD and has ranged as high as 48 percent in one sample (Blanchard, Hickling, Loos & Gerardi, 1994) . Koch and Taylor (1995) suggest that there is substantial comorbidity in MVA-PTSD samples, and state that chronic pain (as well as depression) is common in subjects who present for psychological treatment. It has been observed that there are high rates of comorbid diagnoses with PTSD over a number of different stressors (i.e., war, natural and technical disasters etc.) and across varied samples (Green, 1994).

High rates of substance abuse in conjunction with PTSD have also been found in many studies with civilian populations (Breslau et al., 1991; Breslau & Davis, 1992; Kilpatrick & Resnick, 1993). In one sample with young adults who

presented with chronic PTSD (defined in this study as having the disorder for longer than one year; the DSM defines chronic as longer than 3 months), Breslau and Davis (1992) reported that 35.8% of the sample abused or depended on alcohol and 18.9% abused or depended on drugs. Twenty-five percent of the non-chronic PTSD sample were alcohol-dependent and 25% were dependent on drugs (Breslau & Davis, 1992).

When discussing comorbidity with PTSD, it is important to point out that PTSD and other disorders overlap in terms of DSM symptom items. For example, the symptoms of diminished interest, difficulties with concentration, and insomnia associated with Major Depression overlap with PTSD. Obsessive Compulsive disorder requires that the individual experiences persistent thoughts that cause marked anxiety and distress, just as with PTSD. Specific Phobia also shares many of the same symptoms as PTSD (exposure to stimulus provokes anxiety response), except that the DSM states that for a diagnosis of Specific Phobia, the phobic avoidance can not be better accounted for by another mental disorder, i.e., PTSD. Kilpatrick and Resnick (1993) point out that there is heterogeneity within PTSD as there is with many other mental disorders. Davidson and Foa (1991) argue that the evidence favors classifying PTSD as an anxiety disorder and that the literature supports the symptoms associated with PTSD as comprising a separate diagnostic entity. However, more research is needed using similar diagnostic tools to determine the extent to which other mental disorders are more likely to coexist with a diagnosis of PTSD.

Hypotheses and Rationale

Hypothesis 1

Individuals who have suffered industrial accidents with PTSD will not experience hypervigilance (D4) as the most important symptom, as measured by rank order.

Kilpatrick and Resnick (1993) reported results from a community sample of crime victims, and hypervigilance was ranked number one in terms of core presenting symptoms. Victims of crime become very aware of their environment for fear of being re-victimized, thereby becoming generally hypervigilant with regard to sounds and surroundings (Jones & Jones, 1988). In contrast, Smith et al. (cited in Smith & North, 1993) interviewed victims of an airplane crash (a non-IHD event) and found that the subjects only became hypervigilant when planes flew near by. These feelings of anxiety only surfaced when stimuli were present that directly related to the accident. Individuals involved in a non-fatal military plane crash reported becoming more aware of the dangers involved related to flying, but there was no mention of a generalized or pervasive fear being present after the crash (Slagle, Reichman, Rodenhauser, Knoedler & Davis, 1990). Individuals who had been involved in a dam collapse reported avoidance of thoughts as being the number one symptom in terms of percentage of symptoms experienced, and hypervigilance was ranked as number seven (Green, 1993).

Hypothesis 2

Individuals who have developed PTSD following industrial accidents will experience hypervigilance (D4) constrained more to environments reminiscent of the place of accident or to cues such as sounds similar to the machinery/event which caused their injury.

In recent years there has been an increasing body of literature investigating PTSD resulting from motor vehicle accidents (MVAs). In terms of small scale non-IHD PTSD, this area of research has provided useful information concerning how the stressors influence the manifestation of PTSD symptoms. Koch and Taylor (1995) report that MVA victims show increased hypervigilance with regard to potential risks while driving. In their review of the MVA literature, Taylor and Koch (1995) point out that MVA-related fears can persist for months and even years after the initial traumatic event.

Hypothesis 3

Individuals who have developed PTSD after being a victim of crime will show a more generalized anxiety condition which will appear in a greater total symptom count for criterion D (persistent symptoms of increased arousal). In particular, crime victims will exhibit a more generalized hypervigilance (D4) in comparison to industrial accident victims.

