An Assessment of Post-Traumatic Stress Disorder and Psychology and Physical Health Comorbidity among Law Enforcement Officers

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Terri L. Belville
A qualitative survey was employed to gather descriptive information on Post-traumatic Stress Disorder (PTSD) and collateral psychological and physical health conditions among law enforcement officers. Three diagnostic assessment instruments for PTSD were utilized including a self-report traumatic stress questionnaire to screen for PTSD, as well as provide information on the range of personal and on-the-job traumatic events experienced by officers. At a structured clinical follow-up interview the C-DIS-R and MCMI-III were used to verify a diagnosis of PTSD and establish psychological comorbidity on Axis I and II, respectively. A self-report physical health questionnaire was also used to assess for physical health comorbidity at the interview.

Eight (21%) of the 38 officers who participated were assessed by the C-DIS-R to have PTSD. Non-parametric analyses revealed that these PTSD-positive subjects, on average, had more Axis I and physical health collateral conditions than PTSD-negative subjects, but fewer Axis II disorders. This same trend held true for PTSD-positive subjects in comparison to the total sample. Chi-Square analysis revealed that PTSD-positive subjects were significantly more likely to meet diagnostic criteria for somatoform pain disorder, major depressive episodes, manic episodes, bipolar disorder, depressive episodes of a melancholic type, depression NOS, aggressive-sadistic personality disorder, gastrointestinal problems, fatigue, weight loss and chronic pain.
# TABLE OF CONTENTS

**ACKNOWLEDGMENTS** ................................................................. ii  
**LIST OF TABLES** ........................................................................ v  
**INTRODUCTION** ................................................................. 1  
  Etiological Models .................................................................. 5  
    Behavioral ...................................................................... 6  
    Biological ....................................................................... 7  
    Cognitive/ Information Processing ............................................. 10  
    Psychodynamic ................................................................. 12  
  Treatments ........................................................................... 14  
  PTSD and Psychological Comorbidity ............................................ 19  
  Psychological Comorbidity and Treatment Issues ............................... 24  
  PTSD and Physical Health Comorbidity .......................................... 26  
  Problem Statement ................................................................... 29  
**METHOD** ................................................................................ 35  
  Subjects ............................................................................... 35  
  Setting ................................................................................ 35  
  Materials and Apparatus ............................................................. 36  
    Self-report Measures .......................................................... 36  
    Structured Interview .......................................................... 39  
  Procedure .............................................................................. 41  
  Human Subjects Protection ......................................................... 46  
**RESULTS** ................................................................................. 51  
  Preliminary Results ............................................................... 51
Table of Contents - Continued

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preliminary Analysis</td>
<td>52</td>
</tr>
<tr>
<td>Screener</td>
<td>52</td>
</tr>
<tr>
<td>Physical Health Questionnaire</td>
<td>53</td>
</tr>
<tr>
<td>C-DIS-R</td>
<td>56</td>
</tr>
<tr>
<td>MCMI-III</td>
<td>59</td>
</tr>
<tr>
<td>PTSD Assessment Measure Comparison</td>
<td>60</td>
</tr>
<tr>
<td>Relationships Between Measures</td>
<td>62</td>
</tr>
<tr>
<td>DISCUSSION</td>
<td>70</td>
</tr>
<tr>
<td>Limitations</td>
<td>74</td>
</tr>
<tr>
<td>Recommendations</td>
<td>75</td>
</tr>
<tr>
<td>APPENDICES</td>
<td></td>
</tr>
<tr>
<td>A. DSM-IV Diagnostic Criteria for Post-traumatic Stress Disorder</td>
<td>76</td>
</tr>
<tr>
<td>B. Traumatic Stress Questionnaire</td>
<td>78</td>
</tr>
<tr>
<td>C. Physical Health Questionnaire</td>
<td>82</td>
</tr>
<tr>
<td>D. Phone Script for Recruitment</td>
<td>86</td>
</tr>
<tr>
<td>E. Departmental Recruitment Approval</td>
<td>89</td>
</tr>
<tr>
<td>F. Departmental Recruitment Letter</td>
<td>91</td>
</tr>
<tr>
<td>G. Recruitment Script</td>
<td>93</td>
</tr>
<tr>
<td>H. Demographic Questionnaire</td>
<td>96</td>
</tr>
<tr>
<td>I. Consent for Publication or Presentation of Identifiable Data</td>
<td>98</td>
</tr>
<tr>
<td>J. Consent Form for Subject Participation</td>
<td>100</td>
</tr>
<tr>
<td>K. Human Subjects Institutional Review Board Approval</td>
<td>103</td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>105</td>
</tr>
</tbody>
</table>
LIST OF TABLES

1. Screener PTSD Symptomatology Across Subjects by DSM-IV Symptom Clusters .......................................................... 54
2. Frequency of Total Number of Lifetime Physical Health Conditions ............... 54
4. Prevalence of C-DIS-R Diagnoses Among Law Enforcement Officers............. 57
5. Triggering Events for Current and Lifetime PTSD on the C-DIS-R............... 58
6. Prevalence of MCMI-III Diagnoses Among Law Enforcement Officers........... 59
7. Diagnostic Agreement for PTSD Across Measures........................................ 61
8. Rates of C-DIS-R Axis I Diagnoses Co-Occurring With C-DIS-R PTSD Among Law Enforcement Officers ........................................... 64
9. Prevalence Rates of MCMI-III Diagnoses Co-Occurring With C-DIS-R PTSD ................................................................. 65
11. Rates of Physical Health Conditions Co-Occurring With MCMI-III PTSD ........ 68
12. Psychological and Physical Health Comorbidity Rates Among C-DIS-R and MCMI-III PTSD+ and PTSD- Subjects ........................................ 69
INTRODUCTION

Post-traumatic Stress Disorder has been recognized as a formal psychological diagnosis since its introduction into the Diagnostic and Statistical Manual of Mental Disorders, Third Edition (DSM-III) in 1980 (American Psychiatric Association, 1980). Due to the nature of symptoms that are necessary for a diagnosis of PTSD, this syndrome was originally classified as an anxiety disorder. Since the inclusion of PTSD in the third edition, the DSM has undergone several revisions including the DSM-III-R and recently, the DSM-IV, wherein PTSD has retained its status as an anxiety disorder (American Psychiatric Association, 1994). Criteria for PTSD have been changed slightly throughout the revisionary process; however the diagnosis still represents a disorder whereby a pathological response to traumatic stress is the primary focus (Jones & Barlow, 1990). Unlike many disorders in the DSM-IV, PTSD is unique in that its etiology (i.e. traumatic environmental antecedent) is identified as part of the diagnostic criteria (Sutker, Uddo-Crane, & Allain, 1991). In reaction to past controversy over what constitutes a traumatic experience (Robins, 1990), the DSM-IV has attempted to clarify this criteria by specifying the types of events/situations that qualify as "traumatic stressors". Therefore, the first criterion for a diagnosis of PTSD is exposure to a traumatic stressor whereby the person experienced, witnessed or was confronted with an event or events that involve actual or threatened death, serious injury, or threat to physical integrity of self or others (American Psychiatric Association, 1994). In addition, the person who has either experienced, witnessed or been confronted with any one of these traumatic events must also respond to the traumatic stressor with either intense fear, helplessness, or horror according to DSM-IV diagnostic criteria. In other words, exposure to a traumatic stressor is not sufficient for
development of PTSD to occur. PTSD is also determined by the victims subjective reaction to the traumatic stressor. Ironically, not everyone faced with a traumatic event suffers from the disorder-an interesting phenomena of PTSD.

Among those who do develop PTSD, the disorder is characterized by three clusters of symptoms that manifest themselves following exposure to a traumatic stressor: (1) intrusive reexperiencing of the traumatic stressor (2) avoidance of trauma related stimuli or numbing of general responsiveness, and (3) increased arousal (see Appendix A for complete DSM-IV diagnostic criteria). Research on PTSD has lead to the finding that across different trauma populations, the symptom profile tends to be similar. In other words, across those groups studied most often in the PTSD literature (i.e. survivors of war, rape, natural disaster, and violent crimes) subjects report similar symptoms despite the nature of the traumatic event encountered. PTSD related symptoms must be present for more than one month and cause clinically significant distress or impairment in social, occupational, and/or other important areas of functioning in order for the diagnosis to be complete (American Psychiatric Association, 1994).

This last criteria, interference in life functioning, was a new addition in the DSM-IV, but researchers in the area of PTSD have noted the profound affect this disorder can have on interpersonal functioning for some time now. For instance, research has found that PTSD sufferers commonly experience aversive states of pervasive and unpredictable fear and anxiety which can put them at risk for impairment in interpersonal and professional functioning (Davidson & Foa, 1991; Foa, Steketee, & Rothbaum, 1989). More specifically, VanderKolk (1988) identified four effects of PTSD on interpersonal functioning: (1) decreased feeling of control, (2) difficulty modulating intimacy, (3) poor tolerance for arousal, and (4) preoccupation with the trauma at expense of life experiences.
The negative psychological consequences of PTSD make it an important disorder to study, especially when recent studies indicate that the prevalence of PTSD may be increasing in the United States (Breslau, Davis, Andreski, & Peterson, 1991; Norris, 1992). A review of the PTSD literature reflects that older studies report a range of prevalence rates, but when studies are separated by samples (i.e. community versus at risk) some consistent patterns arise. In general, these older studies suggest that prevalence rates are lower among the general population, but rise dramatically for at risk populations (i.e. individuals exposed to extraordinary traumatic events).

Some of the earliest data on prevalence rates of PTSD come from large scale community epidemiological studies. Shore, Vollmer, & Tatum (1989) reported that the lifetime prevalence of PTSD in a rural northwest community sample (N=1025) was 2.6% yet jumped to 3.6% if those interviewed lived in an area where a natural disaster had recently occurred (i.e. eruption of Mt. St. Helen). Likewise, Kulka, Schlenger, Fairbank, Hough, Jordan, Marmar & Weiss (1990) determined that the rate of PTSD in the general population was approximately 2% (cited in Sutker et al., 1991). They reported a much higher rate of PTSD among community based Vietnam combat veterans (15-31%) however.

A somewhat lower community rate was obtained by Helzer, Robins, & McEvoy (1987), when results of their epidemiological study (N=2493) produced a 1% lifetime prevalence rate among the general population. A more recent epidemiological study by Davidson, Hughes, Blazer, & George (1991) which included 2,985 subjects, similarly found a slightly lower lifetime rate in the general population (1.3%). Interestingly though, Helzer et al. (1987) found higher rates for individuals exposed to physical attack (3.5%), non-wounded Vietnam veterans (3.5%), and wounded Vietnam veterans (20%).
Several other studies have reported higher prevalence rates for at risk samples as well. Kilpatrick et al (1987) interviewed crime victims and found that 27.8% of those interviewed met a lifetime diagnosis of PTSD (cited in Kilpatrick et al., 1989). Pynoos et al. (1987) using an interview format as well, reported a 58% prevalence rate of PTSD among a sample of school children exposed to a sniper attack. A similar trend was discovered in fire fighters exposed to an extreme bush fire disaster when McFarlane (1989) reported that among 315 fire fighters interviewed, the prevalence of PTSD at 4, 11, and 29 months post-trauma was 32%, 27%, and 30% respectively. Based upon the above studies, it has been concluded that the prevalence of PTSD ranges between 1% and nearly 3%. Rates among at risk populations, such as Vietnam war veterans, tend to be much higher but less consistent across studies.

Recent studies, however, have indicated that prevalence rates among the general population have gone up. An epidemiological survey by Breslau et al. (1991) for example, interviewed 1007 randomly selected young adults from the Detroit Michigan area using the National Institute of Mental Health Diagnostic Interview Schedule. Accordingly, they found that 397 out of the 1007 participants (39.1%) had been exposed to one or more traumatic events in their lifetime. And 93 of these individuals (23.6%) met DSM-III-R diagnostic criteria for PTSD. Thus, for the total sample the lifetime prevalence rate of PTSD was 9.2 %. Compared to results of a community study looking at the prevalence of mental disorders in the United States (Reiger et al., 1988), this 9.2% prevalence rate reported by Breslau et al. (1991) suggests that PTSD occurs more frequently than depression (8.3%) and drug abuse (5.9%) (cited in Solomon, Gerrity, & Alyson, 1992). Norris (1992) interviewed non-patients as well and reported an even higher rate of traumatic exposure (69%). Yet Norris reported a similarly high rate of DSM-III-R PTSD (7%) among those exposed. Thus, these two current studies suggest that the rate of PTSD may be higher than earlier studies indicate.
In the past several years, PTSD has gained clinical and media popularity. The increased popularity has stemmed in part from the controversy surrounding the disorder. It has been argued that PTSD is not a valid diagnosis because of the difficulty in distinguishing an abnormal versus a normal response to a traumatic event (Robins, 1990). There has also been debate over how to classify PTSD since some believe PTSD is really a form of malingering or another psychopathological disorder such as a personality or dissociative disorder (Davidson & Foa, 1991). Soloman et al. (1991) conducted a study to examine whether or not PTSD is a separate diagnostic entity. These researchers administered the SCL-90 to twenty-two Israeli Lebanon war veterans diagnosed with PTSD who were seeking psychiatric services and thirty-eight psychiatric out-patients (all subjects were male). The goal was to determine if PTSD could be identified and discriminated separately from other diagnoses of anxiety, depression and obsessive-compulsive disorder. Data analysis indicated that while there was some overlap between PTSD and obsessive compulsive disorder, the SCL-90 could indeed identify and discriminate between clinical groups. Thus, Soloman et al. concluded that PTSD is a independent psychiatric condition characterized by a unique set of symptoms. In addition, several theoretical papers address PTSD validity issues and summarize the evidence for PTSD's construct validity and legitimacy (Davidson & Foa, 1991; Foa et al., 1989; Keane, 1989; Keane, Wolfe, & Taylor, 1987; March, 1990). Overall, throughout the course of researching PTSD, findings have supported the validity and uniqueness of this disorder and thus, added to the credibility of PTSD as a bona fide psychological disorder.

Etiological Models

While PTSD is now accepted as a valid anxiety disorder, there is still healthy debate over the etiology of PTSD. Several explanations of how PTSD develops have
been offered across the different paradigms of psychology. While each school of thought has its own viewpoint, no single etiological model can completely explain the development of PTSD. At the present time there are some promising models, but the question of why some people exposed to traumatic stress develop PTSD while others do not is still left unanswered. Those models dominating the literature today, behavioral, biological, psychodynamic, and cognitive/information processing will briefly be reviewed. For a more thorough review on this topic see Jones & Barlow (1990) and Foa et al. (1989).

**Behavioral**

Several researchers in the area of PTSD have turned to behavioral models to help conceptualize the etiology of this disorder (see Foa et al., 1989; Jones & Barlow, 1990). Primarily, behavioral models of PTSD rely on Mowrer's (1960) two-factor theory of learning (i.e. classical and instrumental learning). According to the behavioral model, the fear and anxiety symptoms of PTSD are acquired through a classical conditioning process (Foa et al., 1989; Jones & Barlow, 1990). In light of this process, the traumatic stressor is viewed as the unconditioned stimuli because it innately elicits fear and anxiety. Therefore, at the time of exposure to the traumatic stressor, other neutral stimuli that are also present become associated with the traumatic stressor, or unconditioned stimuli. Thus, through a conditioning process the neutral stimuli acquire the same aversive properties of the traumatic stressor, or unconditioned stimuli, and gain the power to evoke similar fear and anxiety responses (i.e. neutral stimuli become conditioned stimuli).

In addition, behavioral models rely on the theory of instrumental learning to explain the avoidance behavior typical of PTSD (Foa et al., 1989; Jones & Barlow, 1990). In short, they propose that avoidance responses occur in high frequency in
order to evade or reduce confrontation with conditioned stimuli (i.e. those stimuli that
by association to the trauma now evoke fear and anxiety). This process, if successful,
will reduce anxiety and evoke similar avoidance behavior in the future when confronted
with aversive conditioned stimuli (i.e. negative reinforcement). Researchers who
adhere to behavioral models also refer to higher order conditioning and stimulus
generalization as mechanisms for increasing the number of stimuli that evoke aversive
reactions (Foa et al., 1989; Jones & Barlow, 1990). Therefore, over time the number
of stimuli capable of triggering PTSD symptomatology (i.e. reexperiencing, avoidance,
hyperarousal) increases due to higher order conditioning and stimulus generalization.
Thus, higher order conditioning and stimulus generalization help explain the persuasive
and unpredictable nature of PTSD.

The behavioral etiological model of PTSD is not without criticism however.
Perhaps the most cited criticism is the question of why PTSD persists despite continual
exposure to the trauma via confrontation with conditioned stimuli, reoccurring
thoughts, reoccurring dreams, etc. Keane, Zimmerling, & Caddell (1985) suggest that
these forms of exposure are not successful in permanently reducing anxiety because
they are incomplete exposures (cited in Foa et al., 1989). That is they do not include all
of the conditioned stimuli associated with the traumatic stressor. Jones & Barlow
(1990) suggest that the avoidance behavior, so frequently seen in individuals with
PTSD, further makes this exposure incomplete. Other explanations are that these
exposures are too short in duration and do not match the mood state of the original
traumatic experience (Foa et al., 1989).

Biological

Another well researched etiological model of PTSD is the biological. The
biological model attempts to explain PTSD, a psychological response to trauma, by
examining the biological changes that underlie the traumatic experience. To summarize the biological model, it postulates that exposure to a traumatic event lends itself to neurochemical activity; resulting in changes in neurotransmitter levels. More specifically, symptoms of PTSD has been linked to noradrenergic receptor hypersensitivity and endogenous opioid system activity (i.e. production of CNS opioid peptides). These neurotransmitter changes are chronic and upon re-exposure to traumatic stressors or stimuli, mediate behavioral changes. Thus, the common behaviors symptomatic of PTSD (i.e. startle responses, recollections, nightmares) are not directly caused by the traumatic event, but by the biological changes that occur as a result of the trauma. Vanderkolk & Saporata (1991) suggest that the highly consistent pattern of symptoms observed in humans exposed to different traumatic stressors is evidence that PTSD symptomatology is biologically based.

Furthermore, advocates of the biological model turn to animal studies of inescapable shock to support their hypotheses, suggesting that the human PTSD response parallels that found in animals who have been exposed to inescapable or unavoidable shock (Vanderkolk, Boyd, Krystal, & Greenberg, 1984 cited in Jones & Barlow, 1990; Vanderkolk, 1988; Vanderkolk & Greenberg, 1987). It is hypothesized that when animals are exposed to inescapable shock there is a depletion of neurotransmitters, namely catecholamines (i.e. norepinephrine and dopamine) (Vanderkolk & Greenberg, 1987). Vanderkolk & Greenberg assume that this depletion of catecholamines occurs because use exceeds synthesis during unavoidable shock experiences. They further propose that this depletion becomes a conditioned response resulting in chronic noradrenergic hypersensitivity. Thus, during future exposure to threat, these same animals are hypersensitive to norepinephrine stimulation.

It is believed that a similar process occurs in humans exposed to overwhelming trauma. As evidence, Vanderkolk & Greenberg (1987) point out that the negative
symptoms of PTSD in humans such as decreased motivation, decline in occupational functioning, and emotional detachment resemble animal reactions to catecholamine depletion. In addition, they suggest that the hyperarousal (i.e. startle responses, explosive outbursts, difficulty falling asleep) seen in individuals with PTSD is analogous to the chronic noradrenergic hypersensitivity observed in animals following catecholamine depletion.

