Post-traumatic stress disorder and violence:
selective processing of threat cues

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ABSTRACT

A study was conducted to examine the relationship between post-traumatic stress disorder (PTSD), violence and the selective processing of threat cues. It was predicted there would be a high level of PTSD among a male forensic population and that PTSD symptoms arising from violent trauma would be related to aggression. It was suggested that one mechanism that may provide a link between PTSD (based on violent trauma) and violence, is the selective processing of violent stimuli. An information-processing approach was used as the theoretical basis for the study and a Violent Stroop test was developed. Consistent with previous studies, a high level of trauma and PTSD was found among violent offenders. As predicted, levels of PTSD (based on violent victimisation) were significantly related to violent behaviour, whereas PTSD from non-violent events was not related to violent behaviour. Both PTSD symptoms from violent trauma and violent behaviour were significantly associated with Stroop interference for violent words. A number of possible co-variants were also examined. The results were discussed and a critical review of the study was given. Clinical implications and possibilities for future research were provided.
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1. INTRODUCTION

This study is interested in examining relationships between post-traumatic stress disorder (PTSD), violence and selective processing of threat stimuli. Although it is well established that many violent offenders have experienced high levels of trauma (e.g. Lewis, 1989), there is little research as regards the impact that post-traumatic stress reactions may have on violent behaviour. Of the studies of PTSD among offenders that have taken place, a relationship between violence and post-traumatic stress has been identified (Collins and Bailey, 1990). More research is required to explore this relationship further and understand the mechanisms that may link the two.

In a separate area of research, the study of combat veterans, investigators have increasingly found anger and aggression to be common problems among those with PTSD (a comprehensive review is provided by Beckham, Moore and Reynolds, 2000). This has led to the development of some theoretical models that address how PTSD might be related to violent behaviour (Chemtob, Roitblat, Hamada, Carlson and Twentyman, 1988; Chemtob, Novaco, Hamada, Gross and Smith, 1997). Such models that have helped to understand aggression in Vietnam veterans with PTSD may also be applicable to violent offenders who are traumatized. One mechanism common to PTSD and violence is the selective processing of threatening stimuli. Information-processing approaches to PTSD suggest that victims of trauma with symptoms of PTSD show biases in their attention to, and interpretation of, threat in the environment (e.g. Chemtob et al, 1988). Similar processes have been found to occur in individuals who are habitually aggressive (Dodge, Petit, Bates and Valente, 1995). The objective of this current research is to explore any relationship between PTSD, violent behaviour and the selective processing of threatening stimuli among violent offenders.

This introduction will firstly define and discuss key conceptual issues relating to PTSD and violence. A summary of the relevant research that has examined the relationship between trauma, PTSD and violence will be presented in further detail. Theoretical models of PTSD and violence will be described, with a focus on information-processing approaches. Experimental studies examining the selective processing of threat cues will then be reviewed. Lastly, the hypotheses for this piece of research will be presented.
1.1 Post-traumatic Stress Disorder (PTSD)

1.1.1 Diagnosis

Post-traumatic stress disorder is a relatively new diagnosis to be officially recognized. It entered the third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III, American Psychiatric Association) classification system in 1980 and since this time has been subject to increasing debate and research. However, the notion that individuals (or groups of individuals) may respond adversely to stressful, and in particular life-threatening events, is not a new one. A review of the history of trauma is provided by van der Kolk, Weisaeth and van der Hart (1996).

PTSD is classified as an anxiety disorder though some have argued that it is better categorized as a separate stress response category (Brett, 1993) or dissociative disorder (Brett, Spitzer and Williams, 1988). The first and critical component of PTSD is that a traumatic stressor must have occurred. The nature of what constitutes a trauma is subject to much discussion and conceptions of what events may be capable of eliciting PTSD reactions are often being revised (e.g. medical procedures – Shalev, Schreiber, Galai, and Melmed, 1993c; heart attacks – Kutz, Shabtai, Soloman, Neumann and David, 1994). In the original entry of PTSD into the DSM-III, the trauma (Criterion A) was defined as an event that was beyond the realm of normal human experience. This became increasingly problematic as research started to illustrate that traumatic experiences are not so infrequent (e.g. Norris, 1992). In DSM-IV (1994, American Psychiatric Association) Criterion A was changed to focus more on physical threat and include a subjective component. Thus a trauma is considered firstly to be an event that involves perceived or actual threat to the life or physical integrity of a person/s (through direct experience, witnessing or learning about it happening to someone close).