Riggs, Rothbaum and Foa (1995) found that in a sample of nonsexual assault victims who present with and without PTSD, anxiety symptoms such as fear, hypervigilance and increased startle reaction were more likely to persist

among both men and women than the reexperiencing and avoidance symptoms. In a randomized sample of Los Angeles residents, Ullman (1995) found that people who experienced combat, physical assault and war-related experiences reported more arousal and avoidance symptoms than victims of natural disasters and accidents. However, Ullman used DSM-III criteria which are not necessarily relevant to the DSM-IV definition of PTSD. Also, there was no reporting of specific symptom counts in each traumatic category which does not allow for a detailed understanding of where the differences between the groups occur.

Hypervigilance has been viewed as a conditioned anxiety symptom which has generalized to other stimuli (March, 1990). If the fear resulting from a crime generalizes, logic suggests that it would generalize from the specific stimulus, (one or two people), to people in general. In contrast, victims of industrial accidents would generalize their fear from the specific piece of equipment to similar pieces of equipment. In terms of frequency, interaction with people is more common than with industrial machinery suggesting more opportunitiesfor secondary conditioning of fear. In addition, people possess the capability for independent thought and actions, hence the possibility that criminals could repeat a crime. From this it is predicted that people who are crime victims will experience a generalized hypervigilance for their environment because of the nature of the original stressor.

Foa, Steketee and Rothbaum (1989) emphasize that the response to the stimuli can be predicted by the nature of the trauma. They note that in terms of conditioning theory, the greater the complexity of the stimuli during the stressful event the greater the generalization. It can be argued that an industrial accident represents a relatively focused stimulus that includes the specific machinery involved and the setting in which the accident took place. In contrast, crime or assaults appear to be more complex stimulus events because the source of the stress is human and the event involves some kind of interpersonal interaction with the agent.

Foa et al. (1989) offer a semantic explanation in which meaning plays a key role in hypervigilance in augmenting the conditioning theories. "Perceived threat" is the crucial factor in situations where people feel unsafe, in that people attach meaning to the stimuli and that meaning largely concerns degree of safety. From this model, because it is easier to avoid the perceived threat created by machinery, there will be less need to be generally hypervigilant, whereas pervasive hypervigilance will be necessary to avoid the perceived threat created by people.

Hypothesis 4

Victims of industrial accidents will not experience a significant decline in social activities because the nature of their trauma was not of the IHD type, while crime victims will show more social avoidance.

It has been found that crime victims are likely to experience a decrease in social activities (Hanson et al., cited in Meichenbaum, 1994) related to fear of re-victimization. This fear leads to problems with social functioning, with the individual becoming socially isolated and fearful about leaving the relative safety of the home (McCann, Sakheim & Abrahamson, 1988). In contrast, a study examining PTSD in burn victims (a non-IHD stressor), found that only 14 percent of subjects at time of discharge experienced any decline in social activities (Roca, Spence & Munster, 1992).

Method

Subjects

The data for the study was supplied from the archival psychology reports located in the Psychology Department of the Workers' Compensation Board in Richmond, British Columbia (N=82: crime=48; accident=34). No attempt to contact the claimants was made. Only those files were used where there was a diagnosis of PTSD in relation to a crime of robbery or assault, or an industrial accident. Files of victims who had experienced sexual assault, sexual harassment or those files located in the Criminal Injury Unit (crimes that occur outside of the work environment) were not used. Events where a worker developed PTSD as a result of injuring another person or witnessing injury to others were not included. Therefore, only those cases where the subject experienced a direct threat to his or her personal safety were used for this study.

Diagnoses of PTSD were made by Ph.D. Clinical Psychologists who are registered with the British Columbia College of Psychologists who were either employed by the Workers' Compensation Board or contracted by the Board to conduct assessments. Diagnoses were based on interviews using DSM criteria.

Forty-eight males and 34 females comprised the sample. Nineteen males and 29 females were in the crime category, and 29 males and five females were in the accident category. Mean age of subjects was 37. 59 years (SD=10.02), and mean years of education was 11.69 (SD= 2.91). Mean time elapsed from injury till time of assessment was one year and 3 months (SD = 3.89 years). Analysis of variance (ANOVA) determined that there was no difference between time of injury and time of assessment across the crime and accident groups, F (1, 80) = 2.98, $p > .05$. Mean number of years at job was 7.65 (SD=7.12). Premorbid psychological history was recorded as none, adolescent assessment, adolescent inpatient, adolescent outpatient, adult assessment, adult inpatient or adult outpatient (Table 1).