Further support for the biological model of PTSD also stems from an animal-human analogy. Animal studies of inescapable shock show that subsequent exposure to mild shock results in a conditioned endogenous opiod response (Jones & Barlow, 1990; Vanderkolk, 1988; Vanderkolk & Greenberg, 1987). This endogenous opiod response provides an analgesic, or pain-relieving, reaction similar to that provided by exogenous opioids. Vanderkolk (1988) indicates that this same process occurs in humans suffering from PTSD (i.e. numbing symptomatology). He cites unpublished data that demonstrated that Vietnam veterans who watched a film depicting Vietnam combat had an analgesic response equivalent to a 8 milligram injection of morphine. Thus, the biological etiological model of PTSD relies heavily on comparisons between similar biochemical and behavioral changes in animals exposed to inescapable shock and humans exposed to traumatic events.

Although the biological theory of PTSD is dominated by Vanderkolk's work, Kolb (1987) offers another biologically based hypothesis on the etiology of PTSD (cited in Jones & Barlow, 1990; Foy, Osato, Houskamp, & Neumann, 1992; Pitman, 1993). Kolb's conceptualization of PTSD differs from Vanderkolk's in that he suggests that exposure to a traumatic event leads to changes in neuronal pathways. He speculates that the emotional response to trauma causes excessive stimulation of cortical neural networks, namely synaptic processes, in the limbic system. This increased synaptic activity leads to fatigue and impairment in synaptic processes, which further
results in neurochemistry changes. According to Kolb, PTSD symptoms are mediated by these changes in neurochemical activity.

While Kolb and Vanderkolk have slightly different perspectives on the biological cause of PTSD, both agree that PTSD is the sequela of an interaction between biological and psychological events. Therefore, the biological model acknowledges that prior life experiences, such as a history of a traumatic event(s), can be a predisposing factor for developing psychological problems in reaction to later traumatic stressors (Jones & Barlow, 1990). Thus, according to the biological model, changes in neurochemistry associated with an earlier life trauma may predispose an individual to respond to future traumatic stressors with greater risk for PTSD.

As with the behavioral etiological model, the biological model also is suspect to criticism. Jones & Barlow (1990) provide a comprehensive review of these criticisms. Despite criticism, the biological model has provided valuable information that helps to better understand the complex etiology of PTSD.

Cognitive/ Information Processing

Another conceptual model that attempts to explain the existence of PTSD is the cognitive/ information processing model. Researchers who propose cognitive/ information processing models have basically extrapolated on Lang's (1979) theory of fear structures (cited in Foa et al., 1989 and Jones & Barlow, 1990). The gist of this model is that human beings have preexisting mental schemata about fear that develop out of past experiences and beliefs about the future (Jone & Barlow, 1990). Thus, dangerous stimuli are cues for threat and activate this fear structure. When an individual is exposed to a traumatic event outside the range of normal experience, a new memory network is formed that violates previously held assumptions that the world is a safe place. PTSD is thought to develop when this new memory network consisting of
information on the traumatic stimuli, responses (i.e. cognitive, affective, physiological, and behavioral), and interpretations (of the event) remains in "active memory" (Creamer, 1993). Until the memory network is activated and corrective information is processed, PTSD symptoms continue (Foa et al., 1989).

The cognitive/information processing model also relies on the concept of cognitive appraisal to explain PTSD (Foa et al., 1989). Cognitive appraisal has to due with how people attach meaning to events in their lives. Foa et al. (1989) review a large body of literature that suggests that animals and humans both prefer predictable and controllable events (versus unpredictable and uncontrollable). When animals are exposed to uncontrollable or unpredictable events their responses are similar to those found in PTSD (i.e. sudden outbursts of anger, aggressive behavior, attempts to escape, agitation, lethargy, passivity, and withdrawal) (Mineka & Kihlstrom, 1978 cited in Foa et al., 1989). Foa et al. propose that when individuals attribute the occurrence of a traumatic event to personal failure in controlling or predicting the situation, guilt becomes a factor in the development of PTSD. They hypothesis that feelings of guilt can magnify a PTSD reaction. Creamer (1993) agrees that formulation of a memory network regarding the traumatic event can cause psychological distress when it is opposes a preexisting belief that the person is a competent being.

The fact that the cognitive/information processing model includes the variables of predictability and controllability is cited as a strength of the model (Jones & Barlow, 1990). Like other etiological models, however, it's weaknesses have been addressed in the literature (Foa et al., 1989; Jones & Barlow, 1990). For example, this model fails to discuss important variables such as social support or coping responses. It also does not account for the numbing symptoms of PTSD or delayed PTSD responses. Despite criticism, the cognitive/information processing model has added to the overall
understanding of PTSD by attempting to explain its etiology from a cognitive perspective.

**Psychodynamic**

The psychodynamic model of PTSD typically includes components of the cognitive/information processing model. Horowitz (1986) proposed that PTSD develops when an individual faced with a traumatic stressor is unable to successfully integrate it into their preexisting cognitive schema (cited in Jones & Barlow, 1990). When this occurs, Horowitz suggests that recollections of the traumatic event persist in active memory and disrupt the individual's coping mechanisms. Normally an inhibitory process will take place and the traumatic memory is eventually integrated into the existing cognitive schema. If this inhibitory process fails, however, the intrusive reexperiencing symptoms of PTSD emerge (i.e. flashbacks, nightmares, etc.) On the other hand, if the inhibitory process is too strong then the avoidance symptoms of PTSD develop (i.e. sleep disturbances, diminished affect, avoidance of thoughts/feelings associated with trauma, etc.). This model suggests that the avoidance features of PTSD provide a defense against the anxiety brought on by the intrusive features. When the defense of denial breaks down or is ineffective, the intrusive symptoms dominate. In short, this is the rationale for observing both intrusive and avoidant symptoms in PTSD sufferers.

As with the other three etiological models described above, the psychodynamic model also has weaknesses. It fails to include the impact of individual perceptions of control and coping mechanisms on the development of PTSD (Jones & Barlow, 1990). Jones & Barlow also highlight that this model lacks adequate explanation for why some individuals have difficulty integrating the traumatic event into their cognitive schemas, while others do not. While behavioral, biological, and cognitive/information
processing models appear to dominate the PTSD research and treatment literature more so than the psychodynamic model, the psychodynamic model offers an additional explanation for the etiology of PTSD.

Besides these etiological models, researchers have also proposed that additional variables may play into the development of PTSD. One highly documented variable correlated to PTSD is number of traumatic stressors. Data suggest that those exposed to multiple traumas are at greater risk for pathology; thus, the number of traumatic events experienced needs to be assessed when working with clinical populations (Foa et al., 1989; Jones & Barlow, 1990; Martin, McKean, & Veltkamp, 1986; Sutker et al., 1991; Vrana & Lauterbauch, 1994). Research has also indicated that the nature, duration, and severity of a trauma can affect whether or not PTSD develops (Davidson & Foa, 1991; Foa et al., 1989; Jones & Barlow, 1990; Sutker et al., 1991).

Interpersonal variables such as premorbid history, pre-trauma coping skills, and social support have also been shown to be associated with PTSD morbidity (Jones & Barlow, 1990; Vanderkolk, 1988; Vanderkolk, Brown, & VanderHart, 1989). Clearly, there are many factors that may contribute to the development of PTSD. Unfortunately, our knowledge of theses variables is only correlational and not causal.

In summary, several etiological models have been proposed in the PTSD literature. To date, no single model sufficiently accounts for the occurrence of PTSD. While each formulates important ideas to help understand PTSD, it is still unclear why some individuals faced with an overwhelming traumatic event develop PTSD, while others avoid such a response. It is likely that a combination of models, especially the behavioral, biological, and cognitive/ information processing best explains this complex disorder.
Treatments

Treatments for PTSD are also varied. Soloman et al. (1992) reviewed the treatment literature in order to critique the empirical evidence for the efficacy of PTSD interventions. Their review was quite surprising in that out of 255 articles on PTSD treatments, only 11 met Soloman et al.’s review article inclusionary criteria. The criteria were that studies had to be randomized, clinical trials with systematic assessment of PTSD based on DSM-III or DSM-III-R criteria. Soloman et al. critiqued the treatment efficacy studies on methodological strength, sample selection, and statistical tests of significance.

After reviewing the 11 studies, Soloman et al. (1992) reported that pharmacotherapy, which treats the anxiety symptoms present in PTSD via psychotropic medications, has only modest efficacy. Yet, it can have a meaningful effect when used as an aid to individual therapy. The basis for treating PTSD individuals with medication stems from the belief that trauma is a psychobiological event. According to the biological etiological model, PTSD is the result of long term neurochemical changes. Therefore, the disorder should be treatable by drugs that affect brain neurochemistry (Soloman et al., 1992). However, the results of pharmacotherapy (i.e. antidepressants and antipanic medications) studies have been mixed. Of the 5 controlled drug studies reviewed by Soloman et al., 3 were found to have no significant effects at decreasing PTSD symptomatology, 1 had modest effects for decreasing avoidance symptoms only, and the last had modest effects for decreasing only intrusive symptoms. Other problems noted with drug therapy are that it requires dietary restrictions and drug and alcohol abstinence, and poses a risk for addiction, dependency and withdrawal symptoms. Comorbidity also makes treating PTSD with
medication difficult, because the presence of other psychological problems may complicate medication selection and efficacy (Soloman et al., 1992).

Individual psychotherapy is another common method for treating PTSD. While there are several different forms of individual therapy available for PTSD sufferers, the current trend in treatment has been cognitive-behavioral therapeutic techniques. According to the cognitive/information processing paradigm, PTSD clients must activate their traumatic memory network and then be exposed to (and process) information that is inconsistent with the traumatic memory network in order to recover (Creamer, 1993). This is typically accomplished with a traditional behavioral technique called exposure. Exposure therapy is a treatment that reduces anxiety by having the client confront feared stimuli either through repeated imagery (i.e. systematic desensitization) or extended in vivo experience (i.e. flooding) (Foa & Rothbaum, 1989; Soloman et al., 1992). Systematic desensitization studies have been found to be highly effective in reducing PTSD symptoms (Foa & Rothbaum, 1989; Soloman et al., 1992). Flooding has also been shown to have positive effects at decreasing PTSD symptomatology (Foa & Rothbaum, 1989), but it primarily reduces intrusive symptoms while having little effect on avoidance and numbing symptoms (Soloman et al., 1992). As with drug therapy, flooding has some complications. It has been linked with increased depression, alcohol relapse and panic disorder. It has been suggested that comorbidity may be the mediating factor in the occurrence of these complications (Soloman et al., 1992).

Aside from exposure-based techniques, cognitive-behavioral therapy also utilizes skills training to help individual with PTSD learn how to manage anxiety and fear. Stress inoculation training (SIT) is the most common anxiety management strategy to appear in the treatment literature. SIT usually includes multiple techniques like muscle relaxation, thought stopping, breathing control, communication skills,
cognitive restructuring, and stress inoculation (Foa & Rothbaum, 1989; Soloman et al., 1992). While studies have found SIT to have beneficial effects in reducing PTSD symptoms, it does not appear to be superior to exposure-based treatments (Foa & Rothbaum, 1989; Soloman et al., 1992).

In addition, eye movement desensitization and reprocessing (EMDR) is a relatively new cognitive-behavioral approach for treating PTSD. The technique requires patients to recall traumatic memories while engaging in rhythmic eye movements; which are brought about by following the hand movements of a therapist. Although EMDR was only introduced as a therapeutic technique a few years ago (Shapiro, 1989a), it has quickly gained popularity due to its high success rate in alleviating PTSD symptomatology in a very brief period of time (Shapiro, 1989b). Empirical studies examining the efficacy of this new treatment are just beginning to surface. To date, there is only speculation about the critical elements of EMDR which allow for it to be an effective short term intervention for PTSD. While more research is needed, EMDR seems to be a promising treatment for a wide range of PTSD traumas.

Psychodynamic therapy is also used in the treatment of PTSD. The basis of this type of therapy is to incorporate the traumatic event, in a meaningful way, into one's understanding of life, self-concept, and world image (Soloman et al., 1992). This is typically done with talk therapy or hypnotherapy. In their literature review of treatments for PTSD, Soloman et al. (1992) reported that psychodynamic therapy and hypnotherapy show some promise as clinical treatments for PTSD, but are not superior to cognitive-behavioral approaches. While psychodynamic therapy seems to have more of an effect on reducing avoidance symptoms, hypnotherapy tends to reduce intrusive symptoms more so.

In short, there are numerous ways to treat PTSD. Research to date, however, suggests that cognitive-behavioral interventions such as exposure-based techniques and
EMDR are the most effective in alleviating PTSD symptomatology. While other interventions have shown some merit, the current trend in clinical treatment is cognitive-behavioral therapy.

Despite the uncertainty surrounding the exact cause of PTSD, the psychological and physical risks associated with PTSD are generally more agreed upon in the literature. One psychological risk for those diagnosed with PTSD is chronicity. The DSM-IV classifies PTSD as chronic when the duration of symptoms is three months or longer. While there are a substantial number of studies reporting high rates of chronicity among PTSD samples, a limitation of these studies is that they typically include war veterans. There are only a few studies that examine other subject populations (i.e. community, rape victims, police officers, dam collapse). These studies on non-veterans are significant because they demonstrate that chronicity is related to all types of traumatic stressors.

In Green, Grace, Lindy, Glaser, & Leonard (1990), 191 Vietnam veterans from the community were interviewed using the SADS-L to make lifetime and current diagnoses of PTSD (cited in Green, Lindy, Grace, & Leonard, 1992). At the time of the interviews, 29% of the subjects met a current diagnosis of PTSD and therefore were classified as chronic cases. Similar chronicity rates were reported by Engdahl, Speed, Eberly, & Schwartz (1991), however their subjects were POW’s from W.W.II (N=62). Forty years post captivity, 29% of the subjects (n=18) continued to show chronic PTSD. Even higher rates of chronicity were indicated in Mellman, Randolph, Brauman-Mintzer, Flores & Milanes (1992). These researchers conducted structured assessments with 60 war veteran (i.e. Vietnam, W.W.II, Korean) outpatients using the SCID. Although 45% of the sample (n=27) reported that PTSD symptomatology diminished in the first year or two after combat, 55% (n=33) had persistent and recurrent symptoms (i.e. diagnosed as chronic). Furthermore, Roszell, McFall, &
Malas (1991) completed psychological evaluations on 116 Vietnam veterans referred to a PTSD clinic. Nearly 88% (n=102) were diagnosed with current and chronic PTSD. Thus, the literature suggests that for a significant portion of war veterans PTSD is a chronic disorder that has lasting affects on daily living.

Signs of chronicity have been discovered in other populations besides war veterans as well. For example, Gersons (1989) examined the psychological consequences of being involved in a shooting incident for 37 police officers in Amsterdam. Gersons found that 19% of the officers (n=7) met a current diagnosis of PTSD at the time of interview and thus, were labeled as chronic cases. The lasting effects of PTSD have also been documented among survivors of a 1972 dam collapse (Green et al., 1992). Green et al. interviewed 193 survivors of the dam collapse and reported that 14 years post-trauma, 25% of the survivors met a chronic PTSD diagnosis. In addition, the risk for chronicity was noted by Rothbaum, Foa, Riggs, Murdock, & Walsh (1992) in their examination of PTSD among survivors of rape. These researchers reported that 34 out of 94 subjects met criteria for PTSD shortly after being raped. At a three month follow-up, 47% of these PTSD positive subjects continued to met diagnostic criteria. Rothbaum et al.'s findings suggest that if rape victims did not show signs of improvement within the first month after the rape, there was a high risk for chronic PTSD symptomatology. An epidemiological study of PTSD reported similar chronicity statistics (Davidson et al., 1991). In a community survey of 2,985 people, Davidson et al. found that 46% of the PTSD cases were chronic. These studies are important because they illustrate that the risk for chronicity is not limited to war veterans. Rather, it appears that a wide range of traumatic stressors have been linked to long term PTSD symptomatology. This finding is significant not only because it means people are suffering from this disorder for long periods of time, but also because research has suggested that chronic PTSD is
associated with higher rates of psychological and medical comorbidity, less social support, more avoidance symptoms, and higher rates of suicide (Davidson, Kudler, Saunders, & Smith, 1990).

**PTSD and Psychological Comorbidity**

Actually, PTSD is associated with an increase risk for psychological and physical comorbidity regardless of chronicity. Research has shown quite consistently that individuals with a lifetime occurrence of PTSD usually have other DSM diagnoses as well. However, this research is limited by the fact that no casual direction is yet known. In other words, it is not yet understood if individuals with preexisting mental health problems are more likely to develop PTSD or if PTSD predisposes one to develop other psychological problems. While answers on a cause and effect relationship still await further research, the PTSD literature does suggest that psychological comorbidity occurs frequently among individuals with PTSD. The studies in this area consist of three main types of subject populations, clinical samples (individuals seeking treatment), war veteran surveys, and community surveys (non-treatment individuals) (Keane & Wolfe, 1990).

Keane & Wolfe (1990) provide a detailed review article on the topic of PTSD and comorbidity. In their review they list four clinical studies that have reported high rates of comorbidity among PTSD patients. Sierles, Chen, McFarland & Taylor (1983) assessed 25 PTSD inpatients from a VA center (cited in Keane & Wolfe, 1990). Their subjects had all been diagnosed with PTSD based on DSM-III criteria. Assessment revealed an 84% comorbidity rate among the subjects. The most prevalent coexisting conditions were history of depression (72%), alcoholism (64%), and antisocial personality disorder (48%). A weakness of this study, however, is that it did not include a control group. A later study by Sierles, Chen, Messing, Besyner, & Taylor...
(1986) replicated the 1983 study but used outpatients instead of inpatients (cited in Keane & Wolfe, 1990). Using the same number of subjects (N=25), Sierles et al. (1986) reported results similar to the earlier study. They found an 84% comorbidity rate among the subjects as well, with depression (84%), alcoholism (76%) and antisocial personality disorder (64%) again being the three most prevalent coexisting conditions. However, this later study (compared to the 1983 study) found higher rates of all three conditions among subjects. Unfortunately, no comparison group was included in this replication study either.

Other clinical studies assessing war veterans with PTSD have found similar high rates of comorbidity. Using the DIS, Escobar, Randolph, Puente, Spiwak, Asamen, Hill & Hough (1983) evaluated psychological comorbidity among 20 Hispanic veterans (outpatients) diagnosed with PTSD (cited in Keane & Wolfe, 1990). They reported that on average, subjects had 3.5 additional DSM-III Axis I diagnoses. The top five comorbid conditions were alcohol dependence (65%), social phobia (50%), drug dependence (40%), major depression (35%), and schizophrenia (35%). Rozell et al. (1991) examined concurrent psychiatric disorders in 48 Vietnam veterans with current diagnoses of PTSD. Results of the SCID-P indicated that among the 48 subjects, only three (6.3%) had solely PTSD. Therefore, 9 subjects (18.8%) met criteria for at least one other current diagnosis, 15 subjects (31.3%) had two additional diagnoses, and 21 subjects (43.7%) met criteria for three or more additional current diagnoses. In all, the mean number of current Axis I diagnoses co-occurring with PTSD for this group was 2.44. The most prevalent comorbid conditions in this study were major depression (65%), alcohol abuse (33%), social phobia (25%), and generalized anxiety disorder (25%). Boudewyns, Albrecht, Talbert & Hyer’s (1991) results further support the notion that psychiatric comorbidity is prevalent among inpatient war veterans with PTSD. Boudewyns et al. employed the C-DIS-R to
determine if subjects (N=102) had any DSM-III Axis I co-diagnoses. As it turned out, all subjects had at least one additional Axis I diagnosis. In this sample, alcohol abuse or dependence (82.4%) and drug abuse or dependence (55.9%) were the two most frequent lifetime co-diagnoses among subjects. Major depression (34.3%), bipolar disorder without psychotic features (28.4%), and schizophrenia (28.4%) were also common co-diagnoses with PTSD.