Secondly, it has to involve a subjective intense feeling of fear, horror or helplessness. This definition allows for individual variation in response to potentially stressful events. A potential shortcoming of this definition includes relying upon an individual reporting those events as subjectively frightening or horrific which may be perceived as shameful by certain individuals or within certain cultures (e.g. prison culture).
Symptoms of PTSD are clustered into three main categories: re-experiencing, avoidance and arousal. Re-experiencing symptoms include intrusive memories, flashbacks and nightmares. Avoidance symptoms include avoidance of thoughts, feelings and reminders of the trauma, emotional numbing and feelings of detachment from others. Arousal symptoms include hypervigilance and exaggerated startle responses. DSM-IV criteria states that the symptoms must have lasted for at least a month and that they must have impacted significantly on everyday functioning. Symptoms of PTSD may ensue immediately after an event or can develop a significant length of time after the event (delayed onset). In some cases this may be years after the original trauma. It is generally agreed that PTSD can be a chronic condition (Green et al, 1990; Kilpatrick et al, 1987).

Although PTSD is currently defined as a discrete category, there are increasing arguments for conceiving of stress reaction as a continuous variable, with degrees of distress (Joseph, Williams and Yule, 1997). Clinical experience and research would suggest that a number of individuals seen in therapy with significant clinical distress would not fulfill strict DSM-IV criteria for PTSD (Stein, Walker, Hazen and Forde, 1997). This has led to a number of authors arguing for a further category of partial PTSD (e.g. Carlier and Gersons, 1995). However, there have been a number of different ways in which partial PTSD has been defined. Blanchard, Hickling, Taylor, Loos and Gerardi (1994) define it as the minimum number of re-experiencing symptoms according to DSM-IV, plus either the minimum number of avoidance or arousal symptoms. Green (1994) and Kilpatrick and Resnick (1997) apply the stricter criteria of only reducing the minimum number of avoidance symptoms from three to two. Stein et al, (1997) define it as having at least one type of each symptom cluster present.

It would appear that the course of PTSD can be variable (Zeis and Dickman, 1989) and it may be that symptoms arise or become more extreme at times of stress, or when exposed to reminders. This highlights the possible limitation in using DSM-IV criteria for assessing PTSD where only the past month is focused upon.

The difficulties that people experience as a result of trauma often step outside the boundaries of PTSD diagnostic criteria. Associated problems (aside from anger and aggression) include substance misuse, mood and other anxiety problems, dissociative
experiences, and personality difficulties (Kulka, Schlenger, Fairbank, Hough, Jordon, Marmar and Weiss, 1990). The National Co-morbidity Study involving 8,098 participants, found that co-existing problems tend to be common in PTSD with 44% of women and 59% of men in their sample also meeting diagnostic criteria for at least three other psychiatric conditions (Kessler, Sonnega, Bromet, Hughes and Nelson, 1995). However, it has been argued that other psychiatric problems tend to be interlinked with PTSD symptoms as opposed to being strictly co-morbid (Deering, Glover, Ready, Eddleman and Alarcon, 1996).

Van der Kolk and McFarlane (1996) highlight the limitations of conceptualizing PTSD in terms of psychiatric diagnosis arguing that responses to trauma may affect people on biological, psychological, social, and spiritual levels. Focusing in on diagnostic criteria may result in the therapist overlooking other aspects of the individual’s life that has been affected. Yule (1999) also emphasizes the dilemma that on the one hand, given a sufficiently stressful event, PTSD may be viewed as a normal reaction yet it is also concurrently considered a serious psychiatric condition.