Table 1

Adult and Adolescent Premorbid Psychiatric History

	IA-PTSD	C-PTSD	Total
Adolescent			
Inpatient	0	0	0
Outpatient	0	2	2
Assessment	0	1	1
None	34	45	79
Adult			
Inpatient	1	0	1
Outpatient	1	4	5
Assessment	0	0	0
None	32	44	76

Measures

The variables examined were the DSM IV criteria for PTSD as presented by victims of crime in comparison with victims of industrial accidents. Comparisons between the two groups were made to ascertain differences in presenting symptoms and to determine the nature of the differences.

Traumatic Category

Trauma was coded as industrial or criminal.

Symptoms

The symptoms were grouped according to the criteria provided in the DSM-IV, in particular criterion B (persistent reexperiencing of trauma), C (avoidance and numbing) and D (increased arousal). Each of the seventeen DSM-IV symptoms included in criteria B, C, and D were coded as either present or not present. In order to test the hypothesis regarding pervasive hypervigilance, I delineated three settings where the subject reported experiencing hypervigilance: at work, in social settings, and at home. It was then determined if the hypervigilance displayed in these settings was either specific or pervasive. Specific hypervigilance referred to those times when the subject reported hypervigilance in the presence of specific stimuli, whereas pervasive hypervigilance referred to those times when the subject experienced a general sense of hypervigilance regardless of what actual stimuli were present. For example, if a subject reported feeling hypervigilant and unsafe when out in public, then this was coded as pervasive hypervigilance in social settings. If the subject reported being hypervigilant only when driving a car (in a non-work situation), then this was coded as specific hypervigilance in social settings. The coding format for symptoms and settings is shown in Appendix A. Inter-rater reliability was assessed using 20 percent of the data, revealing a mean *kappa* of 0.71. It was conducted by a Ph.D. level psychologist employed by the Workers' Compensation Board of British Columbia. Appendix B presents the *kappa* obtained for each symptom.

Place of injury/crime was recorded as hospital, psychiatric hospital, retail, food service, clerical/administrative, factory, prison, construction site, forestry, and motor vehicle accident (Table 2).

Table 2

Setting of Industrial Accidents and Crimes

Setting	IA-PTSD	C-PTSD	Total
Hospital	0	3	3
Psychiatric Hospital	1	5	6
Retail	1	34	35
Factory	6	0	6
Construction	14	0	14
Forestry	1	0	1
Clerical/Administrative	0	2	2
Food Service	2	1	3
Fishery	3	0	3
Prison	0	3	3
Motor Vehicle Accident	6	0	6

Results

Hypothesis 1 predicted that individuals who have suffered industrial trauma would not experience hypervigilance as the top ranked symptom.

Table 3 illustrates the percentages and rank ordering of symptoms experienced by the crime and accident groups. The rank order of each symptom appears in brackets to the right of the percentage of symptoms experienced by each group. Hypervigiliance (D4) was rank ordered at number one for both groups.

Table 3

Percentage and Rank Order of Symptoms Experienced by Group

Symptom	Crime	Accident
B1: Intrusive Thoughts	85 (2)	85 (1)
B2: Dreams	79 (4)	79 (3)
B3: Acting/feeling as event were happening	21 (14)	38 (9)
B4: Distress at internal/external cues	69 (7)	82 (2)
B5: Physiological reactivity to cues	69 (7)	79 (3)
C1: Avoid thoughts, feelings, conversations	50 (12)	53 (8)
C2: Avoid places activities	60 (11)	62 (7)
C3: Inability to recall important aspect	6 (15)	6 (12)
C4: Diminished interest/participation in activities	75 (5)	74 (5)
C5: Detachment	73 (6)	59 (7)
C6: Restricted affect	64 (9)	52.9 (8)
C7: Foreshortened future	29 (13)	32 (11)
D1: Difficulty falling/staying asleep	83 (3)	77 (4)
D2: Irritability	63 (10)	74 (5)
D3: Difficulty concentrating	75 (5)	70 (6)
D4: Hypervigilance	91 (1)	85 (1)
D5: Startle	67 (8)	35 (10)

Hypothesis 2 predicted that people who had developed PTSD following industrial accidents would experience hypervigilance (D4) constrained more to environments reminiscent of the place of accident or to cues such as sounds similar to the machinery/event which caused their injury. It was also predicted that crime victims would experience a more generalized sense of hypervigilance (D4) in comparison to accident victims.