High rates of substance abuse comorbidity (alcohol and/or drugs) seem to be a common finding among clinical studies within the PTSD literature. In addition to the studies listed above, Keane, Gerardi, Lyons, & Wolfe (1988) reported that of 25 veterans seeking treatment for PTSD, 80% met criteria for some form of substance abuse or dependence; based on an assessment using the SCID (cited in Keane & Wolfe, 1990). More recently, Keane & Wolfe (1990) have also found high rates of substance abuse concurrent with PTSD among war veterans. Keane & Wolfe randomly selected 50 subjects with PTSD (both inpatients and outpatients) from a PTSD center. Also using the SCID, these two researchers found that 84% of their subjects had at least one form of substance abuse. More specifically, 70% met criteria for alcohol abuse and/or dependence, while 42% met drug abuse and/or dependence criteria. In addition, 68% of subjects had a lifetime diagnosis of depression, 34% had dysthymia, and 26% personality disorders of some kind. Overall, the subjects in the Kean & Wolfe study had an average of 2.8 additional diagnoses (i.e. in addition to PTSD).

Even when comorbidity studies are extended to war veterans in the community who are not seeking treatment for PTSD, high rates of concurrent psychiatric disorders are found. One example of this is the Center for Disease Control's Vietnam Experience Study (1988) which used the DIS to evaluate the psychosocial characteristics of 2,490 Vietnam veterans and 1,972 Vietnam-era veterans (controls) (cited in Keane & Wolfe, 1990). The CDC reported that among the Vietnam veterans, 15% met a lifetime
diagnosis of PTSD. However, 2.2% of these subjects met a current diagnosis of PTSD (i.e. had symptoms within one month of the interview). Among the 2.2% with current PTSD symptomatology, 66% met DIS criteria for either an anxiety or depressive disorder and 39% met alcohol abuse or dependence criteria.

Another study to include veterans from the community versus treatment centers is Kulka et al. (1988 cited in Keane & Wolfe, 1990). These researchers interviewed 3,016 Vietnam veterans, Vietnam-era veterans, and civilian controls using multiple measures to determine PTSD prevalence and the SCID to assess comorbidity among PTSD positive veterans. Results indicated that among veterans with current PTSD, 98.9% met criteria for lifetime comorbidity (i.e. had another disorder previously in their lives). Even more surprising was the finding that 50% (of veterans with current diagnosis of PTSD) met criteria for another disorder within the past six months of the interview. Like other researchers, Kulka et al. found that alcohol abuse or dependence (73% of subjects met lifetime diagnosis), antisocial personality disorder (31% of subjects met lifetime diagnosis), major depression (26% of subjects met lifetime diagnosis) and dysthymia (21% of subjects met lifetime diagnosis) were common co-occurring disorders among veterans with PTSD. Thus, it appears that there is an association between PTSD and high comorbidity rates for community samples of PTSD veterans as well as clinical samples (Davidson & Foa, 1991; Keane & Wolfe, 1990).

Although the majority of studies supporting the notion that PTSD is associated with a risk for psychological comorbidity have included war veteran samples, there are also a handful of studies on noncombat related PTSD that also suggest this association exists. The large scale epidemiologic survey by Helzer et al. (1987) randomly surveyed citizens in the St. Louis area (N=2,493) and found that individuals with PTSD were two times as likely to have other psychological problems versus those without PTSD. Data analysis in the Helzer et al. study revealed that subjects with
PTSD were at greatest risk for obsessive-compulsive disorder, dysthymia, major depression, or mania. A more recent epidemiological survey, which included 2,985 individuals from North Carolina, reported even higher probabilities of comorbidity amongst individuals with PTSD (Davidson et al., 1991). Results of this community survey indicated that, overall, subjects who met criteria for PTSD were 9.3 times more likely to have another DSM-III diagnosis (assessed by the DIS) than individuals without PTSD. More specifically, these PTSD positive subjects' chance of having somatization disorder, schizophrenia or schizophreniform disorder, or panic disorder was 20 times greater than those without PTSD. Furthermore, PTSD positive subjects were also 10 times more likely to met criteria for social phobia, obsessive-compulsive disorder, generalized anxiety disorder, or major depression. The only finding from this study that is inconsistent with previous research is that PTSD positive subjects did not have significantly higher rates of dysthymia, alcohol abuse or dependence, or mania. On the whole, however, these two population surveys are consistent with results from clinical and community war veteran studies.

So far the literature on comorbidity rates among specific trauma populations other than war veterans is limited. Yet the two studies that utilize alternative trauma populations have also indicated that PTSD is correlated with high rates of psychiatric comorbidity. Kilpatrick et al. (1987; cited in Keane & Wolfe, 1990) researched a group of crime victims and assessed comorbidity using the DIS. The most frequent concurrent problems among subjects with a current diagnosis of PTSD were sexual dysfunction (41%), major depression (32%), obsessive-compulsive disorder (27%), and phobias (18%). Smith, et al. (1990) used the DIS to interview hotel employees who survived a plane crash into the hotel. Of those employees on-site at the time of the crash (n=17), 5 (29%) met diagnostic criteria for PTSD. Of these 5 employees, 12% also met a diagnosis of alcohol abuse/ dependence (n=2), 24% depression (n=4), and
18% generalized anxiety disorder (n=3). Comorbidity data has also been reported on a group of individuals involved in a dam collapse (N=193) (Green et al., 1992). Among those subjects who met a current diagnosis of PTSD (i.e. 25% of subjects) 42% also met diagnostic criteria for major depression, 42% met criteria for generalized anxiety disorder, and 29% met criteria for simple phobia. While Green et al found similar rates and types of comorbid conditions in dam collapse victims as others have found among war veterans, they did find lower rates of dysthymia, substance abuse, and antisocial personality disorder. The authors address possible reasons for these differences in their discussion section (p. 764-765).

In short, the PTSD literature suggests that despite differences in samples (i.e. veterans seeking treatment, veterans in the community, general population, crime victims, plane crash disaster survivors, or dam collapse victims), methodology, and assessment measures, PTSD is associated with a significant risk for psychological comorbidity. Even though the order of causation is not yet known, research indicates that there is a likelihood for individuals with PTSD to encounter multiple psychological problems. Further research including a wider range of traumatized individuals would be helpful, however, since the current literature has predominantly evaluated consequences of combat stress.

Psychological Comorbidity and Treatment Issues

It is likely that standard treatment for any psychological disorder will be complicated when comorbidity plays into the clinical picture. With respect to treatment therefore, the high rate of comorbidity associated with PTSD is deserving of additional attention. In fact, Boudewyns et al. (1991) suggests that psychological comorbidity is an important factor to be considered in predicting treatment outcome. Unfortunately, little empirical research has focused on comorbidity of DSM Axis II Personality
Disorders. One of the few studies to examine this issue was Engdahl et al. (1991), which utilized the MMPI to assess 62 POW’s with PTSD for personality disorders. Results of this study indicated that PTSD was found to be significantly associated with hypochondriasis, depression, and psychasthenia.

Southwick, Yehuda, & Giller (1993) are the first researchers to empirically study Axis II comorbidity via a standardized diagnostic clinical interview, using the Personality Disorder Examination. Their subjects were 34 combat veterans seeking treatment for PTSD, subdivided according to whether treatment was inpatient (n=18) or outpatient (n=16). High rates of Personality Disorders were found in both groups; especially borderline, obsessive-compulsive, avoidant, and paranoid personality disorders. However, the inpatients were significantly more likely to meet diagnostic criteria for paranoid, schizotypal, avoidant and self-defeating personality disorders. These results are consistent with other studies that utilized self-report measures to assess prevalence of personality disorders among combat veterans with PTSD (see Southwick, Yehuda, & Giller, 1993).

With respect to combat veterans with PTSD, Southwick, Yehuda, & Giller (1993) propose that impairments in personality styles may impact treatment efficacy. Thus, they suggest it may be necessary to select specific interventions that will take into account Axis II comorbidity. Others in the field have also noted that comorbidity, especially Axis II disorders, could have a critical influence on the course of PTSD including the treatment phase. For example, Horowitz, Wilner, Kaltreider, & Alvarez (1980) suggested that traumatized individuals who also have Personality Disorders may experience a more severe course of PTSD than those without accompanying Personality Disorders. Southwick, Yehuda, & Giller (1993) also cite Reich (1990) who proposed that Axis II comorbidity may influence pharmacological treatment among PTSD patients, making long-term outpatient treatment aimed at character psychopathology
necessary as well. Since the number of empirical studies in this area are limited and only combat veterans seeking treatment have been examined, generalizations to other trauma populations can not be made. Furthermore, it is still not clear whether the onset of PTSD causes pathological changes in personality or if pre-trauma personality disorders predisposes one to later develop PTSD when exposed to a traumatic experience. Due to the potential affect on disorder course and treatment efficacy, comorbidity should be assessed in other trauma populations in order to determine if findings from combat veteran studies generalize to these others groups.

**PTSD and Physical Health Comorbidity**

Besides the risks for chronicity and psychiatric comorbidity, PTSD also appears to be correlated with physical health morbidity. It has commonly been reported that individuals with PTSD complain of somatic problems (Davidson et al., 1991; Litz, Keane, Fisher, Monoco, 1992, Shalev, Bleich, Uranso, 1990; Sutker et al., 1991). Sutker et al. (1991) provide a literature review on PTSD and somatic complaints. They indicate that the common findings are increased self-reports of fatigue, headache, gastrointestinal distress, respiration problems, hearing and vision impairments/losses, and chronic pain among a range of traumatized individuals with PTSD (i.e. rape victims and military air disaster, political confinement, mass violence, torture, and POW survivors). Soloman & Mikulincer (1987) examined the relationship between somatic complaints and PTSD symptoms in a controlled study comparing Israeli combat veterans with and without PTSD and non-combat veterans. Using a self-report health questionnaire that inquired about allergy, hypertension, ulcer, digestive problems, heart disease, chest pains, diabetes, back pain, medication, alcohol, tobacco, and drug use, Soloman & Mikulincer found that PTSD-positive subjects endorsed complaints of back pain, digestive problems and chest pain significantly more than non-PTSD subjects.
However, PTSD-positive subjects also reported significantly higher rates of alcohol and cigarette use. A two-year follow-up of this study revealed that when controlling for time, back and chest pain was still significantly correlated with the presence of PTSD (Soloman, Mikulincer & Kotler, 1987). As in the original study, however, PTSD-positive subjects continued to have significantly higher rates of alcohol and nicotine use. While results of these studies may be explained by various intervening variables and no causal relationship can be derived from the findings, they are a starting point for better understanding the possible physical health consequences of PTSD.

Another group of researchers also attempted to better understand somatic distress following trauma exposure (Shalev et al., 1990). The study included 50 combat veterans with PTSD and 48 without PTSD, matched on age and sex. Subjects completed a 340 item, self-report medical questionnaire. Results of the study were mixed. While PTSD positive subjects reported significantly more negative health symptoms (i.e. weight loss, cardiovascular, neurological, gastrointestinal, audiological, headaches, and low back pain) physical exams and lab tests showed very few differences between the two groups of subjects. Interestingly, PTSD and controls had similar blood pressure and heart rate measures; yet PTSD subjects had significantly lower effort tolerance scores on a stress test compared to controls. Even when alcohol and cigarette use was controlled because PTSD subjects had significantly more adverse health practices, PTSD subjects' effort tolerance on a stress test was significantly lower than controls. The mixed results from this study suggest that caution should be taken when interpreting self-report health measures, but also indicates that PTSD may be linked with high rates of adverse health practices that may mediate somatic problems.

In addition, Blanchard (1990) suggests that one physical consequence of PTSD may be hypertension. However, his hypothesis is only based on a literature review of psychophysiological responding in combat veterans with PTSD. Interestingly though,
Blanchard noted that baseline cardiovascular responding in PTSD positive combat veterans is notably higher than veteran controls. While there appears to be a correlation between PTSD and higher resting heart rates, causation can not be implied. In other words, it can not yet be concluded that PTSD causes hypertension. One possible explanation for increased heart rate and blood pressure among PTSD subjects may be the sympathetic arousal (i.e. heightened noradrenergic activity) that's believed to occur with this disorder (Blanchard, 1990). Blanchard's hypothesis is supported by unpublished data from Brauman-Mintzer, Hernandez, & Mellman (cited in Mellman, Randolph, Brauman-Mintzer, Flores, & Milanes, 1992). Brauman-Mintzer et al., found that among a controlled study of combat veterans 53% of the PTSD positive subjects met criteria for hypertension, while only 31% of a VA psychiatric comparison group did; despite similarities in age and cardiovascular risk profile.

The epidemiological study conducted by Davidson et al. (1991) extends our understanding of PTSD and physical health morbidity since its subjects (N=2,985) were randomly drawn from the community and not solely limited to combat veterans. Results of this study indicated that subjects meeting a lifetime diagnosis of PTSD (versus those who did not) had significantly greater frequencies of bronchial asthma, hypertension, and peptic ulcer.

Two later studies which examined specific trauma populations (Escobar, Canino, Rubio-Stipec, & Bravo, 1992; McFarlane, Atchison, Rafalowicz & Papay, 1994) also suggest a significant relationship between PTSD and increased physical symptomatology. Following a flood disaster, Escobar et al. used the DIS to interview 375 individuals from Puerto Rican who had previously participated in a epidemiological survey. Those directly exposed to the flood had significantly higher rates of gastrointestinal and pseudoneurological symptoms post-flood compared to non-exposed individuals. Similarly, McFarlane et al. examined physical health comorbidity
among firefighters involved in a bush fire disaster. Results indicated that the PTSD-positive subjects were more likely than the control group to complain of physical symptoms and had more doctor visits following the fire. Likewise, the PTSD-positive subjects had significantly higher rates of cardiovascular, respiratory, musculoskeletal, and neurological symptoms. Self-report findings, however, were not supported by physician diagnoses in this study. Headaches were the only condition to be identified more frequently among the PTSD-positive subjects. Consequently, as with the Shalev et al. (1990) study, caution should be exercised when interpreting these findings.

In short, there is some evidence to suspect that PTSD is associated with physical health morbidity. Although it is premature to conclude that PTSD causes health problems, the literature does suggest that individuals with PTSD tend to report high rates of somatic illness. Within the field of psychoneuroimmunology there exists a separate body of literature that indicates stress mediates immune system functioning. High levels of psychological stress are thought to adversely compromise the body's immune system (Jemmott & Locke, 1984; Kiecolt-Glaser et al., 1984; Antoni, 1987 cited in Sarafino, 1990; Pennebaker, Kiecolt-Glaser, & Glaser, 1988; Zautra et al., 1989). Considering that PTSD is a traumatization response that causes further stress and anxiety for its sufferers, it is conceivable that the immune system may be negatively influenced when a PTSD response occurs. Since most of the data on PTSD and physical health morbidity comes from samples of combat veterans, extending the research to a variety of trauma populations to assess if similar somatic complaints are the norm across different traumas seems appropriate.

Problem Statement

Overall, the majority of studies on PTSD pertain to combat veterans. Very little is known about other populations frequently exposed to traumatic stress. Law
enforcement officers, by the nature of their occupation, are one such group that would be expected to commonly face traumatic events or situations. Indeed there is a substantial amount of research which suggests that police officers encounter high rates of job stress (see Farmer, 1990 for a literature review; Fishkin, 1988; Kroes, 1985; Martin, McKean, & Veltkamp, 1986; Symonds, 1970; Terry, 1981). Considering that most of these studies took place in the eighties, it is likely that these rates of police stress have increased in the nineties as the number of violent crimes, drug activity, and public hostility toward police officers has intensified. However, little information is available on the risk of PTSD among police officers (Saathoff & Buckman, 1990).

In fact, a 1986 study that assessed the presence of PTSD symptoms in a sample of police officers (N=53) was the first of its kind (Martin, McKean, & Veltkamp). Results of a questionnaire that probed for PTSD symptoms indicated that 26% of the subjects met DSM-III criteria for PTSD following a traumatic on-the-job event. Moreover, 60% said they had experienced one or more traumatic stressors on the job, while 32% admitted they had experienced three or more. The traumatic stressors that were endorsed were either related to personal victimization or working with victims. The range of traumatic stressors listed were shooting someone, being shot, working with child abuse, working with spouse abuse, being threatened or having family threatened, observing homicide deaths (including colleagues), observing suicide deaths, and observing a natural disaster. This study is important because it suggests that a significant number of police officers do suffer from PTSD as a result of traumatic stress. It also indicates that multiple traumatic stress is correlated with an increased risk for developing PTSD.

A later study by Gersons (1989) also suggests that PTSD is a likely consequence for police officers involved in serious on-the-job shootings. Gersons interviewed 37 police officers involved in shootings from 1977 through 1984, in
Amsterdam, to assess for PTSD. Data analysis revealed that 17 subjects (46%) met DSM-III criteria for the disorder. More specifically, 7 (19%) met current diagnoses; while 10 (27%) met lifetime diagnoses. Of the remaining 20 subjects, only 3 reported absolutely no symptoms of PTSD. The most frequent symptom for the entire sample (75%) was recurrent and intrusive recollections of the traumatic event.

A somewhat lower rate of PTSD were found during psychiatric evaluations of Virginia state police officers (Saathoff & Buckman, 1990). Twenty-six officers underwent psychological assessment to determine if they were capable of returning to work. Results indicated that 3 of the 26 officers (12%) met DSM-III-R criteria for PTSD. Although, this figure rises dramatically to 42% when considering only those subjects referred for post-trauma evaluations (3 out of 7). One of these three officers was diagnosed with chronic and delayed PTSD and deemed psychiatrically unable to return to work.

While not directly assessing for PTSD, several other studies support the notion that police officers, even those with years of job experience, can be susceptible to adverse emotional reactions following on-the-job trauma. Stratton, Parker & Snibbe (1984) assessed 60 police officers following shooting incidents on-the-job and discovered that 30% reported they were greatly affected by the experience. Common aftereffects were flashbacks, sleep problems, and fear of legal problems. Loo (1986) also found that during a one month post-trauma evaluation with 56 Canadian mounted police officers, the majority of officers were experiencing symptoms typical of PTSD. Thirty-nine percent were preoccupied with the trauma, 25% were angry over the incident, and 20% had sleep disturbances and flashbacks. Likewise, Duckworth (1991) reported that out of 34 police officers who assisted at a fire, 35% were assessed to be symptomatic for PTSD following the event.
At the same time, several studies have suggested that the negative psychological consequences of police work can be prevented or minimized by administrative action. Several studies indicate that when appropriate services are implemented by the department such as administrative involvement on the scene, critical incident debriefings, and mental health services, PTSD reactions are less likely to occur (Duckworth, 1991; Fraser, 1991; Alexander, 1993; Alexander & Wells, 1991). In absence of these types of services, however, the research has shown that police officers can be vulnerable to PTSD reactions.

Unfortunately, none of the subjects in the Gersons (1989) study sought psychological services to help deal with the bothersome memories of the traumatic experience(s). In the case of the Saathoff & Buckman (1990) study, approximately 61% of the subjects were department referred rather than self-referred. While this reluctance to seek help seems like unnecessary punishment for police officers, it appears to be the norm for this profession. The research in this area suggests that police culture is not very tolerant of those who express feelings, emotional reactions or psychological difficulties in response to work related traumatic stressors (Duckworth, 1991; Gersons, 1989). Thus, a PTSD reaction is at odds with the "police officer identity". Instead, it is more acceptable to employ joking or after work drinking as coping mechanisms (Gersons, 1989; Saathoff & Buckman, 1990). This hesitancy to seek treatment is apparently not unique to police officers, however. McFarlane (1989) reported that on average, only 1 out of every 20 individuals with PTSD actually comes forward for help.