The difficulties with differentiating between normal and abnormal stress reactions are also highlighted by the recent addition to the DSM-IV (APA, 1994) of Acute Stress Disorder (ASD). This may be diagnosed if the individual is displaying symptoms of intrusion, avoidance, arousal and dissociation from 2 days to 4 weeks duration. As in PTSD, the symptoms must significantly interfere with everyday functioning in order for a diagnosis to be made. Again, this diagnosis has sparked some controversy with the argument that labelling acute reactions to stress as clinical may impede adjustment and that 2 days of significant distress is within normal limits of recovery. On the positive side, the inclusion of this diagnosis may generate further research and clinical work to help identify early indicators for chronic PTSD.

1.1.2 Epidemiology

Studies that estimate the level of trauma among populations are not necessarily straightforward. As was mentioned earlier, our conceptualization of the nature of trauma is often changing or being challenged. The National Co-morbidity Survey estimated trauma in the general population to be 26% (Kessler et al, 1995). Norris
(1992) reported that 69% of a sample of US adults had experienced a traumatic stressor. In a sample of college students, Vrana and Lauterbach (1994) found the level of trauma to be even higher at 84%.

Prevalence rates of PTSD may be explored either across the general population, or across survivors of specific traumas. In the National Co-morbidity Survey, Kessler et al (1995) found that lifetime rates of PTSD ranged from 5 to 14% and current rates were estimated at 2.8%. Breslau, Davis, Andreski and Peterson (1991) found a lifetime prevalence rate of 9.2% and a 23.6% rate of PTSD in those who had been exposed to trauma.

The study of specific traumatic events suggests that certain types are associated with greater psychological maladjustment than others. There may also be variations in the type of psychological response depending on the nature of the trauma. Rates of PTSD appear to be higher among those who have experienced trauma that involves interpersonal violence. For example, Kessler et al (1995) found that 65% of men and 46% of women who were rape victims experienced PTSD. Norris (1992) also found that sexual assault led to highest rates of PTSD. Kessler et al (1995) found that the events most closely linked to PTSD were rape and sexual assault in women and combat and witnessing death and serious injury in men. De Girolamo and McFarlane (1996) looked at prevalence rate of PTSD among victims of different types of violence and found them to be relatively high. Out of 21 studies, only 3 reported a prevalence rate of less than 25%.

1.1.3 Complex PTSD

Trauma purposefully inflicted by humans may engender more complex reactions involving issues of trust, power and oppression, secrecy, and disclosure. Violent victimization is also more likely to be experienced as an individual (unlike, for example, natural disasters where many are usually involved) resulting in less social support and possibly more self-blame. Certain traumas, such as sexual or physical abuse, may have a cumulative effect and occur over many occasions. This has led to some authors arguing for separating out the different type of traumatic stressors (Terr, 1991). Terr (1991) has distinguished between Type I and Type II trauma. Type I trauma, she argues, refers to the occurrence of a sudden and unexpected single event.
whereas Type II involves the prolonged and repeated exposure to trauma. While the two
types of trauma may both involve a set of core symptoms (repeatedly perceived
memories, repetitive behaviours, trauma-specific fears, and changed attitudes about
people, life and the future), Terr (1991) argues that Type II trauma may involve more
dissociation, numbing and denial symptoms used to cope with the anticipation of
prolonged trauma. Terr (1991) considers rage to be associated with Type II trauma.

A new category was set to enter the DSM-IV that would be termed Complex or
Complicated PTSD to cover the specific problems observed in those with long-standing
and repeated exposure to traumatic events. Unfortunately after much preparation it was
finally decided not to include it. The UK classification system ICD-10 (1993) has
included a category that somewhat covers this constellation of problems termed
“Enduring Personality Change After Catastrophic Experience”. As this last category
suggests, there is a complex and intimate relationship between PTSD and personality
(Williams, 1999). As Williams (1999) points out, the intricacies of this relationship
would ultimately lead to the assertion that personality style and post-traumatic reactions
would be inseparable. Research has increasingly implicated the role of childhood
trauma in the development of adult personality problems (e.g. Herman, Perry and van
der Kolk, 1989). Williams (1999) argues that personality change that may occur after
trauma in adulthood tends to mirror changes that can follow childhood trauma.