Results indicate that victims of crime experience a significantly more generalized or pervasive sense of hypervigilance in all three defined settings: at home, in social settings, and at work, when compared to people who are victims of accidents. Accident victims experienced a more context-specific hypervigilance than crime victims. Tables 4a, 4b and 4c present the actual number of subjects in each category based on how they experience hypervigilance at home, in social settings, and at work.

Table 4a

Hypervigilance Experienced at Home

Setting	None	Specific	Pervasive
Crime	23	0	25
Accident	21	10	3

Note: χ^2 (2, $\underline{N}$ = 82) = 25.74, $\underline{p}$ < .05

Table 4b

Hypervigilance Experienced in Social Settings

Setting	None	Specific	Pervasive
Crime	15	0	33
Accident	15	13	6

Note: χ^2 (2, N = 82) = 30.18, p < .05

Table 4c

Hypervigilance Experienced at Work

Setting	None	Specific	Pervasive
Crime	6	3	39
Accident	5	24	5

Note: χ^2 (2, N = 82) = 41.52, p < .05

Hypothesis 3 predicted that crime victims with PTSD would show a more generalized anxiety condition which will appear in a greater total symptom count for criterion D (persistent symptoms of increased arousal).

Crime victims exhibited significantly more arousal symptoms than accident victims χ^2 (3, N = 82) = 8.57, p < .05. The mean number of symptoms for the crime group was 3.81 and the mean number of arousal symptoms for the accident group was 3.38, (t (80) = 2.23, p < 0.05). Table 5 illustrates the distribution of arousal symptoms in terms of number present for crime and

accident victims. There was no difference between crime or accident victims in terms of symptom counts in the re-experiencing (B) or avoidance (C) categories.

Table 5

Arousal Symptom Counts

Number of Symptoms	IA-PTSD	C-PTSD
2	7	1
3	12	16
4	10	22
5	5	9

Hypothesis 4 predicted that industrial accident victims would not experience a significant decline in social activities (C4) when compared to crime victims.

Diminished interest/participation in activities (C4) was rank ordered at number 5 for both groups. Comparisons were made across individual symptoms and the only significant difference found between the crime and accident groups was exaggerated startle response (D5). In total, the crime victim group experienced significantly more startle responses than accident victims, χ^2 (1, $\underline{N}$ = 82), = 7.88, $\underline{p} < .05$.

Because of the high number of subjects who developed PTSD as a result of working in and being the victim of crime in a retail setting (n=34), analyses were performed to investigate symptom characteristics within this sub-group.

The retail-crime group was comprised of 17 males and 17 females. There were no significant differences between males and females in terms of how hypervigilance manifested, however, there was a trend in that females were more likely than males to experience a generalized sense of hypervigilance in social settings when compared to males, χ^2 (1, $\underline{N}$ = 34) = 3.36, $\underline{p}$ = 0.06. There was no difference in number of symptoms within criterion B, C, and D between males and females in this sub-group.

Comorbid Diagnoses

In terms of comorbid diagnoses, no subjects were diagnosed with Obsessive Compulsive Disorder, Substance Abuse, or as having Somatization Disorder. Nineteen cases had comorbid diagnoses of Major Depression (7 men and 12 women) and four subjects (3 men and 1 woman) had comorbid diagnoses of Panic Disorder. The diagnosis of Major Depression was distributed relatively evenly across all of the categories and settings, as shown in Table 6.

Table 6

Comorbid Diagnoses of Major Depression By Setting

Setting	IA-PTSD	C-PTSD	Total
Hospital	0	2	2
Psychiatric Hospital	0	2	2
Retail	0	7	7
Factory	1	0	1
Construction	2	0	2
Clerical/Administrative	0	1	1
Fishery	2	0	2
MVA	2	0	2

Time Since Traumatic Event

There was no significant relationship between number of symptoms and time from injury till time of assessment across the three symptom clusters (B: Reexperiencing: $r = .10$, C: Avoidance: $r = -.04$, D: Arousal: $r = .03$,). In short, there was no evidence to suggest that the longer an individual has PTSD, the more likely that person is to have and or develop more or fewer symptoms.