Due to the fact that no prevalence studies of PTSD have been implemented among police officers, the only estimation of its occurrence is the few studies mentioned above. While these studies suggest that the majority of police officers maintain satisfactory mental health, they also indicate that a minority do not. With the
continuous rise in violent crimes (i.e. domestic assault, child abuse, rape, drug activity, gang related activity, drunk driving, homicides, suicides, etc.) in America, it is likely that police officers will continue to be high risk candidates for experiencing or witnessing traumatic events. Therefore, it is probable that a significant portion of them may encounter PTSD reactions at some point. Because police officers hold such an important role in society, it was thought to be beneficial to gain further understanding of the PTSD profile among this profession.

Knowing what we do about the risk for chronicity, psychological comorbidity, and physical health comorbidity among other populations of traumatized individuals, it seemed appropriate to examine these phenomena among police officers as well. First of all, if PTSD is associated with a high risk for chronicity, police officers may especially be at risk due to their reluctance to seek psychological treatment despite experiencing intrusive symptoms. Second, PTSD generally is associated with a high risk for psychological comorbidity; which could be problematic in a profession where the norm is to deny psychological difficulties. This is especially concerning when considering that the safety of citizens and police officers, alike, depends on the mental health of law enforcement officers in many situations. In addition, existing research suggests that PTSD with Axis II comorbidity may negatively impact treatment efficacy. In effort to offer police officers a treatment for PTSD that is time and cost effective (factors which are likely to be valued greatly in by police officers), diagnostic information about Axis II disorders may prove to be extremely useful. Third, the relationship between PTSD and physical health comorbidity is also relevant to police work since job performance often relies on physical fitness. For all of these reasons, an assessment of PTSD seemed warranted among police officers.

The primary goal of the present study was to gain further assessment of PTSD among law enforcement officers. In particular, the assessment aimed to gather
descriptive information on the range of traumatic stressors that trigger associated PTSD and to assess psychological and physical health comorbidity among this population.

In addition to the primary goal, the various relevance of different assessment tools in identifying PTSD sequelea was examined. Thus, it was hoped that this research would provide an opportunity to learn something about the performance of the screener, C-DIS-R, and MCMI-III as assessment tools for PTSD.

In light of the existing PTSD literature and preliminary information on police officers, several hypotheses were formulated. It was anticipated that the proposed assessment would reveal that a significant number of police officers would meet diagnostic criteria for PTSD. In fact, the proportion of PTSD positive officers was expected to be higher than previous studies have indicated. Furthermore, it was hypothesized that the types of traumatic stressors precipitating PTSD reactions would more often be job related than non-job related. In addition, it was believed that significant rates of psychological and physical health comorbidity would be found among this population of PTSD subjects.

With respect to the secondary goal of the research, it was hypothesized that the screening questionnaire would have predictive validity when its ability to detect PTSD was correlated with either of the other two standardized assessment instruments. Furthermore, the reliability of PTSD diagnostic assessments tools would be examined. The present research would, therefore, provide a better understanding of both the occurrence of PTSD within a sample of law enforcement officers and its psychological and physical health comorbidity, and greater insight into its measurement.
METHOD

Subjects

In response to recruitment efforts which targeted approximately 400 law enforcement officers, 49 individuals (12% response rate) completed and returned a traumatic stress screening questionnaire. However, two of these individuals were police dispatchers (both female) and thus, were excluded from the subject pool. The 47 remaining subjects were all male law enforcement officers actively employed at city, township, or county sheriff’s departments within the State of Michigan. Thirty-eight of these officers (81%) were able to be contacted by phone and agreed to partake in a structured clinical interview. The absence of female officers in the sample is believed to be, in part, a reflection of the small ratio of women employed in law enforcement.

Setting

Subjects were introduced to the study during recruitment visits to the city, township, and county sheriff’s department in which they were employed. When available, this initial contact was made at the beginning of roll call in the usual meeting location (i.e. squad room). Alternatively, officers were notified of the study by way of written materials distributed at the department (i.e. packets containing an information flyer, consent form, screening questionnaire, and return envelop). Officers who choose to participate in the study completed and returned the screening questionnaire on their own time. The majority of follow-up interviews were conducted on-site at officers respective departments; however, in the event that an officer was uncomfortable meeting at the work site an alternate, mutually agreed upon location was
selected (e.g. officer's home, coffee shop). All on-site interviews took place in a private area (i.e. conference room or separate office), in effort of promoting confidentiality and assisting officers to feel more at ease to talk.

Materials and Apparatus

**Self-report Measures**

For the first stage of participation, subjects were asked to complete the Traumatic Stress Questionnaire (see Appendix B) which resembles an adapted version of the Everstine Trauma Response Index (ETRI; Everstine & Everstine, 1993). In this study, the Traumatic Stress Questionnaire served as a screening measure to detect subjects who had experienced a traumatic event/ situation and consequent PTSD sequelea. The original ETRI is a 35 item, paper and pencil questionnaire that assesses for PTSD symptoms, symptom impact, and symptom duration. Typically the ETRI can be completed in 10-15 minutes. For purposes of this study, a modified version of the ETRI was used in order to account for the newly published DSM-IV PTSD diagnostic criteria and to accommodate for traumatic events/ situations that police officers may likely encounter. For example, to be consistent with DSM-IV criteria E (i.e. clinically significant distress or impairment in social, occupational, and/or other important areas of functioning) two questions were changed: question #4 from "Did you lose confidence in your work?" to "Did it interfere with your ability to perform at work?" and question #26 from "Did you change your life-style because of what happened?" to "Did it interfere with your social life or personal relationships?" In addition, the original ETRI questions which screened for associated features of PTSD or miscellaneous information were either changed to be more face valid with DSM-IV criteria or deleted to eliminate unnecessary items.
Furthermore, to accommodate for traumatic events/ situations related to law enforcement, several additional traumatic stressors were listed in part one of the adapted questionnaire (originally part four in the ETRI). To date there is no published reliability or validity data on the ETRI. Despite this shortcoming, the ETRI was still selected as a model for the screener due to an absence of a standardized assessment instrument for PTSD which could be self-administered in 10 minutes or less. The absence of reliability and validity data is primarily due to the fact that the author of the ETRI developed it for his own clinical use with traumatized patients and did not anticipate its widespread clinical use. However, the author reports that normative studies are currently underway (L. Everstine, personal communication, June 21, 1995).

During the second phase of participation (i.e. follow-up), subjects were asked to complete the paper and pencil version of the Millon Clinical Multiaxial Inventory-III (MCMI-III) (Millon, 1994). The MCMI-III is a 175 item inventory that is used for assessment and diagnosis of clinical syndromes and personality disorders. The MCMI-III requires an eight grade reading level and takes approximately 20-30 minutes to complete. Respondents endorse items with a true or false answer and 24 clinical scales are obtained from the results. In accordance with DSM-IV nomenclature, the MCMI-III provides information on 11 clinical personality patterns (schizoid, avoidant, depressive, dependent, histrionic, narcissistic, antisocial, aggressive/sadistic, compulsive, negativistic/ or passive-aggressive, and self-defeating), 3 severe personality pathologies (schizotypal, borderline, paranoid), 7 clinical syndromes (anxiety, somatoform, mania, dysthymic, alcoholic dependence, drug dependence, and post-traumatic stress disorder), and 3 severe clinical syndromes (thought disorder, major depression, delusional disorder). In addition, there are 3 correction scales which assist in the detection and adjustment of possible test-taking distortions (disclosure,
desirability, and debasement). For purposes of this study, the MCMI-III was used to assess Axis-II comorbidity, as well as to confirm a PTSD diagnosis.

Because the MCMI-III has just recently been released as a revised version of the MCMI-II, no reliability or validity data is yet available. However, the reliability of the MCMI-II appears to be quite good. The reported internal consistency coefficients (based on the Kuder-Richardson Formula 20) for all clinical scales range from .81 to .95; with the median internal consistency being .90 (Millon, 1987). Test-retest data from studies examining the stability of the MCMI-II with different populations indicate that test-retest reliability is higher among a nonclinical sample (i.e. coefficients ranged from .78 to .91 across all clinical scales) than with psychiatric outpatients (i.e. coefficients ranged from .59 to .81 and .64 to .85 across all clinical scales depending on when during the patients' treatment the two test administrations occurred) or psychiatric inpatients (i.e. coefficients ranged from .44 to .76, .43 to .75, and .46 to .80 across all clinical scales depending, also, on when during the patients' treatment the two test administrations occurred) (Millon, 1987). Data on the external validity of the MCMI-II suggests that it is a valid instrument as well (see MCMI-II manual; Millon, 1987).

Additionally at follow-up, subjects also completed a physical health questionnaire developed for purposes of this study. The Physical Health Questionnaire (see Appendix C) is a 12-item, paper and pencil instrument designed to assess overall physical health. More specifically, the Physical Health Questionnaire was included to provide information on the health status of subjects and to evaluate the relationship between traumatic stress and physical health.
Structured Interview

As part of the follow-up process, subjects took part in a structured diagnostic interview utilizing the computerized version of the Diagnostic Interview Schedule-Revised (C-DIS-R; Blouin, Perez, & Blouin, 1988). The C-DIS-R is a diagnostic aid that "provides DSM-III-R diagnostic information for over 40 Axis I diagnoses as well as Antisocial Personality [Axis II]" (C-DIS-R manual, p.1). The C-DIS-R provides both lifetime and current diagnoses. Current diagnoses are further broken down into those occurring within the past two weeks, month, six months, or year (C-DIS-R manual). Although the C-DIS-R was developed according to DSM-III-R diagnostic criteria, it should still be consistent with the current DSM-IV diagnosis of PTSD since changes in this most recent DSM have only been in clarifying the criteria for a traumatic event/situation; while the symptom clusters have remained the same. There are also existing questions in the C-DIS-R PTSD section that inquire about symptoms similar to those now listed as criteria E in the DSM-IV. Thus, the C-DIS-R is capable of adequately assessing for PTSD in a manner consistent with the DSM-IV.

Benefits of the C-DIS-R program are that it minimizes clinical judgment by providing the wording of questions, probing questions, and automatic branching among disorders and makes diagnostic decisions based solely upon items directed by the program (Blouin et al., 1988). Thus, the C-DIS-R can either be administered by trained lay interviewers or completed by subjects themselves. Typically, the C-DIS-R can be completed for most patients within 60-75 minutes (Morrison, 1988). For purposes of this study, the C-DIS-R was interviewer-administered to assess for PTSD sequelae, current or lifetime diagnoses of PTSD, and psychological comorbidity. Thus, with regard to these first two purposes the C-DIS-R also served as a comparison measure to the screening questionnaire.
The accuracy of the DIS (i.e. paper and pencil version) has been evaluated in a
test-retest study that compared independent administrations by psychiatrists and lay
interviewers for 216 subjects (inpatients, outpatients, ex-patients, and non patients)
(Robins, Helzer, Croughan, & Ratcliff, 1981). Results suggested that the DIS has
excellent test-retest reliability and is a valid instrument. The mean test-retest reliability
coefficient (i.e. K value) across all diagnoses in this study was .69. Furthermore, the
mean sensitivity (i.e. percentage of cases correctly identified by the lay interviewers
measured against the psychiatrists' diagnoses) across all diagnoses was 75%, while the
mean specificity (i.e. percentage of non cases correctly identified by the lay
interviewers measured against the psychiatrists' diagnoses) was 94%. Thus, this study
indicated that regardless of whether a clinician or lay interviewer administers the DIS, it
is a satisfactory instrument for making clinical diagnoses.

A follow-up study by Helzer et al., (1985) also found the DIS to be reliable and
valid when used with subjects from the general population. Overall percent agreement
between lay interviewers' and physicians' DIS diagnoses ranged from 86% to 99%
across all lifetime diagnoses. Specificities across all diagnoses ranged from 90% to
99%; however sensitivities were lower, ranging from 20% to 71%. Despite the low
sensitivity scores, the lay interviewers only showed bias for two diagnoses. They
significantly under diagnosed major depression and significantly over diagnosed
obsessive illness. Based upon the results, these researchers concluded that the lay
interviewers provided acceptable prevalence estimates of psychiatric illness in the
general population. Furthermore, the researchers suggested that in cases where
psychiatrists' diagnoses are impossible or impractical for research purposes, lay
interviewers' DIS diagnoses could adequately serve as substitutes. Because the present
investment also included a screening procedure prior to the administration of the
C-DIS-R, diagnostic accuracy is believed to be further improved.
Procedure

To obtain recruitment sites, phone contact was made with 17 departments (city, township, state, and county sheriff's) within Michigan to inquire about the likelihood of participation in the study (see Appendix D for phone script). For those departments who expressed interest in volunteering as a recruitment site, a meeting was scheduled with the police chief or head administrator to further explain the study and finalize recruitment approval in writing (Appendix E). Alternatively, when a meeting with the department head was unattainable, a recruitment letter (Appendix F) was sent to the department and appropriate authorization for recruitment was obtained by mail.

Following attainment of written approval, the student investigator, or a trained research assistant, visited participating departments to introduce the study and solicit volunteers. These visits were scheduled on multiple days and shifts to ensure that as many officer as possible were contacted. For those departments where recruitment visits were not feasible due to time constraints, recruitment alternatively took place by distribution of written materials.

Research assistants for the study were recruited from undergraduate psychology courses at Western Michigan University. Care was taken to effectively train and supervise research assistants in all areas in which participation in the study occurred. As part of this training, research assistants were oriented to the ethics of clinical research and confidentiality as required by Psychology Clinic procedures.

During recruitment visits a brief introduction of the study, approximately 5 minutes in length, was provided to all law enforcement officers present (see Appendix G for recruitment script). Recruitment efforts included inviting all law enforcement officers from the targeted sites to voluntarily participate in a study examining the occurrence of traumatic stress and its effects on the health of law enforcement officers.
Every attempt was made to clarify that the research was part of the student investigator's Masters degree requirements and in no way sponsored by the employing department. Thus, it was explained that participation was strictly voluntary (i.e. would occur on personal time and no overtime pay would be awarded) and that all individually obtained information would be kept confidential (i.e. withheld from department administration).

Participation requirements were also explained. Officers were informed that participation would consist of completing a consent form, 10-15 minute questionnaire inquiring about traumatic stressors and consequent effects, and one-on-one 2 hour follow-up interview (to be scheduled at a later day and time). Packets containing a consent form, traumatic stress questionnaire, and self-addressed/ stamped envelop were handed out to officers and instructions given for completing the materials. Time was allotted for officers to review the materials and ask questions. Emphasis was placed on the fact that officers could fill out the materials in private and return them directly to the student investigator via the envelop provided at their earliest convenience. Additionally, a drop box was left at each department so that uninterested officers could return their unused forms for future recycling.

Although the purpose of the follow-up interview was to verify a diagnosis (or lack thereof) of PTSD in relation to the screening questionnaire and assess psychological and physical comorbidity of officers with PTSD, potential subjects and departmental supervisors were simply informed that the researchers would follow-up with as many officers as possible. Therefore, it was explained that if an officer returned a signed consent form containing identifying information (i.e. name, number, address) and completed a traumatic stress questionnaire he/she was agreeing to be contacted by phone for scheduling of a follow-up interview. Hence, the total time
commitment for officer participation was estimated to be approximately 2 1/4 to 2 1/2 hours maximum.

As subjects' completed materials were received in the mail, a trained research assistant scored each screening questionnaire, to determine if items had been endorsed in a manner suggestive of PTSD. After direct contact with the author of the ETRI and discovery that no scoring manual was available, independent scoring criteria were developed for purposes of this study. For part one of the screening questionnaire, the frequency of personal and on-the job traumatic events were figured, as well as coded by type of trauma experienced. The remaining sections (i.e. part two, three, and four) were scored to provide a frequency count for the number of reexperiencing, avoidance, and hyperarousal symptoms endorsed by subject. A total symptom frequency across the three clusters was also obtained. In order for a checked symptom to be included, the intensity of the symptom had to be greater than 0 (on a scale of 0-10) and the duration at least one week. Overall mean intensity and duration scores were also computed across the three symptom clusters for each subject, as well as mean intensity scores by symptom clusters. Following these computations, a subject was assessed to be PTSD-positive if he/she had experienced a minimum of 1 reexperiencing, 3 avoidance, and 2 hyperarousal symptoms. Because this study was intended to be proceeded by a treatment study, officers with sub-threshold levels of PTSD were also deemed to be of clinical significance since they may benefit from treatment for their PTSD sequelea. Therefore, if a subject met the minimum criteria for at least two symptom clusters and had an overall mean intensity score of 5 (or greater), and overall mean duration score of 4 weeks (or longer) he/she was coded as PTSD-positive as well. Subjects who did not meet the minimum criteria for inclusion of PTSD, were coded as PTSD-negative.
After a subject's screening questionnaire was scored, the officer was contacted by phone to schedule a follow-up interview. Every attempt was made to schedule the follow-up interview within two weeks of receipt of the screening questionnaire. However, leeway was given if an officer's schedule made this requirement impossible.

While the primary investigator was prepared to exclude (from follow-up) any officer who was found to be experiencing an acute traumatic stress reaction (i.e. symptomatic response to traumatic event occurring in the past 30 days) for which counseling was being sought at the time of recruitment, no such action was necessary with any of the participating officers.

On the day of the follow-up interview, the subject and interviewer (i.e. primary investigator) meet individually at a mutually agreed upon location and time. In order to facilitate rapport with the subject, the interviewer allowed a few minutes of casual conversation with the subject before beginning the interview. Prior to beginning, the subject was also reminded that participation was voluntary and that all information would be kept confidential, except in the case where the subject posed a dangerous threat to himself or others. Subjects were also informed that they may terminate the interview at any point without penalty or negative consequences. Once this preliminary information was provided, subjects were then instructed on the procedures for the interview.

To ensure that the primary investigator was competent in administering the C-DIS-R, training occurred with an experienced interviewer. In addition, the primary investigator's C-DIS-R administration skills were observed and evaluated by a fully licensed, doctoral level psychologist prior to implementing the study. Only after approval was obtained from the licensed psychologist did the primary investigator begin conducting follow-up clinical interviews.
To begin the interview process some demographic information (i.e. age, sex, race, marital status, income, education, number of years in law enforcement, number of years employed at current department, and current job title) was obtained from subjects (see Appendix H). Next, the interviewer administered the C-DIS-R. Once the C-DIS-R was completed, subjects were given the option of taking a 5 minute break.

Following the break, subjects were asked to complete the paper and pencil version of the MCMII-III and the Physical Health Questionnaire. Instructions for these two instruments were provided and subjects were given ample time to complete them. Upon completion of the follow-up interview session, subjects were prompted to give feedback on the experience. Since many of the subjects had colleagues who had not yet completed the interview process, care was taken to limit information on hypotheses of the study when responding to officers' questions. However, officers were told that once the study was completed, a brief summary of the research findings would be sent to their respective departments and posted for viewing. Additionally, it was explained that this summary report would contain aggregate data only (across all participating departments) and that neither participating departments nor individual officers would be named; thus, maintaining participants' confidentiality. Finally, officers were asked if they would like to be contacted by the primary investigator in the future should additional research opportunities involving law enforcement officers become available. For those officers who said they would be interested in possibly participating in future research, a separate consent form was presented and consent obtained for future contact.

While responses to the C-DIS-R questions were scored systematically by the C-DIS-R program and results provided in summary reports according to conditions meeting full diagnostic criteria versus those that did not, further calculations were computed on the PTSD section. In order to examine the proximity of a PTSD
diagnosis, the PTSD question and answer section was printed for each subject and the proportion of PTSD threshold criteria met (i.e. 1 reexperiencing symptom, 3 avoidance symptoms, 2 hyperarousal, and duration of symptoms at least 1 month) was figured. This calculation was called the PTSD Ratio and values ranged from 0 (none of the four threshold criteria met) to 1.0 (all four threshold criteria met, indicating a diagnosis of PTSD). The MCMI-III was hand-scored according to procedures outlined in the hand-scoring user’s guide (Millon, 1994). Raw scores were calculated for all scales and then transformed into base rate scores. Next, Disclosure, Anxiety/Depression (A/D), and Denial/Complaint adjustments were made resulting with final base rates scores for each scale. For coding purposes, final MCMI-III base rate scores of 60 or greater were included as positive diagnoses; whereas those below 60 were excluded. Due to the intricacies of hand-scoring the MCMI-III all profiles were scored twice, by independent scorers, to ensure accuracy.