The importance of these arguments raised about complex PTSD and personality to the
current study, is that violent offenders with a diagnosis of personality disorder will be
used as the population where the relationship between PTSD and violence will be
examined (see Method Section). It is not the remit of the current study to address the
controversies surrounding the diagnosis of personality disorder. It is accepted that there
is a complex relationship between personality disorder and trauma, but these issues are
not the focus of this study.

1.2 Violence

A multitude of factors have been associated with aggressive behaviour and there is little
dispute that the development of violence is multiply determined. Factors involved in the
development of violence range from genetic, neurological and physiological influences;
to hostile attitudes, vicarious learning, cognitive difficulties and substance misuse; through to media influences, gangs, and availability of firearms. Violence is more likely to happen when a number of risk factors converge (Eron, 1982). Violence falls within the broader concept of aggression (Blackburn, 1995). However, the term aggression is often used to denote a variety of behaviours ranging from verbal abuse, attacking property, courtship in animals, competitive sports and sales techniques; right through to serious violent or homicidal behaviour (Baron and Richardson, 1994). The label of aggression is not only confined to behaviour, it is also sometimes used to describe motives, thoughts, attitudes and emotions. Due to the imprecise use of the term, psychologists working in the field of aggression have attempted to narrow the definition. Aggression is considered to be any form of behaviour directed toward the goal of harming or injuring another living being who is motivated to avoid such treatment (Berkowitz, 1993; Baron and Richardson, 1994; Blackburn, 1995). This definition stresses that it is a behaviour, that the motive is intentional and that the recipient is living and not wanting to be harmed. However, the injury or harm inflicted may be physical or psychological. Violence is when the intended harm or injury is physical (although the resulting consequence for the victim may be psychological). As Webster, Douglas, Eaves and Hart (1997) argue, the defining characteristic of violence is the act itself rather than the damage to the victim. For the purposes of this research, the terms 'violence' and 'aggression' will be used interchangeably but the focus is on the physical nature of aggressive behaviour. Consistent with the measurement tool used to operationalise violence in this study (HCR-20 – see Method Section), sexual assault will be considered as violent.

It is also relevant to discuss the notion of different types of violence. Distinctions have been made between hostile and instrumental aggression. Hostile violence is motivated simply by the expression of violence itself, and instrumental is used to describe the use of physical force to acquire non-aggressive goals, such as financial gain. However, some would argue against this distinction. For example, Bandura (1973) would consider both types of motivation to be instrumental. As a result, the terms aggression and violence will be used to refer to the intended harm regardless of the underlying motive. Two further distinctions should also be made. Violence and aggression is differentiated from anger, which is an emotional state. Anger does not necessarily lead to aggression and aggression is not always motivated by anger. Aggression is also different from
hostility. Hostility is an attitude or negative evaluation, characterised by feelings of hate and mistrust (Blackburn, 1995). Hostility may or may not underlie aggressive acts.

There are many difficulties encountered when attempting to study violence in terms of measuring the behaviour. Data can be self-report by the perpetrator, official statistics, behavioural as observed by others, or as reported by the victim. There are problems with all of these sources, as there is in the study of crime in general (e.g. see Hollin [1989] for a discussion of these issues). Many studies of violence use official offence data and categorise individuals according to violent versus non-violent offences. This often does not examine any aggressive behaviour that has not resulted in a conviction, current behaviour, time elapsed from offence and whether someone has addressed their offending behaviour or are motivated to change.

There are numerous problems involved in judging how violent someone is. Situational variables are important and the person's current state (having taken alcohol is a prime example) is clearly relevant to an act of violence. A one-off incident of violence does not necessarily define a person as having a violent nature. Nevertheless, if the individual act involved the brutal murder of another person, the perpetrator may well be considered seriously violent. Intensity, frequency and intent may all be important.