Discussion

The two groups did not differ in terms of the rank order placement they gave to hypervigilance, which was first for both groups. In contrast, the two groups did differ in the pervasiveness of their experience of hypervigilance. Those who were victims of crime and developed PTSD as a result, experienced a more generalized and pervasive sense of hypervigilance than did victims of accidents.

These results suggest that the nature of the stressor does have an impact on the presentation and manifestation of PTSD symptoms. When the nature of the stressor is known to be deliberate and intentional, the overall sense of safety the individual experiences is greatly compromised and this affects more aspects of the individual's day-to-day functioning. The crime victim is no longer able to feel safe in a "world of other people" and becomes generally preoccupied with fear of recurrence (Janoff-Bulman, 1985). Accident victims, however, experience a threat to their safety in more constrained, context-specific situations similar to the accident stimuli, (i.e., walking past equipment that was responsible for the accident) or in direct exposure to the original trauma (i.e., returning to work on the machinery that injured them).

The two groups did not differ in the extent to which they avoided social activities, contrary to prediction. There was no significant difference between crime and accident victims in terms of diminished interest/participation in activities (criterion C4). Diminished interest in participation and avoidance of

activities were both rank-ordered at number five in terms of frequency. However, in light of the evidence showing that crime victims experienced a more pervasive hypervigilance in social settings, there may be an underlying difference in why these groups do not participate in social activities. Crime victims do not venture out in public for fear of being revictimized, but with accident victims, personal injury as a result of the accident may be responsible for being physically unable to participate in social activities. This speculation is not consistent with the data however, as those files where injury clearly prevented the participation in social activities were noted as such by the psychologists conducting the interviews.

Another explanation concerning decreased social participation may be provided in the numbing hypothesis suggested by Foa, Riggs and Gershuny (1995). They conducted a factor analysis of rape victims and female nonsexual assault victims which helps to explain the issue of decreased social participation. Foa et al., (1995) argue that the diminished interest/participation symptom is part of a factor they termed numbing. They report that hypervigilance loaded on a factor they termed intrusion/effortful avoidance and argue that numbing occurs when effortful avoidance is incapable of reducing arousal.

In terms of the present study, this would mean that when efforts at hypervigilance (effortful avoidance) do not reduce arousal, then numbing would occur (which may include decreased social participation). When considering crime victimization and the pervasive vigilance associated with being a victim of

crime, then it would appear that social avoidance does not only represent a numbing symptom, but a conscious attempt at reducing the possibility of revictimization. The difference between the crime and accident victims may be one of perceived danger. The threat of revictimization in terms of crime is more of an uncontrollable factor, and a diminished interest/participation in activities in crime victims may not only represent a numbing symptom, but also an active attempt to avoid being revictimized. In accident victims, avoidance of social activities may represent more of a "pure" numbing symptom as proposed by Foa et al. (1995) resulting from intrusive images associated with the accident.

The power of fear of revictimization is further supported by the higher number of arousal symptoms experienced by crime victims when compared to accident victims. A higher number of arousal symptoms suggests a heightened overall level of discomfort that may be related to a persistent sense of general vulnerability. It is possible that the arousal symptoms associated with C-PTSD stem more from a fear of revictimization, and that the arousal symptoms associated with IA-PTSD may be more related to memories concerning the traumatic event.

It is interesting to note that the symptom profiles for both categories are relatively similar. The only significant difference in terms of specific symptoms was exaggerated startle response, in which crime victims were more likely than accident victims to display this symptom. Given that the nature of the stressor in crime victims was of the IHD type and that crime victims experience a more

pervasive hypervigilance, then it would seem plausible that subjects who are victims of crime would be more likely to interpret ambiguous stimuli in the environment as potentially threatening.

Similarity of symptom profile across groups has also been found with torture and earthquake victims (Goenjin et al., 1994). These researchers, however, point out that even though natural disaster-related PTSD and torture-related PTSD are similar in terms of symptom presentation, they argue that the psychological sequelae following human perpetrated violence is different from natural disaster related PTSD. There are psychological reactions to these different phenomena that may not be measured by the current DSM definition of PTSD. This suggests that the manifest content of the symptoms is similar but the latent content may be somewhat different. The present study would tend to support that notion because of the possible differences underlying the driving force behind the arousal and hypervigilant symptoms in crime and accident victims.