Human Subjects Protection

All information received from subjects during the study was kept entirely confidential. In other words, neither fellow officers nor administrators (i.e. police chief, lieutenants, or sergeants) had access to or were privy of data collected from individual subjects. However, there was one department which requested that their participation in the study be contingent upon information on how their officers fared in comparison to other subjects. This department was excluded from participating as a recruitment site. All other departments abided by the confidentiality guidelines explained at the onset of the study. Additionally, research assistants were trained and oriented to the ethics of clinical research, including the importance of subject confidentiality. While the exceptions to confidentiality were addressed in the consent
form, no subject was assessed to be a dangerous threat to himself or others during the
course of the study.

To help ensure confidentiality, all data collected from subjects was identified by
an assigned code number versus name (with the exception of the consent form which
contained identifying information for contacting subjects for follow-up). This was
achieved by pre-coding the first page of the consent form with an assigned number,
starting with the number 1000 and continuing with even numbers (e.g. 1002, 1004,
1006. etc.) until the desired number of subjects was exhausted. The second page of the
consent form contained subjects' identifying information (i.e. name, signature,
address, and phone number). Following the receipt of a completed consent form and
screening questionnaire (via mail), subject's names and code numbers were added to a
master list, which was kept in a separate location from the data. Afterwards, page one
and two of the consent forms were ripped apart and stored in separate locked files at the
Psychology Clinic (located on the 4th floor of the KCMS Unified Clinics Building at
1000 Oakland) on the campus of Western Michigan University. Consequently, the
screening questionnaire and all other data collected at the follow-up interview (i.e.
demographic questionnaire, C-DIS-R floppy disks, MCMI-III, and Physical Health
Questionnaire) were identified with this pre-assigned code number rather than name and
stored in a locked filing cabinet in the Psychology Clinic. All data will be maintained in
its original form for a minimum of three years and destroyed thereafter. In the event
that the data are published, this holding period will be extended for a minimum of five
years following publication.

A summary report of research findings was sent to all participating departments.
Subjects and department heads were previously instructed that this summary would
contain aggregate data only (across all participating departments) and neither
participating departments nor individual officers would be named; thus, maintaining
confidentiality. In addition, in effort to minimize the possibility that a subject would be identified in this report, reference to the "type" of traumatic event encountered by subjects (as categorized on the screening questionnaire) was not included in this report unless at least four incidents of any particular type of traumatic event were disclosed across departments.

In regard to publishing the data or presenting at professional conferences, where there were fewer than four cases of a particular type of traumatic event reported across departments or an event which easily identified any one officer (discovered during data analysis), consent to include this data was obtained from the corresponding officer(s) (see Appendix I). This procedure of obtaining consent occurred before the master list of names and code numbers was destroyed.

Primarily the main benefit for police officers who participated in the study was the personal satisfaction of volunteering for research aimed at better understanding the effects of traumatic stress on psychological and physical health among those in their own profession. Thus, they had the satisfaction of contributing to the growth of scientific knowledge on the mental health of law enforcement officers. Also, it is believed that participation provided officers an unusual opportunity to share their traumatic experiences and related feelings with an objective listener as evidenced by the willingness of a majority of the officers to talk at great length about their traumatic experiences and consequent vulnerable feelings, and by a minority of officers who broke down in tears when recounting their experiences. This may have been particularly beneficial since the norm in police culture is to deny or withhold feelings from colleagues and superiors. Furthermore, all subjects who completed a follow-up interview were provided with a mental health resource list, which may have assisted officers experiencing PTSD sequelea in finding appropriate treatment, if desired or deemed necessary. Every attempt was made to normalize PTSD symptoms as a
common reaction to overwhelming trauma, which may have further helped to de­
stigmatize the disorder and facilitate treatment acceptance among officers. Last,
subjects may indirectly benefit from participating in this study should the present results
on PTSD comorbidity lend themselves to future treatment studies which teach us how
to treat PTSD more effectively. As a population that is exposed to increasing rates of
violent crime and possibly high rates of traumatic stress, these improvements in PTSD
treatments may be particularly beneficial to law enforcement officers.

Some possible risks of participating in the study also need to be addressed. To
begin with, participation required subjects to access traumatic memories and answer
questions about the experience(s). Disclosing sensitive information regarding traumatic
experiences may have caused some subjects to feel embarrassed or anxious. There is
also the possibility that officers who volunteered to participate in the follow-up
interview may have faced ridicule or negative social pressure from colleagues.
Alternatively, officers not wishing to participate in the study may have faced pressure
from superiors to volunteer.

In reference to these above possible risks, several precautions were taken to
protect subjects. To begin with, subjects were required to read and sign an informed
consent form (Appendix J) that addressed the general procedures of the research prior
to participating in the follow-up interview. Thus, subjects were aware that by signing
the consent form and returning it along with a completed screening questionnaire, they
would be volunteering to participate in a follow-up interview that would last
approximately 2 hours and examine the effects of traumatic stress on psychological and
physical health. The consent form also stated that participation was strictly voluntary
and independent from the department in which officers were employed. Departmental
supervisors were also reminded that participation was voluntary, and instructed not to
pressure officers about participating.
In addition, the consent form pointed out that subjects had the right to withdraw from the research project at any point without negative consequences. The benefits and risks mentioned above were also included. The original copy of the signed consent forms were placed in a locked filing cabinet in the Psychology Clinic. Moreover, the primary investigator's and faculty advisor's names, departmental addresses, and departmental phone numbers were made available to subjects (i.e. copies left at participating departments), in the event that questions or concerns should arise. However, to the best of the primary investigator's knowledge, no problems or concerns were ever voiced by subjects or department officials.

While discussion of past traumas did evoke an emotional response in a few subjects (i.e. crying), no subject requested to terminate the interview or was deemed unable to complete the interview. In fact, all officers who demonstrated an emotional reaction during the follow-up interview commented that being able to talk about their experiences openly with someone outside the department was helpful, and while they were a little embarrassed about crying, felt it was cathartic.
RESULTS

Preliminary Results

To recruit subjects for the study 17 police departments (city, township, state, and county sheriff's) were contacted. Out of the 17 departments, 10 agreed to participate as recruitment sites resulting in a 59% response rate. Of those that participated, the average department size was 52 officers, yet departments ranged from 9 to 150 officers.

All subjects who completed both the screening questionnaire and a follow-up interview were male (N=38) and ranged in age from 24 to 48 years old, with a mean age of 38 (SD= 6.45). Further, 33 of the subjects were Caucasian (87%), 2 Native American (5%), 1 African-American (3%), and 2 "Other" (5%). Of the two officers who responded "other", one identified himself as African-American and Native-American, and the other as Italian-American. The majority of subjects were married (89%), although 3 were divorced or separated (8%) and 1 had never been married (3%). All but 4 of the officers reported receiving a college degree, including either an associates (n=11), bachelors (n=22), or master's (n=1). On average, subjects had 14.8 years of experience in law enforcement (SD= 6.74), with the range being from 2.5- 24 years. Furthermore, the mean number of years officers had been employed at their current department was 12.8 years (SD= 7.22), with a range of 1.75- 24 years. Seventy-nine percent of them worked for a city or township department (n=30), while 21% were employed by a county sheriff's department (n=8). With respect to job title, 18 were patrolmen (47%), 9 sergeants (24%), 4 detectives (11%), 3 lieutenants (8%),
and 2 deputies (5%) and public safety officers (5%), respectively. The average length of time for the follow-up interview was approximately 3 hours.

Preliminary Analysis

The measures in this study, the Traumatic Stress Questionnaire, Demographic Questionnaire, C-DIS-R, MCMI-III, and Physical Health Questionnaire, were used to provide qualitative information on the relationship between PTSD and psychological and somatic comorbid conditions among law enforcement officers. Because the primary goal of this study was to establish descriptive information on the occurrence of PTSD and collateral conditions of the disorder, the majority of the data was analyzed utilizing descriptive statistics. Therefore, the findings from each instrument were combined across subjects and graphed in summary tables where appropriate. Furthermore, Chi-Square analyses were performed on categorical data to determine if observed frequencies were significant or at chance levels. Likewise, contingency tables were used to compare relationships between instruments with respect to occurrences of Axis I, Axis II, and physical health comorbid conditions. Also, to examine relationships between selected variables from the instruments, Pearson Correlation Coefficients were obtained.

Screener

Twenty-five (66%) subjects reported they had experienced at least one personal trauma (i.e. non-job related) at some point in their lives. Accordingly, the mean number of personal traumas among subjects was 1.40 (SD= 1.48, range 0-5). The types and frequencies of personal traumas were as follows: victim of violent crime (n=7), victim of vehicle accident (n=9), victim of natural disaster (n=5), victim of accident in home (n=6), victim of accident at work (n=11), victim of war combat
(n=2), other but can not say (n=1), and other (n=12). Alternatively, all subjects (N=38) responded that they had encountered at least one "on-the-job" traumatic event, with the mean number being 5.87 (SD=1.40, range 1-8, mode=6). The types and frequencies of traumatic events either witnessed or experienced while on-the-job were: homicide death (n=32), suicide death (n=34), motor vehicle accident (n=38), child death (n=33), personal injury of another (n=34), shooting someone (n=4), shot or shot at (n=10), physically attacked (n=24), other but can not say (n=2), and other (n=13). Based on inclusionary criteria of the screener, 21 (55%) of the 38 subjects were identified as having PTSD. Of the 17 (45%) subjects who were excluded from the diagnosis, only 3 (7.9%) reported a total absence of PTSD symptoms.

The mean number of PTSD symptoms endorsed across all symptom clusters (i.e. reexperiencing, avoidance, hyperarousal) on the screener was 7.95 (SD=5.39, range 0-21). The mean intensity of PTSD symptoms, rated on a 10-point Likert scale from 0= no distress/ concern at all to 10= extreme distress/ concern, across all three symptom clusters was 5.806 (SD=2.346, range 0-8.75). Further, the mean duration (in weeks) of symptoms across all three clusters was 60.40 (SD=57.806, range 0-197). See Table 1 for the mean number of PTSD symptoms and mean intensity of symptoms by symptom cluster.

**Physical Health Questionnaire**

Table 2 summarizes the total number of lifetime physical health conditions reported by subjects. The majority of subjects (n=12, 32%) reported suffering from one physical health condition during their lifetime (modal number). The total number of lifetime physical health conditions ranged from 0-6 across subjects, with the mean number of physical health conditions being 2.053 (SD=1.68). Six subjects (16%) indicated they had never experienced any health problems. See Table 3 for a list of
### Table 1

<table>
<thead>
<tr>
<th>Symptom Cluster</th>
<th>Mean Number</th>
<th>SD</th>
<th>Range</th>
<th>Mean Intensity (0-10)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reexperiencing</td>
<td>1.90</td>
<td>1.27</td>
<td>0-5</td>
<td>5.33</td>
<td>2.98</td>
</tr>
<tr>
<td>Avoidance</td>
<td>2.58</td>
<td>2.15</td>
<td>0-7</td>
<td>5.11</td>
<td>3.09</td>
</tr>
<tr>
<td>Hyperarousal</td>
<td>3.47</td>
<td>2.70</td>
<td>0-9</td>
<td>6.02</td>
<td>2.70</td>
</tr>
</tbody>
</table>

### Table 2

Frequency of Total Number of Lifetime Physical Health Conditions  
(N=38)

<table>
<thead>
<tr>
<th>Total Number Health Conditions</th>
<th>Number of Subjects Reporting</th>
<th>Percentage of Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>6</td>
<td>15.8</td>
</tr>
<tr>
<td>1</td>
<td>12</td>
<td>31.2</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>21.1</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>7.9</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>15.8</td>
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<td>5</td>
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<td>2.6</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>5.3</td>
</tr>
</tbody>
</table>

Physical health conditions reported by subjects. Columns 2 and 3 represent the number and percentage of subjects endorsing each condition. Data column 4 represents the mean duration of the condition across subjects, while column 5 indicates the mean level of subjective distress caused by the condition. Last, column 6 represents how many
subjects reported the corresponding condition to "still be present" at the time of the interview.

Table 3
Prevalence of Physical Health Conditions in Total Sample (N=38)

<table>
<thead>
<tr>
<th>Condition</th>
<th>n</th>
<th>%</th>
<th>Mean Duration (Wks)</th>
<th>Mean Level of Distress (0-3)</th>
<th>No. Still Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back Pain</td>
<td>13</td>
<td>34.2</td>
<td>216</td>
<td>1.9</td>
<td>5</td>
</tr>
<tr>
<td>Allergies</td>
<td>11</td>
<td>30.0</td>
<td>1560</td>
<td>1.5</td>
<td>11</td>
</tr>
<tr>
<td>Headaches</td>
<td>9</td>
<td>23.7</td>
<td>94</td>
<td>2.1</td>
<td>3</td>
</tr>
<tr>
<td>Gastrointestinal Problems</td>
<td>6</td>
<td>15.8</td>
<td>370</td>
<td>2.2</td>
<td>-</td>
</tr>
<tr>
<td>Fatigue</td>
<td>5</td>
<td>13.2</td>
<td>88</td>
<td>1.8</td>
<td>1</td>
</tr>
<tr>
<td>Weight Loss (unintentional)</td>
<td>5</td>
<td>13.2</td>
<td>26</td>
<td>1.6</td>
<td>-</td>
</tr>
<tr>
<td>Hypertension</td>
<td>4</td>
<td>10.5</td>
<td>403</td>
<td>.5</td>
<td>3</td>
</tr>
<tr>
<td>Vision Problems</td>
<td>4</td>
<td>10.5</td>
<td>406</td>
<td>1.8</td>
<td>3</td>
</tr>
<tr>
<td>Chest Pains</td>
<td>3</td>
<td>7.9</td>
<td>3</td>
<td>1.7</td>
<td>2</td>
</tr>
<tr>
<td>Arthritis</td>
<td>3</td>
<td>7.9</td>
<td>754</td>
<td>1.7</td>
<td>2</td>
</tr>
<tr>
<td>Skin Rashes</td>
<td>2</td>
<td>5.3</td>
<td>676</td>
<td>1.0</td>
<td>2</td>
</tr>
<tr>
<td>Asthma</td>
<td>2</td>
<td>5.3</td>
<td>1092</td>
<td>1.0</td>
<td>2</td>
</tr>
<tr>
<td>Sexual Dysfunction</td>
<td>2</td>
<td>5.3</td>
<td>32</td>
<td>1.5</td>
<td>-</td>
</tr>
<tr>
<td>Seizures</td>
<td>2</td>
<td>5.3</td>
<td>1560</td>
<td>1.5</td>
<td>1</td>
</tr>
<tr>
<td>Ulcer</td>
<td>2</td>
<td>5.3</td>
<td>52</td>
<td>2.0</td>
<td>-</td>
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<tr>
<td>Diabetes</td>
<td>1</td>
<td>2.6</td>
<td>156</td>
<td>1.0</td>
<td>1</td>
</tr>
<tr>
<td>Audiological Problems</td>
<td>1</td>
<td>2.6</td>
<td>572</td>
<td>1.0</td>
<td>1</td>
</tr>
<tr>
<td>Chronic Pain</td>
<td>1</td>
<td>2.6</td>
<td>260</td>
<td>3.0</td>
<td>1</td>
</tr>
</tbody>
</table>
Table 3- Continued

<table>
<thead>
<tr>
<th>Condition</th>
<th>n</th>
<th>%</th>
<th>Mean Duration (Wks)</th>
<th>Mean Level of Distress (0-3)</th>
<th>No. Still Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>1</td>
<td>2.6</td>
<td>2496</td>
<td>2.0</td>
<td>1</td>
</tr>
<tr>
<td>Urinary Tract Infection</td>
<td>1</td>
<td>2.6</td>
<td>156</td>
<td>3.0</td>
<td>1</td>
</tr>
</tbody>
</table>

Of the 32 officers who reported physical health problems at some point in their lives, 27 (84%) indicated that a physician had diagnosed at least one of their health conditions. In response to whether or not officers perceived any of their physical health conditions to be related to traumatic stressors encountered, 22 (69%) said "no", 7 (22%) said "yes", and 3 (9%) reported they were "not sure." The most frequently reported health conditions that subjects perceived to be related to traumatic stress were: hypertension (n=3), headaches (n=3), and gastrointestinal problems (n=2). Back pain, chest pain, chronic pain, fatigue, weight loss, and vision problems (n=1, respectively) were also thought to be related.

C-DIS-R

A summary of all C-DIS-R diagnoses detected in the total sample is presented in Table 4. The average number of C-DIS-R Axis I diagnoses for subjects was 2.158 (SD=1.96, range= 0-6). Clearly, the most prevalent diagnoses found among officers were: alcohol abuse/dependence (n=22), nicotine dependence (n=14), major depressive episodes (n=9), post-traumatic stress disorder (n=8), and depression/melancholic type (n=7).
Table 4
Prevalence of C-DIS-R Diagnoses Among Law Enforcement Officers
(N=38)

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n)</td>
</tr>
<tr>
<td>Alcohol Abuse/Dependence</td>
<td>22</td>
</tr>
<tr>
<td>Nicotine Dependence</td>
<td>14</td>
</tr>
<tr>
<td>Major Depressive Episode</td>
<td>9</td>
</tr>
<tr>
<td>Post-Traumatic Stress Disorder</td>
<td>8</td>
</tr>
<tr>
<td>Depression, Melancholic Type</td>
<td>7</td>
</tr>
<tr>
<td>Depression, Recurrent</td>
<td>6</td>
</tr>
<tr>
<td>Somatoform Pain Disorder</td>
<td>5</td>
</tr>
<tr>
<td>Cannabis Abuse/Dependence</td>
<td>5</td>
</tr>
<tr>
<td>Social Phobia</td>
<td>3</td>
</tr>
<tr>
<td>Simple Phobia</td>
<td>3</td>
</tr>
<tr>
<td>Manic Episode</td>
<td>3</td>
</tr>
<tr>
<td>Bipolar</td>
<td>2</td>
</tr>
<tr>
<td>Dysthymia</td>
<td>1</td>
</tr>
<tr>
<td>Depression NOS</td>
<td>1</td>
</tr>
<tr>
<td>Bulimia</td>
<td>1</td>
</tr>
</tbody>
</table>

Of the 8 (21%) subjects who were PTSD-positive on the C-DIS-R, 5 (63%) meet PTSD criteria for two separate traumatic events; while the remaining 3 (38%) had only one qualifying traumatic event. Thus, among the 8 PTSD-positive subjects there were 10 (76%) lifetime diagnoses of PTSD and 3 (23%) current diagnoses (i.e. symptoms present within 1-6 months of the interview). For a list of the types and
frequencies of traumatic events associated with both current and lifetime diagnoses of PTSD (by C-DIS-R categories) see Table 5. Of the 13 PTSD qualifying events, 5 (38%) were personal traumas; while 8 (62%) were on-the-job traumas. Some examples of subjects' personal traumas were: Vietnam combat duty, being in a tornado, being in a serious car accident, and spouse dying from unexpected brain aneurysm. Examples of subjects' on-the-job traumas were: being shot at, being caught in a fire and forced to jump out a window, witnessing a fatal shooting of suspect, injuring knee in foot case of suspect, shooting and killing a suspect, and witnessing a suicide. Of the 30 (79%) PTSD-negative subjects, only 3 had absolutely no symptoms for PTSD. PTSD Ratio figures were as follows: 0 (n=3, 7.9%), .25 (n=7, 18%), .50 and .75 (n=10, 26% respectively), and 1.0 (n=8, 21%).