Blackburn (1995) argues that the class of disorder most associated with violence is psychopathic disorder (Mental Health Act 1983) and identifies the circularity of the definition for being termed as a "persistent disorder or disability of mind...which results in abnormally aggressive or seriously irresponsible conduct on the part of the person concerned" (Blackburn, 1995, p.357). Within the broad legal term of psychopathic disorder, individuals may be clinically diagnosed with a personality disorder. Again some of these labels also feature violence as a defining characteristic (namely antisocial personality disorder and borderline personality disorder). The high level of trauma encountered among this client group was reported upon earlier in the Introduction. As a forensic sample with a diagnosis of personality disorder have been previously been found to have both high levels of PTSD and violent behaviour (Kruppa, Hickey and Hubbard, 1995), they provide a suitable group within which to study the relationship between PTSD and violence (see Method Section).
Problems with violence tend to be predominantly male. Although women also display aggressive behaviour, there is major gender divide. Although this is an area worthy of further attention, it will not be addressed within the current study. The sample used for this research will be all male.

1.3 **PTSD and violence**

1.3.1 Trauma and violence

As noted earlier in Section 1.1, a basic and critical requirement for the development of PTSD is to have experienced a traumatic event. There may be several reasons why violent offenders may be more likely to have experienced traumatic life events than the normal population.

The first reason is that early trauma has been considered a common factor in the aetiology of chronic aggression (e.g. Lewis 1989). Perpetrators of violence are much more likely to have experienced physical abuse in childhood than the normal population (see review by Widom, 1989). The experience of physical abuse would normally fit the criteria for being considered a traumatic event. It involves physical threat and is often accompanied by feelings of fear, helplessness or horror. Although childhood abuse is neither a necessary nor sufficient cause of violent behaviour (Widom, 1989) the link between the two is profound. Many theories of aggression view the experience of childhood physical abuse as an important aspect in the development of chronic aggression (e.g Bandura, 1973). Theories to explain the “cycle of violence” or “intergenerational transmission of violence” tend to use social learning theory (Bandura, 1973). An aspect that has largely been ignored in this wide literature, with the notable exceptions of Hodge (1992; 1997) and Dutton (1995), is the possible role of PTSD symptoms. As a result, Dutton (1995) argues that social-learning theories of intergenerational transmission of violence may be incomplete. Citing evidence of PTSD-like profiles in chronically abusive men, Dutton (1995) postulates that such men report intermittent feelings of tension and irritability and that they appear to be responding to internal stimuli. This pattern, he argues would fit more with a PTSD model of violent responding than a social learning model that focuses more on
responses to external stimuli.

It could be argued that the relationship between physical abuse and aggression may not necessarily be a linear causative one and that children who are more challenging may be more likely to be hit. However, studies have taken place that have controlled for child temperament and still found the link between abuse and later violent behaviour (Dodge, Bates and Petit, 1990).

A second possible reason why violent people may have experienced trauma involves the lifestyle of the violent criminal. Violent offenders tend to have backgrounds of wider criminality, substance misuse and a delinquent peer group (West and Farrington, 1973; McMurran 1999). Living within the social context of criminality and substance misuse, witnessing or experiencing trauma may be more likely. Anti-social behavioural problems under the age of 15 have been associated with greater exposure to trauma (Helzer, Robbins and Envoy, 1987).

A third reason why a violent person may be prone to experiencing trauma is as a result of their own violent behaviour. In a survey of patients in a high security hospital, Kruppa et al (1995) found that among a group of violent offenders, 75% reported that their index offence was traumatic.

Finally, the experience of prison or institutions that house disturbed and/or dangerous individuals may also heighten the probability of being involved in potentially traumatic situations (Taylor, 1993).

1.3.2 PTSD among violent offenders

It is widely accepted that many violent offenders have experienced trauma (Lewis 1989; Boswell, 1995) and there is increasing evidence of substantial PTSD symptomology among forensic populations (Spitzer, Dudeck, Liss, Orlob, Gillner and Freyberger, 2001; Cauffman, Feldman, Waterman and Steiner, 1998; Gibson, Holt, Fondacaro, Tang, Powell and Turbitt, 1999; Steiner, Garcia, and Matthews, 1997; Kruppa, 1995).