Of interest to this study is the trend noticed that women who are crime victims in a retail setting experience a more pervasive sense of hypervigilance in social settings when compared to men who are victims of crime in retail settings. Riggs et al., (1995) did not find any difference between men and women crime victims in terms of patterns and severity of symptoms, but did cautiously note that women were more likely to develop chronic PTSD than men, and Breslau and Davis (1992) state more confidently that being female is a risk factor

associated with developing chronic PTSD. Goenjin et al., (1994) also found no gender differences with respect to symptom presentation or severity in a sample of torture and earthquake victims. Norris (1992) reports that women who have experienced violent crime are more likely to satisfy diagnostic criteria for PTSD. The present study suggests that women victims of retail crime feel more vulnerable than male victims of crime in social settings. Given the small sample these results are tentative at best, but do suggest that there are underlying differences in how people experience and express symptoms based on gender.

Major Depression was the most common comorbid diagnosis made in conjunction with PTSD. This finding is similar with that of other studies which finds similarly high levels of Major Depression concurrent with a diagnosis of PTSD (e.g., Breslau et al., 1991). There were low levels in terms of frequency of all other comorbid diagnoses and of particular interest, there was no diagnosis of Substance Abuse. Social desirability may have played a part in symptom reports with regard to substance abuse in that subjects may have been reluctant to tell the interviewers because of the possibility that such a disclosure might impede the possibility of receiving compensation.

The rarity of a number of DSM-IV criteria deserves some comment. "Acting as if event were happening" (B3) and "inability to recall an important aspect of event" (C3) symptoms were both low in terms of presence across both crime and accident categories. Other studies (e.g. Blanchard et al., 1995) have also found relatively low numbers of these symptoms in their samples. In a

study comparing Vietnam veterans and MVA victims, it was found that MVA victims reported "hallucinatory" experiences far less and when they did occur, they were experienced for much briefer time periods and the hallucinations were of a specific, focused content, i.e., the car accident (Burstein et al., 1988). In contrast Vietnam veterans were much more likely to experience a reliving of the war experience in which they believed themselves to be back in Vietnam and that these hallucinations lasted much longer than those experienced by the MVA group (Burstein et al., 1988). Loughrey, Bell, Kee, Roddy and Curran (1988) also found very low numbers of "acting as if the event were recurring" in their sample of victims of terrorist and civilian violence. Loughrey et al. (1988), argue that "acting as if it event were recurring" should be noted as an associated feature and not as a requirement for a diagnosis. Even in some veteran populations, "flashbacks" and psychogenic amnesia have been reported as occurring relatively infrequently (28.1% and 33% respectively; Roszell, McFall & Malas, 1991). Because of the low reporting of these two symptoms in civilian samples, in the present study, and the inconsistent finding in veteran populations, serious questions arise as to the diagnostic utility of these two symptoms in the concept of PTSD.

The role and usefulness of event amnesia (criterion B3) in the diagnosis of PTSD in civilian populations needs to be addressed. This symptom is not reported with great regularity in the literature and the present study similarly found a very low frequency for event amnesia. This symptom is consistently

ranked the lowest in terms of frequency and may be best described as an associated feature rather than serving as a possible diagnostic criterion. The whole area of event amnesia in civilian populations needs to be researched further with particular emphasis placed on diagnostic utility and usefulness.

Limitations of Present Research

Differing assessment methods makes direct comparisons of this study to others tentative at best. The present study used data from reports written by psychologists who made their diagnoses largely on the basis of semi-structured interviews. As yet, there seems to be no widely used, standardized diagnostic PTSD measure and as a result, past and present PTSD research concerning diagnostic issues use a number of different assessment tools. A survey of the PTSD literature shows that a heterogeneity of assessment procedures across studies is common in PTSD research, and this makes comparison within the literature difficult. Also, because of the nature of the data in the present study, it was not possible to control for severity of symptom presentation. Good self-report measures could help to identify possible differences in symptom severity. It is possible that there may be a difference in symptom severity related to the nature of the stressor. Data limitations may also have affected the quality of premorbid data. Premorbid psychiatric history in the present sample was assessed by simply asking the subject about previous experiences with mental health professionals. A more detailed life history may have provided evidence

concerning variables which may have constituted a difference between the groups.