<table>
<thead>
<tr>
<th>Traumatic Event</th>
<th>Current PTSD (n)</th>
<th>Lifetime PTSD (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seeing someone killed/ injured</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Sudden injury/ accident</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>News of sudden death</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Military Combat</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Natural Disaster</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Narrow escape from death/ injury</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Threatened with weapon</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 5
Triggering Events for Current and Lifetime PTSD on the C-DIS-R
MCMI-III

A summary of all MCMI-III diagnoses detected in the total sample is presented in Table 6. The mean number of MCMI-III diagnoses (overall) was 4.5 (SD=2.76, range=2-14), while the mean number of Axis II scales was 3.24 (SD=.1.44, range 1-6). The most frequently occurring diagnoses were: avoidant PD (n=30), narcissistic PD (n=22), histrionic PD (n=17), compulsive PD (n=17), and anxiety disorder (n=11). Post-traumatic stress disorder (n=9) was the sixth most prevalent diagnosis among officers, occurring in nearly 24% of the subjects.

Table 6
Prevalence of MCMI-III Diagnoses Among Law Enforcement Officers
(N=38)

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Total Sample (n)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoidant PD</td>
<td>30</td>
<td>79.0</td>
</tr>
<tr>
<td>Narcissist PD</td>
<td>22</td>
<td>57.9</td>
</tr>
<tr>
<td>Histrionic PD</td>
<td>17</td>
<td>44.7</td>
</tr>
<tr>
<td>Compulsive PD</td>
<td>17</td>
<td>44.7</td>
</tr>
<tr>
<td>Anxiety Disorder</td>
<td>11</td>
<td>29.0</td>
</tr>
<tr>
<td>Post-Traumatic Stress Disorder</td>
<td>9</td>
<td>23.7</td>
</tr>
<tr>
<td>Schizoid PD</td>
<td>8</td>
<td>21.1</td>
</tr>
<tr>
<td>Bipolar Disorder</td>
<td>8</td>
<td>21.1</td>
</tr>
<tr>
<td>Somatoform Disorder</td>
<td>6</td>
<td>15.8</td>
</tr>
<tr>
<td>Aggressive (Sadistic) PD</td>
<td>5</td>
<td>13.2</td>
</tr>
<tr>
<td>Passive-Aggressive (Negativistic) PD</td>
<td>4</td>
<td>10.5</td>
</tr>
<tr>
<td>Paranoid PD</td>
<td>4</td>
<td>10.5</td>
</tr>
</tbody>
</table>
Table 6- Continued

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Total Sample (n)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schizotypal PD</td>
<td>3</td>
<td>7.9</td>
</tr>
<tr>
<td>Dependent PD</td>
<td>3</td>
<td>7.9</td>
</tr>
<tr>
<td>Thought Disorder</td>
<td>3</td>
<td>7.9</td>
</tr>
<tr>
<td>Major Depression</td>
<td>3</td>
<td>7.9</td>
</tr>
<tr>
<td>Self-Defeating PD</td>
<td>2</td>
<td>5.3</td>
</tr>
<tr>
<td>Dysthymia</td>
<td>2</td>
<td>5.3</td>
</tr>
<tr>
<td>Alcohol-Dependence</td>
<td>2</td>
<td>5.3</td>
</tr>
<tr>
<td>Drug Dependence</td>
<td>2</td>
<td>5.3</td>
</tr>
<tr>
<td>Delusional Disorder</td>
<td>2</td>
<td>5.3</td>
</tr>
<tr>
<td>Depressive PD</td>
<td>2</td>
<td>5.3</td>
</tr>
<tr>
<td>Antisocial PD</td>
<td>1</td>
<td>2.6</td>
</tr>
</tbody>
</table>

PTSD Assessment Measure Comparison

With respect to instrument reliability in identifying PTSD, the screener assessed 21 subjects to be PTSD-positive, the C-DIS-R 8, and the MCMI-III 9 (see Table 7). Diagnostic agreement was figured by dividing the number of agreements by the total number of agreements plus disagreements (i.e. A/A+ D). Accordingly, diagnostic agreement between the C-DIS-R and MCMI-III was 41% since both instruments identified 5 of the same subjects to have PTSD, yet disagreed on 7 others. Diagnostic agreement was somewhat lower for the screener in comparison to the C-DIS-R (32% agreement) and MCMI-III (30% agreement). Agreement across all three instruments was 17%.
Table 7
Diagnostic Agreement for PTSD Across Measures (N=38)

<table>
<thead>
<tr>
<th>Subject #</th>
<th>Screener</th>
<th>C-DIS-R</th>
<th>MCMI-III</th>
</tr>
</thead>
<tbody>
<tr>
<td>1032</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1062</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>1070</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1074</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>1110</td>
<td>X</td>
<td></td>
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</tr>
<tr>
<td>1140</td>
<td>X</td>
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<tr>
<td>1168</td>
<td>X</td>
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<tr>
<td>1236</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>1248</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1290</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>1300</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>1318</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>1342</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>1346</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>1376</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1394</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1398</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1406</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>1158</td>
<td>X</td>
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<td>1164</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1274</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2016</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Total number of traumas on the screener was neither strongly correlated with PTSD Ratio (personal, $r= .308$; on-the-job, $r= .136$, combined, $r=.294$) nor MCMI-III PTSD (personal, $r=.018$; on-the-job, $r= -.003$, combined, $r=.01$). However, there appeared to be a moderate relationship between total number of PTSD symptoms on the screener and C-DIS-R diagnoses of major depressive episode ($r= .692$) and major depression- recurrent (.681). Similarly, total number of PTSD symptoms on the screener was moderately related to PTSD Ratio ($r=.644$). Total number of PTSD symptoms on the screener was not highly related to any of the MCMI-III scales, yet the strongest correlations were with diagnoses of MCMI PTSD and MCMI anxiety ($r=.455$ and .326, respectively). PTSD symptom intensity on the screener proved to be narrowly correlated with all MCMI-III and C-DIS-R diagnoses, although PTSD was the strongest relationship on the C-DIS-R ($r=.355$) and second strongest on the MCMI-III ($r=.438$). A stronger relationship was shown to exist between screener PTSD symptom intensity and PTSD Ratio ($r= .706$).

Substantial differences between C-DIS-R PTSD-positive and PTSD-negative subjects were found with respect to several Axis I conditions (as assessed by the C-DIS-R). Subjects with PTSD were significantly more likely to have the following collateral Axis I diagnoses: somatoform pain disorder ($x^2= 12, df=1, p=.0005$), major
depressive episode ($x^2=8, df=1, p=.0037$), manic episode ($x^2=4, df=1, p=.0435$), bipolar disorder ($x^2=8, df=1, p=.0049$), depressive episode of melancholic type ($x^2=7, df=1, p=.0095$), and depression NOS ($x^2=3.85, df=1, p=.0497$). Table 8 represents the rates of C-DIS-R Axis I conditions co-occurring with C-DIS-R PTSD. The data in column 1 presents the lifetime prevalence of the corresponding diagnoses across subjects. Data column 2 presents the proportion of subjects in the total sample who had both PTSD and the corresponding diagnosis. Data column 3 presents the percentage of C-DIS-R PTSD-positive subjects who had the corresponding diagnosis.

C-DIS-R diagnosed PTSD was also found to be significantly related to several MCMI-III scales. With respect to MCMI-III Axis II disorders, C-DIS-R PTSD-positive subjects were significantly more likely, than PTSD-negative subjects, to meet diagnostic criteria for aggressive-sadistic personality disorder ($x^2=5.255, df=1, p=.0219$). Likewise, there was a significant relationship between C-DIS-R PTSD and three MCMI-III Clinical Syndromes. PTSD-positive subjects were more likely to have MCMI-III diagnoses of anxiety ($x^2=16.891, df=1, p=.0001$), bipolar/ manic ($x^2=10.474, df=1, p=.0012$), and PTSD ($x^2=8.447, df=1, p=.0037$). Also, there was a significant relationship between C-DIS-R PTSD and one MCMI-III Severe Syndrome, such that PTSD-positive subjects were at greater chance for meeting diagnostic criteria for MCMI-III thought disorder ($x^2=4.077, df=1, p=.0435$). See Table 9 for prevalence rates of MCMI-III diagnoses co-occurring with C-DIS-R PTSD. The mean number of MCMI-III Axis II comorbid conditions among C-DIS-R PTSD-positive subjects was 2.75 (SD=.89), compared to 3.1 (SD=1.32) for PTSD-negative subjects.

C-DIS-R PTSD was also found to have a statistically significant relationship with several physical health conditions (as assessed by the Physical Health
Table 8
Rates of C-DIS-R Axis I Diagnoses Co-Occurring With C-DIS-R PTSD Among Law Enforcement Officers (N=38)

<table>
<thead>
<tr>
<th>C-DIS-R Diagnosis</th>
<th>Prevalence in Sample (%)</th>
<th>Joint Prevalence with PTSD in Total Sample (%)</th>
<th>Percentage of PTSD Subjects with Diagnosis (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol Abuse/ Dependence</td>
<td>57.9</td>
<td>13.2</td>
<td>62.5</td>
</tr>
<tr>
<td>Nicotine Dependence</td>
<td>36.8</td>
<td>5.3</td>
<td>25.0</td>
</tr>
<tr>
<td>Major Depressive Episode**</td>
<td>23.7</td>
<td>13.2</td>
<td>62.5</td>
</tr>
<tr>
<td>PTSD</td>
<td>21.1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Depression, Melancholic**</td>
<td>18.4</td>
<td>10.5</td>
<td>50.0</td>
</tr>
<tr>
<td>Depression, Recurrent</td>
<td>15.8</td>
<td>7.9</td>
<td>37.5</td>
</tr>
<tr>
<td>Somatoform Pain Disorder**</td>
<td>13.2</td>
<td>10.5</td>
<td>50.0</td>
</tr>
<tr>
<td>Cannabis Abuse/ Dependence</td>
<td>13.2</td>
<td>5.3</td>
<td>25.0</td>
</tr>
<tr>
<td>Manic Episode*</td>
<td>7.9</td>
<td>5.3</td>
<td>25.0</td>
</tr>
<tr>
<td>Bipolar Disorder**</td>
<td>5.3</td>
<td>5.3</td>
<td>25.0</td>
</tr>
<tr>
<td>Depression NOS*</td>
<td>2.6</td>
<td>2.6</td>
<td>12.5</td>
</tr>
</tbody>
</table>

** p<.01
* p<.05

Questionnaire). See Table 10 for a summary of physical health conditions co-occurring with C-DIS-R PTSD. Collateral health conditions that had greater than chance occurrences in PTSD-positive versus PTSD-negative subjects were: gastrointestinal problems (x2=8.919, df=1, p=.0028), fatigue (x2=5.255, df=1, p=.0219), weight loss (x2=5.255, df=1, p=.0219), and chronic pain (x2=3.851, df=1, p=.0497).

Overall, PTSD-positive subjects reported having an average of 3.13 physical conditions (SD=1.88, range 1-6), which was approximately one above the sample mean of 2.05.
Table 9
Prevalence Rates of MCMI-III Diagnoses Co-Occurring With C-DIS-R PTSD
(N=38)

<table>
<thead>
<tr>
<th>MCMI-III Diagnosis</th>
<th>Prevalence in Sample (%)</th>
<th>Joint Prevalence with C-DIS-R PTSD in Total Sample (%)</th>
<th>Percentage of PTSD Subjects with Diagnosis (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoidant</td>
<td>80.0</td>
<td>18.4</td>
<td>87.5</td>
</tr>
<tr>
<td>Narcissitic</td>
<td>57.9</td>
<td>7.9</td>
<td>37.5</td>
</tr>
<tr>
<td>Histrionic</td>
<td>44.7</td>
<td>5.2</td>
<td>25.0</td>
</tr>
<tr>
<td>Compulsive</td>
<td>44.7</td>
<td>7.9</td>
<td>37.5</td>
</tr>
<tr>
<td>Anxiety**</td>
<td>29.0</td>
<td>18.4</td>
<td>87.5</td>
</tr>
<tr>
<td>PTSD**</td>
<td>23.7</td>
<td>13.2</td>
<td>62.5</td>
</tr>
<tr>
<td>Bipolar-Manic**</td>
<td>21.1</td>
<td>13.2</td>
<td>62.5</td>
</tr>
<tr>
<td>Schizoid</td>
<td>21.5</td>
<td>7.9</td>
<td>37.5</td>
</tr>
<tr>
<td>Dependent</td>
<td>21.1</td>
<td>7.9</td>
<td>37.5</td>
</tr>
<tr>
<td>Somatoform</td>
<td>15.8</td>
<td>2.6</td>
<td>12.5</td>
</tr>
<tr>
<td>Aggressive-Sadistic*</td>
<td>13.2</td>
<td>7.9</td>
<td>37.5</td>
</tr>
<tr>
<td>Passive-Aggressive</td>
<td>10.5</td>
<td>5.2</td>
<td>25.0</td>
</tr>
<tr>
<td>Paranoid</td>
<td>10.5</td>
<td>5.2</td>
<td>25.0</td>
</tr>
<tr>
<td>Thought Disorder*</td>
<td>7.9</td>
<td>5.3</td>
<td>25.0</td>
</tr>
<tr>
<td>Schizotypal</td>
<td>7.9</td>
<td>2.6</td>
<td>12.5</td>
</tr>
<tr>
<td>Self-Defeating</td>
<td>5.3</td>
<td>2.6</td>
<td>12.5</td>
</tr>
<tr>
<td>Alcohol Dependence</td>
<td>5.3</td>
<td>2.6</td>
<td>12.5</td>
</tr>
</tbody>
</table>

** P<.01
* p<.05
Table 10
Rates of Physical Health Conditions Co-Occurring With C-DIS-R PTSD (N=38)

<table>
<thead>
<tr>
<th>Health Condition</th>
<th>Prevalence in Sample (%)</th>
<th>Joint Prevalence with PTSD in Total Sample (%)</th>
<th>Percentage of PTSD Subjects with Diagnosis (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back Pain</td>
<td>34.2</td>
<td>10.5</td>
<td>50.0</td>
</tr>
<tr>
<td>Allergies</td>
<td>29.0</td>
<td>7.9</td>
<td>37.5</td>
</tr>
<tr>
<td>Headaches</td>
<td>23.7</td>
<td>7.9</td>
<td>37.5</td>
</tr>
<tr>
<td>Gastrointestinal Problems**</td>
<td>15.8</td>
<td>10.5</td>
<td>50.0</td>
</tr>
<tr>
<td>Fatigue*</td>
<td>13.2</td>
<td>7.9</td>
<td>37.5</td>
</tr>
<tr>
<td>Weight Loss*</td>
<td>13.2</td>
<td>7.9</td>
<td>37.5</td>
</tr>
<tr>
<td>Arthritis</td>
<td>7.9</td>
<td>2.6</td>
<td>12.5</td>
</tr>
<tr>
<td>Sexual Dysfunction</td>
<td>5.3</td>
<td>2.6</td>
<td>12.5</td>
</tr>
<tr>
<td>Seizures</td>
<td>5.3</td>
<td>2.6</td>
<td>12.5</td>
</tr>
<tr>
<td>Ulcer</td>
<td>5.3</td>
<td>2.6</td>
<td>12.5</td>
</tr>
<tr>
<td>Chronic Pain*</td>
<td>2.6</td>
<td>2.6</td>
<td>12.5</td>
</tr>
</tbody>
</table>

** p<.01  
* p<.05

Additionally, MCMI-III PTSD was significantly related to many of the other MCMI-III scales. Six of the 11 Personality Disorders assessed by the MCMI-III were found to be statistically more likely to occur among PTSD-positive subjects versus PTSD-negative subjects. These personality disorders were as follows: schizoid (x²=3.883, df=1, p=.0488), dependent (x²=3.883, df=1, p=.0488), depressive (x²=6.802, df=1, p=.0091), aggressive-sadistic (x²=4.201, df=1, p=.0404), passive-aggressive (x²=6.513, df=1, p=.0107), and self-defeating (x²=6.802, df=1,
Histrionic ($x^2=5.393$, df=1, $p=.0202$) and narcissistic ($x^2=6.156$, df=1, $p=.0131$) personality disorder were also significantly related to MCMI-III PTSD, but the direction of the relationship was such that PTSD-negative subjects were more likely to meet criteria for the disorders than PTSD-positive subjects. Additionally, MCMI-III PTSD-positive subjects were significantly more likely to have the following MCMI-III clinical syndromes: anxiety ($x^2=20.601$, df=1, $p=.0001$), somatoform ($x^2=7.283$, df=1, $p=.007$), bipolar-manic ($x^2=3.883$, df=1, $p=.0488$), dysthymia ($x^2=6.802$, df=1, $p=.0091$). Only one MCMI-III severe syndrome, thought disorder ($x^2=10.495$, df=1, $p=.0012$), was significantly related to MCMI-III PTSD. This relationship also indicated that PTSD-positive subjects were at greater chance for the disorder than those without PTSD.

MCMI-III PTSD was also found to be significantly related to several physical health conditions. See Table 11 for a summary of the physical health conditions that co-occurred with MCMI-III PTSD. All of the following conditions were more likely to have been present in PTSD-positive subjects: fatigue ($x^2=4.201$, df=1, $p=.0404$), weight loss ($x^2=4.201$, df=1, $p=.0404$), arthritis ($x^2=10.50$, df=1, $p=.0012$).

Table 12 represents the mean number of psychological and physical health comorbid conditions in the total sample and PTSD-positive and PTSD-negative subjects (as assessed by both the C-DIS-R and MCMI-III). "Axis I" comorbidity refers to all diagnoses on the C-DIS-R, "Axis II" comorbidity refers to only diagnoses on the Personality Disorder scales of the MCMI-III, while "MCMI-III" comorbidity refers to all scales on the instrument, and "Physical Health" comorbidity refers to diagnoses from the Physical Health Questionnaire. As shown in Table 12, subjects with PTSD on the MCMI-III had the greatest number of Axis I, Axis II, MCMI-III, and physical health comorbid conditions compared to any of the other reference groups. Further, while MCMI-III PTSD-positive subjects had higher mean number of Axis I, Axis II,
Table 11
Rates of Physical Health Conditions Co-Occurring With MCMI-III PTSD (N=38)

<table>
<thead>
<tr>
<th>Health Condition</th>
<th>Prevalence in Sample (%)</th>
<th>Joint Prevalence with PTSD in Total Sample (%)</th>
<th>Percentage of PTSD Subjects with Diagnosis (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back Pain</td>
<td>34.2</td>
<td>7.9</td>
<td>33.3</td>
</tr>
<tr>
<td>Allergies</td>
<td>29.0</td>
<td>10.5</td>
<td>44.4</td>
</tr>
<tr>
<td>Headaches</td>
<td>23.7</td>
<td>10.5</td>
<td>44.4</td>
</tr>
<tr>
<td>Gastrointestinal Problems</td>
<td>15.8</td>
<td>5.2</td>
<td>22.2</td>
</tr>
<tr>
<td>Fatigue*</td>
<td>13.2</td>
<td>7.9</td>
<td>33.3</td>
</tr>
<tr>
<td>Weight Loss*</td>
<td>13.2</td>
<td>7.9</td>
<td>33.3</td>
</tr>
<tr>
<td>Arthritis**</td>
<td>7.9</td>
<td>7.9</td>
<td>33.3</td>
</tr>
<tr>
<td>Seizures</td>
<td>5.3</td>
<td>2.6</td>
<td>11.1</td>
</tr>
<tr>
<td>Ulcer</td>
<td>5.3</td>
<td>2.6</td>
<td>11.1</td>
</tr>
<tr>
<td>Chronic Pain</td>
<td>2.6</td>
<td>2.6</td>
<td>11.1</td>
</tr>
<tr>
<td>Chest Pain</td>
<td>7.9</td>
<td>2.6</td>
<td>11.1</td>
</tr>
<tr>
<td>Skin Rashes</td>
<td>5.3</td>
<td>2.6</td>
<td>11.1</td>
</tr>
<tr>
<td>Other:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urinary Tract Infection</td>
<td>2.6</td>
<td>2.6</td>
<td>11.1</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>2.6</td>
<td>2.6</td>
<td>11.1</td>
</tr>
</tbody>
</table>

** p<.01
* p<.05

and physical health comorbid conditions than MCMI-III PTSD-negative subjects, this same trend did not occur with C-DIS-R PTSD-positive and negative subjects. Subjects who were positive for PTSD on the C-DIS-R had, on average, more Axis I and
physical health comorbid conditions, but fewer Axis II conditions than those who were negative for PTSD on the C-DIS-R.