Kruppa et al (1995) examined the prevalence of PTSD among a sample of 44 legal psychopaths in an English high secure hospital. Among this sample, all but one
participant had committed a violent offence. 22% of the sample fulfilled DSM-III R criteria for PTSD, and 41 out of 44 reported at least one traumatic event that was associated with some PTSD symptoms. Collins and Bailey (1990) found that in a sample of males in an American prison, the presence of post-traumatic stress was associated with higher levels of violence. Moreover, the temporal ordering of PTSD and violence indicated that the presence of PTSD preceded the perpetration of violent acts.

Silva, Leong, Gonzales and Ronan (1998) presented case studies of individuals with PTSD who were violent. In both cases, misidentification of individuals had occurred during traumatic flashbacks and had resulted in violent acts.

Dutton (1995) found that men who were wife assaulters had significantly higher PTSD symptoms than a demographically matched control group. Moreover, there was a significant association between the extent of PTSD symptoms among the men and levels of abuse perpetration by the men against their wives. The men with PTSD symptoms also experienced greater levels of chronic anger in situations wider than their domestic relationship. Dutton (1995) argued that aggression among male wife assaulters may serve the function of reducing the anxiety and dysphoric symptoms of PTSD.

Burton, Foy, Bwanausi, Johnson and Moore (1994) examined the occurrence of PTSD among juvenile offenders and found that approximately one quarter (24%) fitted DSM-III R criteria for PTSD. They also found that exposure to violent trauma was significantly correlated to PTSD. Although this sample was not specifically violent, 86% had used weapons and 53% had been arrested for two or more violent crimes.

1.3.3 Violence among those with PTSD

Other research examining the relationship between PTSD and violence has studied anger and aggression among populations known to have experienced trauma. Although it is not stated explicitly, the DSM-IV criteria indicate that people with PTSD may pose a greater risk to be violent. This is suggested by an item featured under arousal symptoms, that a person may suffer from outbursts of anger and irritability.

Studies of the effects of PTSD among children indicate that a consequence can be
heightened aggression (Pynoos et al 1985). In a study of child maltreatment among serious offenders, Boswell (1995) reported that there is increasing evidence that one of the major effects of childhood PTSD among males is later aggression. Van der Kolk (1987) also reported that traumatized children have problems with aggression regulation. As mentioned earlier, if left untreated PTSD may be a chronic condition.

Most research on the relationship between PTSD and aggression has been with combat veterans (Beckham et al, 2000). Similar to an offending population, combat veterans may also be victims, witnesses and perpetrators of violence. In a review of this area, Beckham et al (2000) concluded that there is strong evidence that anger, hostility and violence are common problems in Vietnam combat veterans with PTSD. Beckham, Feldman, Kirby, Hertzberg and Moore (1997) found that combat veterans with PTSD reported committing 13-22 acts of violence in the previous year compared to 0-3 acts by veterans without PTSD. PTSD symptom severity was also significantly associated with higher levels of violence. Byrne and Riggs (1996) also reported that, among male Vietnam veterans, there was an association between level of PTSD symptomology and the use of physical aggression in personal relationships.

The notion that those with PTSD may be likely to become violent has gained such credence that a fairly recent article debated the liability of PTSD-related violence and whether media content may act as a stressor for violence by those with PTSD (Veraldi and Veraldi, 2000).

1.3.4 Trauma type, PTSD and violence

The idea that there may be a specific type of trauma involved in the links found between PTSD and violence has started to receive some attention by researchers. Spitzer et al (2001) found that the most common trauma involved in the development of PTSD and partial PTSD among forensic patients was childhood physical abuse. Briere and Runtz (1990) examined type of trauma and later behavioural problems and found that childhood physical abuse was uniquely associated with aggression towards others. Finklehor (1987) reported that certain psychological sequelae to traumatic events may be trauma-specific. In a study of combat veterans, Laufer et al (1985) found that witnessing violence and combat was associated with re-experiencing symptoms
whereas perpetration of violence was associated with denial.