Symptom reports during the assessment interview may have been affected by deliberate attempts to bias, in order to receive a compensation award. Lees-Haley & Dunn (1994) found that 86% of a sample of naive subjects were able to endorse symptoms on checklists that would meet the DSM-III-R criteria for PTSD. I conclude this was probably not a major source of bias as the present study used experienced clinical psychologists who conducted semi-structured interviews who were aware of the ability of subjects to endorse false symptoms, and were familiar with the role that secondary gain might play in the compensation setting. Taylor and Koch (1995) reported clinical observations and other emperical studies suggesting that PTSD symptoms persisted in subjects who had received compensation settlements. Guest and Drummond (1992) have also found that symptoms of chronic pain continued long after the subjects had received compensation settlements for their injuries.

The sample of crime victims was comprised in large part of individuals who were victims of robbery in retail stores. Using victims who have been robbed or assaulted in their home or outside of work environments would make the results of this study more generalizable to the public. There could be a significant difference between being a crime victim in the home as opposed to being a crime victim in a work environment.

Finally, the possibility that accident victims do not experience hypervigilance, but really only express a Specific Phobia must be discussed. Two points will help to address this important issue. First, Koch (1994) points out in a review of MVA related PTSD that as many as 11% of individuals will qualify for a full diagnosis of PTSD and that as many as 33% will experience significant psychological distress. Koch (1994) points out that the DSM criteria of "an all or none" diagnosis of PTSD does not do justice to the dimensional nature of the disorder.

Although it is not entirely clear what factors related to the accident or the individual will cause full PTSD, the important point is that PTSD resulting from a specific accident-related stressor has been found in other samples. Further, only those files where there was a full diagnosis of PTSD were used for this study. The DSM-IV clearly states that for a diagnosis of Specific Phobia, the fear of the object or situation must be unreasonable and excessive. Given the experiences of crime and accident victims, it may be difficult to argue that the fear resulting from the stressor is unreasonable unless there is further definition of event characteristics that include objective levels of severity. Finally the DSM states that the symptoms of Specific Phobia must not be better accounted for by PTSD. Given the high number of intrusive and reexperiencing symptoms found in the present sample, it would seem that the subjects received the correct diagnosis of PTSD. Even if one were to argue that the nature of the hypervigilance experienced in accidents was in reality a Specific Phobia, then

one could easily argue that crime victims experience a similar phobic reaction, the only difference being that they have become phobic of people as opposed to machinery. However, the purpose of the present study was not to dispute or challenge the nature of the current definition of PTSD and related symptom structure, the purpose was to examine differences in symptom presentation based on type of stressor.

In another attempt to differentiate event-related distress disorders, Kuch, Evans, Watson & Bubela (1991) use the term Accident Phobia (with regards to MVAs) which they define as meeting the DSM-III-R criteria for Simple Phobia; the fear content must be associated with the MVA, and the individual's anxiety symptoms and behaviors must center around excessive fears of potential repetition of the MVA. The term accident phobia was later redefined to include meeting in part the DSM-III-R criteria A, B, C, and D for PTSD (Kuch, Cox, Evans & Shulman, 1994). While Accident Phobia may be a useful construct and warrant further research (especially with regard to IA-PTSD), Accident Phobia is currently not a DSM category and the purpose of this study was to investigate PTSD symptoms in crime and accident victims relevant to DSM considerations. Further, Kuch et al. (1994) state that 38.1% of their sample met the criteria for both Accident Phobia and PTSD which would suggest considerable overlap between the disorders. Accident Phobia may be a useful term to describe subdromal PTSD, but further research is needed to determine if PTSD and Accident Phobia deserve separation as two distinct classes of Anxiety Disorders.

Future Considerations

The present study has identified a relationship between the type of stressor and the nature of symptom presentation. Future research could further delineate the different reactions of the two groups by examining the nature of the hypervigilance experienced. This research could determine if the hypervigilance experienced by crime and accident victims is experienced out of memories associated with the attack, and/or fear associated with revictimization (or reinjury), and help determine which has a greater influence on the existence and persistence of the anxiety symptoms.

A larger and more heterogeneous sample of accident victims could help to delineate symptom differences between types of accidents. Given that there seems to be symptom differences associated with the general nature of the stressor, then it would follow that there may be differences within each general category depending on the "subclass" of stressor within each group. Research in the area of crime is already examining these "subclass" differences (e.g., impact of stranger vs nonstranger rape; Katz, 1991; Gidycz & Koss, 1991) with some clear patterns emerging.