Table 12

Psychological and Physical Health Comorbidity Rates Among C-DIS-R and MCMI-III PTSD+ and PTSD- Subjects (N=38)

<table>
<thead>
<tr>
<th>Total Sample</th>
<th>C-DIS-R</th>
<th>MCMI-III</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PTSD+</td>
<td>PTSD-</td>
</tr>
<tr>
<td>Axis I:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>x=2.16</td>
<td>x=3.75</td>
<td>x=1.73</td>
</tr>
<tr>
<td>sd=1.96</td>
<td>sd=2.18</td>
<td>sd=1.70</td>
</tr>
<tr>
<td>range=0-6</td>
<td>range=0-6</td>
<td>range=0-6</td>
</tr>
<tr>
<td>Axis II:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>x=3.24</td>
<td>x=2.75</td>
<td>x=3.10</td>
</tr>
<tr>
<td>sd=1.44</td>
<td>sd=0.87</td>
<td>sd=1.32</td>
</tr>
<tr>
<td>range=1-6</td>
<td>range=1-4</td>
<td>range=1-7</td>
</tr>
<tr>
<td>MCMII-III (All scales): x=4.5</td>
<td>x=3.86</td>
<td>x=4.0</td>
</tr>
<tr>
<td>sd=2.76</td>
<td>sd=1.96</td>
<td>sd=2.44</td>
</tr>
<tr>
<td>range=2-14</td>
<td>range=2-8</td>
<td>range=2-14</td>
</tr>
<tr>
<td>Physical Health: x=2.05</td>
<td>x=3.12</td>
<td>x=1.77</td>
</tr>
<tr>
<td>sd=1.68</td>
<td>sd=1.88</td>
<td>sd=1.52</td>
</tr>
<tr>
<td>range=0-6</td>
<td>range=1-6</td>
<td>range=0-6</td>
</tr>
</tbody>
</table>
DISCUSSION

This study assessed 38 actively employed law enforcement officers from the State of Michigan for PTSD and collateral psychological (Axis I and Axis II) and physical health conditions. Due to law enforcement work being associated with an increased risk for exposure to traumatic events, it was hypothesized that such an assessment would result in identifying a significant number of officers with PTSD. It was also the expectation that the proportion of subjects meeting full diagnostic criteria for PTSD would be greater than previously reported in the literature—an artifact of the rise in number of violent crimes since previous research was conducted. Using the C-DIS-R as the primary measure of PTSD in this sample, the first hypothesis proved to be accurate with 8 out of the 38 subjects (21%) receiving either lifetime and/or current diagnoses of PTSD. Although it is difficult to ascertain whether this rate of PTSD is statistically significant among this population, it is consistent with previous research which has found prevalence rates of PTSD in police officers following on-the-job traumas to range between 12% and 46% (Duckworth, 1991; Gersons, 1989; Martin, McKean, Veltkamp, 1986; Saathoff and Buckman, 1990). Hence, the second hypothesis was unproven since the observed rate of PTSD was in the middle of this range. As hypothesized, the type of traumatic events associated with consequent PTSD reactions were more often job related than non-job related (i.e. 62% to 38%, respectively).

As also speculated, PTSD (again using C-DIS-R as the diagnostic reference) was associated with an increased risk for psychological and physical health comorbidity in this sample, as evidenced by significant interactions with multiple Axis I, Axis II, and physical health conditions. All Axis I conditions found to be significantly related to
PTSD in this study (i.e. depressive disorders, somatoform pain disorder, and bipolar disorder) have been consistently reported as common collateral conditions of PTSD elsewhere despite sample differences [i.e. war veterans, general population, crime victims, victims of natural disaster] (Davidson et al., 1991; Green et al., 1992; Helzer, et. al., 1987; Keane & Wolfe, 1990). Being that comorbidity data on law enforcement officers per se is largely lacking in the literature, the present findings suggest that risk for Axis I comorbidity generalizes to this population as well. However, the officers who participated in this study do not reflect a random sample; thus, generalization to all police officers is not warranted. It is noteworthy that substance dependence (i.e. alcohol and nicotine), while highly prevalent in PTSD-positive subjects was not statistically significant. It may be the case that the use of alcohol and nicotine are common methods of coping with pressures of police work, and thus are behaviors likely to be found in this population in general regardless of PTSD. This sample appears to be dissimilar from other trauma populations, based on general findings on Axis I comorbidity reported in the literature, in that no cases of simple phobia, generalized anxiety disorder, dysthymia, or obsessive-compulsive disorder were detected.

When using the C-DIS-R as the diagnostic reference for PTSD, the risk for Axis II comorbidity is not as pronounced as when employing MCMI-III PTSD. While several personality disorders (i.e. avoidant, narcissistic, histrionic, compulsive, schizoid, dependent) were highly prevalent among PTSD-positive subjects, only aggressive-sadistic personality disorder was significantly more likely to co-occur among C-DIS-R PTSD-positive versus PTSD-negative subjects. Due to the fact that the nature of the traumas triggering associated PTSD in this sample were all relatively discrete events, personality characteristics may not have been as adversely effected as if they had been repetitive events. However, this explanation implies a causal direction
between PTSD and personality disorders which in reality can not be predicted from the present results. It may merely be the case that those with aggressive-sadistic tendencies are more prone to developing PTSD when faced with extraordinary traumatic events.

In contrast, when using MCMI-III PTSD as the reference point, the number of significantly related Axis II conditions rises dramatically (i.e. schizoid, dependent, depressive, aggressive-sadistic, passive-aggressive, self-defeating, histrionic, and narcissistic). Perhaps this is due, in part, to the symptom overlap between PTSD and these other disorders on this instrument. Interestingly, both C-DIS-R and MCMI-II PTSD had significant interactions with aggressive-sadistic personality disorder. This finding may have important implications for the clinical treatment of PTSD in this population since it has been suggested that Axis II comorbidity may negatively impact treatment outcome (Southwick, Yehuda, & Giller, 1993; Horowitz et al., 1980). In addition, it bears mentioning that the direction of the interaction between histrionic and narcissistic personality disorders and MCMI-III PTSD is reversed from all other significant interactions- meaning that those with PTSD were less likely to have these two disorders.

In terms of physical health comorbidity, PTSD was significantly related to fatigue and weight loss regardless of whether the disorder was assessed by the C-DIS-R or MCMI-III. These findings are consistent with previous studies examining the consequences of PTSD on health in a variety of trauma populations (Bleich, Uranso, 1990, Davidson et al., 1991; Shalev, Sutker et al. 1991). So, too, is the increased frequency of gastrointestinal problems and chronic pain among PTSD-positive subjects as assessed by the C-DIS-R. Yet caution should be taken when interpreting these results since PTSD-positive subjects also had higher rates of alcohol and cannabis use, which may play a mediating role in these significant interactions. The tendency for PTSD-positive subjects to have more adverse health practices was
similar to previous findings (Shalev et al., 1990; Soloman & Mikulincer, 1987; Soloman et al., 1987). The present findings did not support Blanchard's (1990) notion that PTSD is linked to hypertension.

This study was also intended to provide information on the reliability of the screener, C-DIS-R, and MCMI-III as assessment instruments for PTSD. Results indicate that the screening questionnaire had a tendency to overestimate the rate of PTSD in this sample compared to the C-DIS-R and MCMI-III (21 cases versus 8 and 9, respectively). Keeping in mind that the scoring criteria for the screener were less stringent than DSM-IV criteria- on grounds that sub-threshold levels of PTSD may be clinically significant and thus, worthy of inclusion- the predictive validity of this instrument should not be discredited. Although it appears that the diagnostic reliability across the C-DIS-R and MCMI-III is quite good, the diagnostic agreement between these instruments is actually only 41% (i.e. agreement on 5 subjects, disagreement on 7). However, examination of the C-DIS-R PTSD Ratio scores for the four subjects included by the MCMI-III yet excluded by the C-DIS-R, demonstrates that all were .75, with the exception of one subject who had a score of .50. Thus, these four subjects all had sub-threshold levels of PTSD on the C-DIS. Accordingly, the correlation between C-DIS-R PTSD Ratio and MCMI-III PTSD (raw scores) was $r= .572$, indicating moderate reliability between the two instruments.

Overall, this study supports previous research which has found PTSD to be associated with an increased risk for psychological and physical health comorbidity. While the majority of literature in this area has focused on combat traumatization, the present results suggest that the risk for psychological and physical health comorbidity may generalize to law enforcement officers with lifetime and/or current diagnoses of PTSD as well.
Limitations

Although the present findings are a starting point for describing and understanding the clinical picture of PTSD and comorbidity among law enforcement officers, there are several limitations with this study that future research should address. One limitation is the small sample size. Even though a sample size of 38 is comparable to previous descriptive studies with police offices (typical range in sample size is 26-53), it affects the power of the analyses run. Larger samples would allow for greater power and fewer type I errors.

Another limitation is the manner in which subjects were obtained. Because subjects were not randomly selected, the present sample may not be a representative sample of law enforcement officers in general. For example, there could be participation bias factoring into the results. As a result of slowly changing beliefs in the police culture that disclosure of emotional difficulties is a sign of weakness, it may be the case that those officers most likely to be suffering from PTSD were the least likely to participate in the study. In other words, the results may underestimate the true rate of PTSD and associated psychological and physical health comorbidity in this population.

Another possible limitation to the study is that all measures used relied on self-report methods. While self-report is critical in obtaining descriptive information, it could be argued that the results are skewed by the degree to which officers were being honest. However, two observations contraindicate this criticism. First, many officers showed signs of emotional reactivity (i.e. cried or became tearful) when discussing past traumatic experiences during the follow-up interviews and several officers disclosed highly sensitive information which could be damaging to their careers and personal relationships (i.e. alcohol abuse, drug use, physical violence, extra-marital affairs).
Secondly, on the physical health questionnaire 84% of subjects who endorsed physical symptoms reported receiving a physician diagnosis for at least one medical condition, which suggests that a good deal of their health complaints were objectively validated. Taking both of these two factors into account, the primary investigator believes that officers were being frank with their responses.

Recommendations

Even though law enforcement officers are a difficult population to engage in psychological research, the present results suggest that further examination of the associated risks to PTSD is warranted. Replication with larger sample sizes and greater gender diversity is recommended. It would be interesting to assess female officers to determine if the same PTSD patterns hold true across gender. Additionally, it would be beneficial to examine the age of onset of PTSD and collateral conditions in future samples in effort to gain insight on the temporal sequencing of comorbid conditions in relation to PTSD. Furthermore, treatment studies are encouraged with this population, as well as other human care service providers who are routinely exposed to traumatic events (i.e. firefighters, emergency medical technicians, emergency room nurses and doctors, etc.). With knowledge that PTSD is associated with an increased risk for psychological and physical health comorbidity, more research needs to begin looking at the impact of comorbidity on treatment outcome. Additionally, it would be helpful to gain insight into whether comorbid conditions remit when treatment for PTSD is administered. This type of research would be beneficial because it has the potential for providing a better understanding of the causation between PTSD and collateral conditions.
Appendix A

DSM-IV Diagnostic Criteria for Post-traumatic Stress Disorder
DSM-IV Diagnostic Criteria for Post-traumatic Stress Disorder (Adults)

A. The person has been exposed to a traumatic event in which both of the following were present:
   1. the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others
   2. the person's response involved intense fear, helplessness, or horror

B. The traumatic event is persistently re-experienced in one (or more) of the following ways:
   1. recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions
   2. recurrent distressing dreams of the event
   3. acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and dissociative flashback episodes, including those that occur on awakening or when intoxicated)
   4. intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event
   5. physiological reactivity on exposure to internal or external cues that symbolize or resemble as aspect of the traumatic event

C. Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three (or more) of the following:

   1. efforts to avoid thoughts, feelings, or conversations associated with the trauma
   2. efforts to avoid activities, places, or people that arouse recollections of the trauma
   3. inability to recall an important aspect of the trauma
   4. markedly diminished interest or participation in significant activities
   5. feeling of detachment or estrangement from others
   6. restricted range of affect (e.g. unable to have loving feelings)
   7. sense of a foreshortened future (e.g. does not expect to have a career, marriage, children, or a normal life span)

D. Persistent symptoms of increased arousal (not present before the trauma), as indicated by two (or more) of the following:

   1. difficulty falling or staying asleep
   2. irritability or outbursts of anger
   3. difficulty concentrating
   4. hypervigilance
   5. exaggerated startle response

E. Duration of the disturbance (symptoms in Criteria B, C, D) is more than 1 month

F. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning
Appendix B

Traumatic Stress Questionnaire
Traumatic Stress Questionnaire

Instructions:
Please do not put your name on this questionnaire, use the code # from the upper right-hand corner of your consent form. Answer the questions as accurately and honestly as possible - your answers will remain confidential. Your time is greatly appreciated.

PART 1

Below is a list of some traumatic events or situations which often cause people concern or distress. Have you ever experienced any of these traumatic stressors in your personal life? If so, please place a check mark (✓) next to any that apply to you. If you have experienced a traumatic event/situation which is not listed below, please check one of the "other" options.

- Victim of a violent crime
- Victim of sexual assault
- Victim of a serious motor vehicle accident
- Victim of a natural disaster
- Victim of an accident in the home
- Victim of an accident at work
- War combat
- Other event/situation, but can not say what
- Other event/situation
- N/A (Never experienced a traumatic event/situation in my personal life)

Below is a list of some traumatic events or situations which often cause law enforcement officers concern or distress. Have you ever experienced/witnessed any of these traumatic stressors while on the job? If so, please place a check mark (✓) next to any that apply to you. If you have experienced a traumatic event/situation which is not listed below, please check one of the "other" options.

- Homicide death
- Suicide death
- Serious motor vehicle accident
- Child death
- Serious personal injury (of another)
- Shot someone with your firearm
- Been shot at or shot (yourself)
- Physically attacked with harm done (yourself)
- Other event/situation, but can not say what
- Other event/situation
- N/A (Never experienced a traumatic event/situation while on the job)

Instructions:
◊ If you checked one or more items listed above (excluding N/A), please turn to the next page and continue »»».

◊ If you checked N/A for both sections listed above, you may stop and turn-in/mail-in your questionnaire. THANK YOU FOR YOUR TIME!!
Traumatic Stress Questionnaire - Continued

Instructions:
If you checked more than one traumatic event/situation on page 1, please choose the one traumatic stressor that caused you the most concern or distress and answer questions in Part 2, 3, and 4 with respect to that traumatic stressor only.

PART 2
You experienced or witnessed something frightening. AFTER the event or situation occurred: (please ✓ box if applies)

1. Did you avoid activities associated with the event? [ ]
2. Did you feel angry? [ ]
3. Did it interfere with your ability to perform at work? [ ]
4. Was your temper short with family members? [ ]
5. Did your emotional state change without warning? [ ]
6. Did you have trouble in remembering things? [ ]
7. Did you stay away from social gatherings? [ ]
8. Did you lose trust in other people? [ ]
9. Did you feel afraid or helpless? [ ]
10. Did you try to avoid thinking about what happened? [ ]
11. Did you question whether or not life was worth living? [ ]
12. Did you experience nightmares about what happened? [ ]
13. Were there times when you didn't know what to do next? [ ]
14. Did you have difficulty in sleeping through the night? [ ]

(Please continue on next page)
### Traumatic Stress Questionnaire - Continued

<table>
<thead>
<tr>
<th>Question</th>
<th>Not Very Bothersome</th>
<th>Extremely Bothersome</th>
<th>Weeks</th>
<th>Months</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. Did you feel &quot;numb&quot; or unable to relate to other people?</td>
<td>0 1 2 3 4 5</td>
<td>6 7 8 9 10</td>
<td>1 2 3</td>
<td>4 5 6 7</td>
<td>8 9 10 11</td>
</tr>
<tr>
<td>16. Were you afraid to return to the place where it occurred?</td>
<td>0 1 2 3 4 5</td>
<td>6 7 8 9 10</td>
<td>1 2 3</td>
<td>4 5 6 7</td>
<td>8 9 10 11</td>
</tr>
<tr>
<td>17. Was your temper short with people at work?</td>
<td>0 1 2 3 4 5</td>
<td>6 7 8 9 10</td>
<td>1 2 3</td>
<td>4 5 6 7</td>
<td>8 9 10 11</td>
</tr>
<tr>
<td>18. Did you feel like crying when you thought about what happened?</td>
<td>0 1 2 3 4 5</td>
<td>6 7 8 9 10</td>
<td>1 2 3</td>
<td>4 5 6 7</td>
<td>8 9 10 11</td>
</tr>
<tr>
<td>19. Did your sexual desire decrease?</td>
<td>0 1 2 3 4 5</td>
<td>6 7 8 9 10</td>
<td>1 2 3</td>
<td>4 5 6 7</td>
<td>8 9 10 11</td>
</tr>
<tr>
<td>20. Did thoughts about what happened keep returning?</td>
<td>0 1 2 3 4 5</td>
<td>6 7 8 9 10</td>
<td>1 2 3</td>
<td>4 5 6 7</td>
<td>8 9 10 11</td>
</tr>
<tr>
<td>21. Did you feel that you must be on your guard?</td>
<td>0 1 2 3 4 5</td>
<td>6 7 8 9 10</td>
<td>1 2 3</td>
<td>4 5 6 7</td>
<td>8 9 10 11</td>
</tr>
<tr>
<td>22. Did it interfere with your social life or personal relationships?</td>
<td>0 1 2 3 4 5</td>
<td>6 7 8 9 10</td>
<td>1 2 3</td>
<td>4 5 6 7</td>
<td>8 9 10 11</td>
</tr>
<tr>
<td>23. Did you feel that others couldn't understand what it was like?</td>
<td>0 1 2 3 4 5</td>
<td>6 7 8 9 10</td>
<td>1 2 3</td>
<td>4 5 6 7</td>
<td>8 9 10 11</td>
</tr>
<tr>
<td>24. Were there times when you had trouble falling asleep?</td>
<td>0 1 2 3 4 5</td>
<td>6 7 8 9 10</td>
<td>1 2 3</td>
<td>4 5 6 7</td>
<td>8 9 10 11</td>
</tr>
<tr>
<td>25. Did you sometimes feel that it was happening again?</td>
<td>0 1 2 3 4 5</td>
<td>6 7 8 9 10</td>
<td>1 2 3</td>
<td>4 5 6 7</td>
<td>8 9 10 11</td>
</tr>
<tr>
<td>26. Did you have trouble in concentrating?</td>
<td>0 1 2 3 4 5</td>
<td>6 7 8 9 10</td>
<td>1 2 3</td>
<td>4 5 6 7</td>
<td>8 9 10 11</td>
</tr>
<tr>
<td>27. Were you easily startled or upset by things that reminded you of it?</td>
<td>0 1 2 3 4 5</td>
<td>6 7 8 9 10</td>
<td>1 2 3</td>
<td>4 5 6 7</td>
<td>8 9 10 11</td>
</tr>
<tr>
<td>28. Did you &quot;block&quot; when you tried to think about what happened?</td>
<td>0 1 2 3 4 5</td>
<td>6 7 8 9 10</td>
<td>1 2 3</td>
<td>4 5 6 7</td>
<td>8 9 10 11</td>
</tr>
</tbody>
</table>

You have now **completed** the questionnaire. Please **turn-in/mail-in** your questionnaire. **THANK YOU FOR YOUR TIME!!**
Appendix C

Physical Health Questionnaire
YOUR NAME WILL NOT APPEAR ON THIS QUESTIONNAIRE, SO PLEASE ANSWER AS HONESTLY AND ACCURATELY AS POSSIBLE. BE SURE TO ANSWER ALL 12 ITEMS COMPLETELY. THANK YOU FOR YOUR TIME!!