It could be hypothesized that PTSD relating to violent events may show a greater link to aggressive behaviour than trauma that is non-violent related (e.g. natural disaster). There may be a number of different reasons why PTSD from violent trauma may be particularly associated with aggression. PTSD involves intrusive thoughts, memories and flashbacks. If these symptoms relate to a violent event then intrusions and attempts at avoidance would be likely to involve a violent content. Experimental studies have found that trauma-specific material is more readily accessed from memory among PTSD patients (review by Thrasher and Dalgleish, 1999). This may increase the likelihood of retrieving a violent response from the repertoire of possible behavioural responses to social situations held in memory (Dodge et al, 1997). Another feature of PTSD is hypervigilance, whereby the individual scans the environment for potential danger. The person with PTSD from a violent act would be specifically hypervigilant to violent acts (as opposed to car lights etc. in terms of a person involved in a car accident). Hypervigilance to violent stimuli is found to occur in aggressive individuals (e.g. Gouze, 1987). It is this aspect, the selective processing of trauma-specific stimuli, that is the focus of this study and will be elaborated upon later on in this Introduction. It is acknowledged that there may be a host of other mechanisms that may also link the two. For example, feelings of anger, revenge and hatred may be more heightened in someone who has been traumatized by a violent event as opposed to an accident or a natural disaster. Such emotions may increase a person’s risk of being aggressive.

The relationship between PTSD and violence has almost exclusively been studied among combat veterans. Violent offenders provide a useful group to study PTSD among, in that different types of traumatic events may be screened for and compared. It can be explored whether there is a difference in the relationship between violence and PTSD symptomology based on violent and non-violent events. A further aspect of the relationship between PTSD and violence that may be built upon, is to explore PTSD symptomology that is related to being a victim or perpetrator of violence, or both.
1.4 Theoretical models linking PTSD and violence

1.4.1 Information processing and PTSD

A number of different approaches have attempted to describe and understand the nature of PTSD. These include early models based on learning theory (e.g. Mowrer 1947), psychodynamic theories (e.g. Horowitz, 1976), cognitive theories (e.g, Beck and Emery, 1985; Ehlers and Clark, 2000) and information-processing theories (e.g. Chemtob et al, 1988). Information-processing models of PTSD may be particularly useful in understanding mechanisms that link PTSD to violence.

Information processing theory proposes that information about an emotional stimulus, its meaning and a repertoire of responses are stored in memory networks (Witvliet, 1997). Information associated with extreme emotion (e.g. fear) is more readily retrieved from memory and is difficult to suppress once activated (Witvliet, 1997). Experimental studies have shown that people display better memory performance for highly emotive stimuli (Bradley, Mogg and Williams, 1994). Information processing models also highlight the role of processing biases in PTSD. Using a cognitive action theory of PTSD, Chemtob et al (1988) hypothesize that traumatic events heighten arousal to threat in the environment which serves as an adaptive response in life threatening situations. Individuals with PTSD may show similar responses, even when the source of danger is no longer present, by scanning their environment for further potential threat. If a person perceives that there may be a threat, threat-response structures are activated that lead the person to selectively process that threat while ignoring other sources of information. Individuals with PTSD may even interpret ambiguous information as threatening, and attentional resources tend to focus on the potential threat while the individual gathers more information to assess the situation (Chemtob et al, 1988).

Support for Chemtob et al's (1988) model is provided by experimental research that has found that subjects with PTSD selectively attend to trauma-related stimuli (Litz and Keane, 1989; reviews by McNally, 1998; and Thrasher and Dalgleish, 1999). This will be elaborated on later in Section 1.5. It is possible that if individuals with PTSD have experienced violence-related trauma, then they may selectively process violent stimuli as it would be trauma-specific. According to this argument, individuals who have PTSD
relating to violent events would show selective processing of violent stimuli whereas those who were traumatised through a non-violent event would not. Currently there are no studies that have examined whether individuals with PTSD arising from violent trauma selectively process violent stimuli.

1.4.2 Information processing and violence

Research suggests that violent individuals also tend to show heightened attention to threatening stimuli (e.g. Gouze, 1987). This may provide a common mechanism that would help explain links between PTSD and violent behaviour.