It would be useful to conduct more complete assessments with accident victims to assess the role of personal characteristics, social support, and detailed premorbid life history to understand the effect these variables have on symptom presentation in IA-PTSD. Joseph et al. (1993) states that these

variables may play a part in the course of chronic PTSD and it would be useful for those who treat long term IA-PTSD victims to be aware of these factors should they be relevant. Further, it has been reported that subjective impact of injury, effect of injury on employment and financial status, and family environment play a role in the stress experienced by traumatic injury victims (Landsman, Baum, Arnkoff & Craig, 1990). Understanding these variables in industrial accident victims who suffer from PTSD would provide useful information concerning the expected course of PTSD, and recovery.

Conclusion

This study has provided preliminary evidence to suggest that the major underlying difference between C-PTSD and IA-PTSD is in the nature of how hypervigilance is experienced. Crime victims experience a much more generalized and pervasive sense of hypervigilance when compared to industrial accident victims. It would appear that when the nature of the stressor is of the IHD type, then the subject will experience more anxiety symptoms related in part to the fear of revictimization. Further research concerning social and personal variables could help to further delineate the symptom patterns experienced by these two groups.

Every year there is a large number of industrial accidents resulting both in physical injury, and in some cases, PTSD for the workers involved. Workers' Compensation Boards also refer for treatment a large number of workers who

have been the victims of crime while on the job. The findings of this study help to further understand differences between IA-PTSD and C-PTSD, and can also aid in designing subsequent treatment programs. The information provided in this research could be useful in helping to more fully understand the clinical course and outcomes of the disorder, and thereby more effectively treat the symptoms of those clients affected.

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Appendix A:

Coding Instrument

Date coded:_____
MMPI:_____
Subject name:_____
File number: _____

Crime_____ Accident_____
Age:_____
Gender:M___ F____
Education: _____yrs
Years at job:_____

Date of injury: Year_____Month_____Day_____
Date of assessment: Year_____Month_____Day_____

Symptoms	Severity: 0 1 2 3	
B: Reexperiencing		
Intrusive	_____	H W S
Dreams	_____	H W S
Acting/feeling as if it were happening	_____	H W S
Distress at internal/external cues	_____	H W S
physiological reactivity to cues	_____	H W S
Total Present_____		
C: Avoidance and Numbing		
Avoid thoughts, feelings, conversations	_____	H W S
Avoid places, activities	_____	H W S
Inability to recall important aspect	_____	H W S
Diminished interest/participation in activities_____		H W S
Detachment	_____	H W S
Restricted affect	_____	H W S
Foreshortened future	_____	H W S
Total Present_____		
D. Increased Arousal		
Difficulty falling/staying asleep	_____	H W S
Irritability/outbursts of anger	_____	H W S
Difficulty concentrating	_____	H W S
Startle	_____	H W S
Hypervigilance	_____	H W S

Work
Specific/limited 1
Generalized 2
Social
Specific/limited 1

Generalized 2
Home
Specific/limited 1
Generalized 2

Total Present_____

Comorbid:

OCD 1
Major Depressive Disorder 2
Substance Abuse 3
Somatization Disorder 4
Panic 5

Setting:

Hospital 1
Psychiatric Hospital 2
Retail 3
Factory 4
Construction 5
Forestry 6
Clerical/administrative 7
Food Service 8
Fishery 9
Prison 10
MVA 11

Premorbid psychiatric history

Adult inpatient 1
outpatient 2
assessment 3
none 0

Adolescent inpatient 1
outpatient 2
assessment 3
none 0

Appendix B:

Reliability of Symptoms Shown as *kappa* Coefficients

Symptom	*kappa*
Intrusive Thoughts	0.82
Dreams	0.51
Acting/feeling as if event were happening	1.00
Distress at internal/external cues	0.75
Physiological reactivity to cues	0.55
Avoid thoughts, feelings, conversations	0.65
Avoid places activities	0.37
Inability to recall important aspect	0.64
Diminished interest/participation in activities	0.65
Detachment	0.56
Restricted affect	0.61
Foreshortened future	0.57
Difficulty falling/staying asleep	0.82
Irritability	1.00
Difficulty concentrating	0.62
Startle	0.77
Hypervigilance	1.00
Hypervigilance at work	0.73
Hypervigilance in social settings	0.81
Hypervigilance at home	0.73