1) Have you ever suffered from any of the following health conditions or symptoms (please circle all that apply to you)?

2) To the best of your recollection, please indicate how long ago the condition(s) or symptom(s) developed (please circle the appropriate time length).

3) Also, how much distress has the condition(s) or symptom(s) caused you (please circle appropriate distress level).

<table>
<thead>
<tr>
<th>Conditions/ Symptoms</th>
<th>How long ago did this health issue develop?</th>
<th>Amount of distress it caused</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Weeks</td>
<td>Months</td>
</tr>
<tr>
<td>a. Headaches</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>b. Seizures</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>c. Neurological Problems</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>d. Back Pain</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>e. Gastrointestinal Problems</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>f. Ulcer</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>g. Hypertension</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>h. Diabetes</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>i. Heart Disease</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>j. Cancer</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>k. Allergies</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>l. Chest Pains</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>m. Fatigue</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>n. Stroke</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>o. Audiological Problems</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>p. Vision Problems</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>q. Weight Loss (unintentional)</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>r. Chronic Pain</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>s. Arthritis</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>t. Nausea</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>u. Skin Rashes</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>v. Asthma</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>w. Sexual dysfunction</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>x. Other (please specify):</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
</tbody>
</table>
4) If you circled any of the health issues above, how long did each condition and/or symptom persist? (Please circle the appropriate time length)

<table>
<thead>
<tr>
<th>Condition/Symptom</th>
<th>Weeks</th>
<th>Months</th>
<th>Years</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4</td>
<td>1 2 3 4 5 6 7 8 9 10 11</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td>Still present</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4</td>
<td>1 2 3 4 5 6 7 8 9 10 11</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td>Still present</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4</td>
<td>1 2 3 4 5 6 7 8 9 10 11</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td>Still present</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4</td>
<td>1 2 3 4 5 6 7 8 9 10 11</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td>Still present</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4</td>
<td>1 2 3 4 5 6 7 8 9 10 11</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td>Still present</td>
</tr>
</tbody>
</table>

5) Were any of these health conditions or symptoms diagnosed and/or treated by a physician?

YES  
NO  

6) If you answered YES to #5, which ones?

<table>
<thead>
<tr>
<th>Condition/Symptom</th>
<th>Approximate Date of Diagnosis (month &amp; year):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7) Were any of the above health conditions or symptoms related to the traumatic stressor(s) you experienced?

YES  
NO  
NOT SURE  

8) If you answered YES to #7, which ones?

<table>
<thead>
<tr>
<th>Condition/Symptom:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
9) Do you currently smoke?
   YES ______
   NO, but I used to ______
   NO, I have never been a smoker ______

10) If you currently smoke/ used to smoke, how long have/did you smoke and how many packs a day do/did you smoke?
   Length of time smoking ___________
   Number of packs per day ___________

11) Do you consume alcohol?
    YES ______
    NO, but I used to ______
    NO ______

12) If you currently consume alcohol/ used to consume alcohol, how often do/did you?
    Less than once a month ___________
    Once a month ___________
    Several times a month ___________
    Once a week ___________
    Several times a week ___________
    Every day ___________
    Other (please specify) ___________

Code #: __________
Date: __________
Appendix D

Phone Script for Recruitment
Phone Script for Recruitment

(Researcher): Hello. My name is _____ and I am calling from the Psychology Department at Western Michigan University. Could you please tell me who I would speak with regarding the possibility of recruiting officers from your department for a study we are currently running at WMU, which is examining the effects of traumatic stress on the health of law enforcement officers? (GET NAME and DIRECT NUMBER).

(Researcher): Is he/she available at this time to speak with me?

   NO: Check for correct spelling of name, get direct number if available, get best time to call back, check to see if able to leave message for person

   YES: Ask to please be transferred

(Researcher): Hello. My name is _____ and I am calling from the Psychology Department at Western Michigan University. I am calling in regards to a study we're conducting at WMU which is aimed at examining the effects of traumatic stress on the mental and physical health of law enforcement officers. The study will be drawing its subjects from city and state police departments and county sheriff's departments within the State of Michigan. I'm calling to see if your department would be interested in serving as a recruitment site for the study? Would you be interested in finding out more about this study?

   NO: May I ask why you wouldn't be interested?
      NO: Well, thank you for your time.
      YES: (LISTEN). Well, thank you anyway. I appreciate your time.

   MAYBE or YES: Agreeing to participate as a recruitment site for the study would mean that your department is willing to allow a researcher to visit the department and allocate time for the researcher to introduce the study to officers and solicit volunteers (approximately 15 minutes at the beginning of multiple shifts). Officers volunteering to be in the study would be asked to sign a consent form and 10-minute questionnaire on traumatic stress and its consequent effects. Officers who complete and return a consent form and questionnaire will also be agreeing to complete a one-on-one, 2 hour, follow-up interview to be scheduled for a later date (on the officers' own time). As many subjects as possible will be followed-up on. Should 15 minutes be too great amount of time to ask, we could alternatively take only 5 minutes (at the beginning of multiple shifts) to explain the study and then leave forms for interested officers to complete on their own time and return by mail (pre-addressed and stamped envelopes provided). Officers' participation is strictly voluntary. Thus, during recruitment visits it will be made clear that participation is not department sponsored (i.e. voluntary) and no monetary compensation will be given by the department for participation. Likewise, participation is confidential. That means that department supervisors would not be privy to individual data collected. However, at the end of the study an aggregate report (summary of findings across all departments involved) would be made available to participating departments. Yet participating departments and officers would not be named in this report. Does the study sound like something your department would be willing to serve as a recruitment site for?
NO: Would you want to share the reason(s) for not participating?
   NO: Thank you for your time.
   YES: (LISTEN). Well, thank you for your time.
YES: At this point I would like to set up a (30 minute) meeting with you to further
discuss the study, answer any questions that you may have, and finalize recruitment
approval. Would this be possible?
   NO: Would it be possible then to send you further information and finalize
recruitment approval by mail? (SEND INFORMATION or THANK PERSON
FOR TIME)

YES: (ARRANGE TIME). Thanks for your time, I look forward to meeting
with you ________.

MAYBE, NEED MORE INFORMATION: We could arrange a (30 minute) meeting to
discuss the study in more detail. Would you be willing to meet?
NO: Alternatively, I could send you information on the study. Would you like
more information sent? (SEND INFORMATION or THANK PERSON FOR
TIME)

YES: (ARRANGE TIME). Thanks for your time, I look forward to meeting
with you ________. 
Appendix E

Departmental Recruitment Approval
Departmental Recruitment Approval

I _________________________ (Print Name) ___________________________ (Title) have approved Terri Belville to recruit subjects for her Master's Thesis study entitled "Traumatic stress: Effects on psychological and physical health comorbidity among law enforcement officers" at

_____________________________ (Department Name)

located at

_____________________________ (Department Address)

I understand that Terri Belville is recruiting law enforcement officers to participate in a research project exploring the effects of traumatic stress on psychological and physical health. I am aware that she will be utilizing approximately 10 minutes of roll call time to introduce her study and recruit potential subjects. I further understand that officers' participation is strictly voluntary (i.e. will not be monetarily compensated for by the department or Terri Belville) and entirely confidential. I am aware that I will receive a summary report of the study's findings once the study is completed, but will not be privy to individual data collected from my department or any others. My signature on this consent form indicates that I have read and understand the information presented above. Any questions I have may be directed to Terri Belville at (616) 387-4332 or Dr. Richard Spates at (616) 387-4329.

_____________________________ (Signature) ___________________________ (Date)
Appendix F

Departmental Recruitment Letter
Dear XXX:

I am a Clinical Psychology graduate student, at Western Michigan University, currently conducting a Master's Thesis project involving law enforcement officers entitled "Traumatic Stress: Effects on psychological and physical health of law enforcement officers." As represented in the title, I am interested in examining how traumatic stressors impact the overall health of law enforcement officers. Subjects for the study are being recruited through city, state, and county sheriff's departments within the State of Michigan. The purpose of this letter is to provide you with basic information about the study and to invite your department to participate in the study.

Should your department be interested in serving as a recruitment site for the study, participation would entail allowing myself, or a trained research assistant, to visit your department to introduce the study to officers and solicit volunteers. This would take approximately 15 minutes: 5 minutes to introduce the study and 10 minutes for interested officers to participate. Optimally these recruitment visits would be scheduled to take place prior to shifts beginning or immediately following; however, I am more than willing to work within the time limits most convenient for your department.

Officers volunteering for the study would be asked to sign a consent form and complete a 10-minute questionnaire on traumatic stress and its consequent effects. Officers who complete and return these materials would also be agreeing to be contacted for a follow-up interview. This one-on-one follow-up interview would take approximately 2 hours and would be scheduled to take place on officers' own time (not work time). Interviews will take place at a mutually agreed upon location between the subject and interviewer. The study will be following up with as many officers as possible.

Subject participation would be strictly voluntary (i.e. no monetary compensation provided by the department or myself) and confidential. In effort to protect subject confidentiality and to promote officer participation, departmental supervisors will not be privy to individual data collected from subjects. However, at the end of the study an aggregate report (i.e. brief summary of findings across all departments involved) would be made available to participating departments. This report will not include names of participating departments or officers.

Again, I welcome your department's involvement in the study. I will follow-up on this letter with a phone contact in the near future. If you would like to discuss the possibility of your department participating before my follow-up call or should you need further information on the study, please feel free to contact me at (616) 373-4241.

Sincerely,

Terri L. Belville
Clinical Psychology Doctoral Student, WMU
Appendix G
Recruitment Script
Recruitment Script

I. Introduce myself:
   A. Name
   B. Clinical Psychology Graduate Student at WMU, currently working on my Master's Thesis (from the Doctoral program)
   C. Background in behavioral medicine, personal interest in criminal justice

II. Introduce study:
   A. Here to recruit subjects for my research on traumatic stress; more specifically, I am interested in learning about traumatic stress and how it affects the health of law enforcement officers (i.e. mental and physical health)
   B. This research is independent of your department, and participation would be voluntary and on your own time (i.e. not overtime/ no work pay)
   C. Because this research is independent of your department, all information will be confidential. Therefore, your department will not have access to the data I collect.
   D. Participating departments will receive a final brief summary of the research findings, however neither the departments (study will include departments from all over Michigan) or officers involved will be identified in this summary report. Thus, the confidentiality of officers will be respected.
   E. My visit today is to inform you of the study and to recruit interested officers.

III. Participation Requirements:

   A. Volunteering to be in the study means that you will be asked to:
      1) Complete a 10 minute questionnaire on traumatic stress and its effects on your mental and physical health (done today); and may be asked to
      2) Complete a one-on-one, 2 hour follow-up interview (you will be called and the interview will be scheduled for a latter date; hopefully within a 2 week period, but I will work around your schedule)
         a) I will try to schedule follow-up interviews with as many officers as possible, however, there is a chance that you may not be contacted for a follow-up interview
         b) Interviews will be conducted at a mutually agreed upon location (i.e. worksite or other location)

IV. Procedures:

   A. Explain consent form. If you are interested in participating in the study, there is a consent form that needs to be read and signed before completing the 10 minute questionnaire. The consent form is protect you- it spells out what is expected from you and what you can expect by being in the study.
   It states that your participation is voluntary and confidential.
   B. Pass out consent forms and screening questionnaires (Alternative: Also pass out the self-addressed and stamped envelopes)
   C. Please look over the consent form and questionnaire.
   D. If you want to participate:
      1. Read and sign the consent form first.
a) You will notice the consent form asks for identifying information. This will be used only to call you to schedule the follow-up interview. All other instruments you complete will not ask for such information. Instead you will be identified by a code number (i.e. last four digits of your social security number) rather than your name- this is to protect confidentiality.

2. Next, read and complete the questionnaire.

3. Turn both in on your way out. (Alternative: Mail them back once completed, in the self-addressed and stamped envelopes provided)
   a) Remember that by turning in both the signed consent form and completed questionnaire you are agreeing to participate in a follow-up interview as well, should you be contacted.

E. If you choose not to participate:
   1. You may hand in your forms on your way out or
   2. Leave the forms on the desk and I will collect them (i.e. I recycle them)

F. Questions?

G. Thank everyone for their time
Appendix H
Demographic Questionnaire
Demographic Questionnaire

PLEASE ANSWER THE FOLLOWING QUESTIONS. YOUR NAME WILL NOT APPEAR ON THIS FORM SO PLEASE RESPOND AS HONESTLY AND ACCURATELY AS POSSIBLE. YOUR TIME IS GREATLY APPRECIATED.

1. Age: __________

2. Sex:
   Male ______  Female ______

3. Race:
   African American ______  Caucasian ______  Hispanic ______
   Native American ______  Asian ______  Other/(Specify) ______

4. Marital Status:
   Married ______  Divorced/Separated ______
   Widowed ______  Never Married/Single ______

5. Annual Income:
   Less than $5,000/yr ______  $5,000-$20,000/yr ______
   $21,000-$35,000/yr ______  $36,000-$50,000/yr ______
   $51,000-$75,000/yr ______  $76,000+/yr ______

6. Highest Level of Education Completed:
   High School ______  Technical Degree ______
   Associates Degree ______  Bachelors Degree ______
   Masters Degree ______  Advanced College Degree ______

7. How many years have you served in law enforcement?
   ________/Months  ________/Years

8. How many years have you been employed by your current department?
   ________/Months  ________/Years

9. Current job title:
   Road Patrol ______  Detective ______  Sergeant ______
   Lieutenant ______  Deputy ______  Undersheriff ______
   Sheriff ______  Chief ______  Other (please specify): ______

10. Place of employment:
    City/Township Police Dept. ______  County Sheriff's Dept. ______
    State Police Dept. ______  Other (please specify): ______
Appendix I

Consent for Publication or Presentation of Identifiable Data
Western Michigan University
Department of Psychology
Principal Investigator: Richard Spates, Ph.D.
Student Investigator: Terri Belville

I, __________________________, understand that the results of Terri Belville's Master's Thesis project entitled "Traumatic Stress: Effects on psychological and physical health of law enforcement officers" may be submitted for professional publication or presented at a professional conference. I am aware that the results published or presented would not identify individual participating departments or law enforcement officers by name; but will describe the data, including a categorized summary of the "types" of traumatic stressors reported by subjects. I agree that my data may be used anonymously in a summary of this sort, and I am aware of the associated risk of being linked to the published or presented results should my data be rare or unique enough to identify me despite being anonymous. My signature on this document indicates that in light of the above risk, I consent to Terri Belville including my data in the results which she may submit for professional publication or presentation. Any questions or concerns I have regarding this matter may be directed to Terri Belville at (616) 373-4332, Dr. Richard Spates at (616) 387-4329, or the Vice President for Research at Western Michigan University at (616) 387-8298.

_________________________  _______________________
(Signature)                 (Date)
Appendix J

Consent Form for Subject Participation
I have been invited to voluntarily participate in a research project entitled "Traumatic Stress: Effects on psychological and physical health of law enforcement officers." I understand that this research is intended to study how exposure to traumatic stress impacts the psychological and physical health of law enforcement officers. I further understand that this research is Terri Belville's Master's Thesis project and has been developed independently from my employer.

I understand that my participation in this study will include completing and returning a 10-15 minute questionnaire on traumatic stress. I am aware that this questionnaire will inquire about my experience with traumatic events/situations and the affect such experiences have had on me. I further realize that by returning this consent form (signed) along with a completed questionnaire I am agreeing to be contacted by phone for a one-on-one follow-up interview. However, if I have experienced a traumatic event within the past 30 days, I understand that I may be excluded from participating in a follow-up interview. I am aware that the researchers will follow-up with as many subjects as possible. I understand that the follow-up interview will last approximately two hours and will take place at a mutually agreed upon location between the interviewer and myself. I am aware that as part of the interview I will be asked to provide some general information about myself (i.e. age, marital status, level of education, employment status, etc.). In addition, I understand that I will be asked verbal questions about traumatic events/situations that I have experienced in the past and about my mental and physical health. I also understand that I will be asked to complete two questionnaires. One of these questionnaires will inquire about my physical health and the other will ask questions about how I cope with everyday experiences, over long periods of time.

I am aware that all information collected from me will be kept entirely confidential, except in the case that I pose a dangerous threat to myself or others. To facilitate confidentiality, I understand that a code number will be assigned to my name, which will then be used to identify all information relating to me (with the exception of this informed consent form which bears identifying information to be used solely to contact me for purposes of this research). I am aware that a master list which matches my name to the coded data will be kept in a secure location, separate from my data. All coded data, along with my consent form, will be kept in a locked filing cabinet in the Psychology Clinic (room 286B Wood Hall, Western Michigan University). Therefore, no one at my department will have access to (or be told about) my completed questionnaires or interview data. Once all data for the study is collected and analyzed, the master list of names and codes will be destroyed. I am aware that once this master list is destroyed no one will be able to trace the results of the study back to my participation. I understand that the data from this study will be retained for a minimum of three years in a locked file in the Psychology Clinic.
As in all research, there may be unforeseen risks to the participant. If an accidental injury occurs, appropriate emergency measures will be taken; however, no compensation or treatment will be made available to the subject except as otherwise stated in this consent form. I understand that one potential risk of participating in this study may be my emotional upset to the content of the initial questionnaire or interview. However, I am aware that I may refuse to participate or quit at any time during the study without prejudice or penalty. Furthermore, I understand that should I become emotionally distressed during the interview, the interviewer is prepared to terminate the interview and implement a relaxation exercise with me. Furthermore, I am aware that a mental health resource list will be made available to me. Should a referral be made, I understand that any treatment costs incurred are my responsibility. Another possible risk of participating in this research may be social ridicule from colleagues or political pressure from superiors. However, I understand that my participation is strictly voluntary and will be kept confidential.

One possible benefit of participating in this study may be the opportunity to discuss the traumatic event(s)/situation(s) I have experienced and share my related thoughts and feelings. I also am aware that by participating in this project I am contributing to the understanding of traumatic stress among law enforcement officers and that this knowledge may later benefit individuals exposed to traumatic stress (i.e. facilitate improved treatment).

If I have any questions or concerns about this study or my participation in it, I may contact either Terri Belville at (616) 387-4332 or Dr. Richard Spates at (616) 387-4329. I may also contact the Chair of the Human Subjects Institutional Review Board or the Vice President for Research at Western Michigan University (616) 387-8298 if questions or problems arise during the course of the study.

Signature ___________________________________________ Date

Name (Please Print)

Address ___________________________________________ City, State Zip

Phone number (Where you may be contacted) ___________________________ Best time to reach you ___________
Appendix K

Human Subjects Institutional Review Board Approval
Date: Feb 3, 1995
To: Belville, Terri
From: Richard Wright, Interim Chair
Re: HSIRB Project Number 94-11-36

This letter will serve as confirmation that your research project entitled "Traumatic stress: Effects on psychological and physical health of law enforcement officers" has been approved under the full category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note that you must seek specific approval for any changes in this design. You must also seek reapproval if the project extends beyond the termination date. In addition if there are any unanticipated adverse or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: Feb 3, 1996

xc: Spates, PSY
BIBLIOGRAPHY