Research by Dodge and colleagues (1984,1990,1995) has provided support for their information processing model of aggressive responding that is based on a stage model of adaptive cognitive processing. The stages involve the selective attending to and processing of environmental cues, interpretation of social situations, selection of possible behavioural responses, and evaluation of a behavioural response. Aggressive responding, according to the model, occurs due to biases at each stage of the process. In a series of experiments, Dodge and colleagues (1984,1990,1995) found that aggressive children showed social information-processing biases including attention to and encoding of irrelevant social cues, interpreting ambiguous situations as hostile, restricted repertoire of behavioural responses (more prone to aggressive response) and the evaluation of aggression as a successful response.

It is the initial stage (selective attention and processing) of this model that is of particular interest to the current study. Information-processing theory explains how this process is based on selective processing of all information available to us in the environment (e.g. Huesmann, 1988). Information that is selected and processed relies on existing schemata to build on. Expectations and beliefs about aggression will influence the extent to which social cues relating to aggression are noticed, interpreted and processed. A range of distal (e.g. past aggressive experiences) and proximal (e.g. angry mood state) factors may prime an individual to be vigilant to aggressive cues in the environment. This has been supported by research findings. For example aggressive boys attend to aggressive stimuli more than non-aggressive stimuli and find it difficult to divert their attention away from such stimuli (Gouze, 1987).
Dodge, Pettit, Bates and Valente (1995) found that children who were physically abused also showed the same biases in information-processing as aggressive children displayed. These biases that are common to both abused and aggressive children have helped explain mechanisms involved in the cycle of violence (Dodge et al, 1990). However, in these studies involving violent trauma, the presence or absence of PTSD symptoms has not been assessed. Studies of trauma victims in general have found that it is only the persons with PTSD that tend to show biases in information processing (McNally, 1998). Preliminary research on maritally violent men suggests that Dodge et al’s (1995) social information processing model may also be applicable to adults (Dutton and Holtzworth-Munroe, 1997). Beckham et al (2000) suggest that similar methodologies to those used by Dodge and colleagues would be useful to employ on an adult PTSD sample. As yet no exploration of PTSD and information-processing biases has been conducted in violent offenders.

1.4.3 Information processing models of PTSD and violence

As previously illustrated, common to PTSD and violent responding is the process of attending to threat stimuli and interpreting ambiguous situations as threatening. Chemtob, et al (1997) have developed a framework for understanding anger and aggression in combat-related PTSD. It is based on Chemtob et al’s (1988) model as described earlier but also incorporates Novaco’s (1994) model of anger. According to Chemtob et al (1988, 1997) patients with combat-related PTSD display what is termed as a "survival mode" of functioning. "Survival mode" is characterized by the activation of cognitive structures used to respond to life-threatening situations. These are activated rapidly at the expense of other cognitive structures due to the over-riding importance of life threats. In war situations the ability to respond quickly and efficiently to the minimal evidence of threat is adaptive, as is threat confirmation bias and increased vigilance. When taken out of context of a life-threatening situation, “survival mode” becomes context-inappropriate and maladaptive. In PTSD it would appear that there is a failure to suppress “survival mode” in the absence of threat. According to Chemtob et al (1997), “survival mode” concurrently activates anger structures that act as disinhibitors for aggression. Other authors have also argued that emotional arousal in traumatised people tends to precipitate ‘fight or flight’ reactions without an assessment of the
psychological meaning of the situation (Krystal, 1978; van der Kolk, 1987). The attentional bias to threat and the interpretation of ambiguous situations as threatening may result in an aggressive response in situations where there seems little provocation.

Chemtob et al's (1997) model may also be applicable to those involved in other types of violent situations than combat. This may be especially true for those who have been exposed to multiple traumas or Type II trauma (Terr, 1991) due to the anticipation of the next violent episode. If PTSD is associated with cognitive biases towards perceived threat, then violent offenders who are traumatised may be at greater risk of further violent behaviour as a response to perceived danger.

The experimental methods used to examine selective processing of threat cues will now be examined.

### 1.5 Selective processing of threat

#### 1.5.1 Experimental paradigm and PTSD

Increasingly, the experimental paradigm has been used to compliment research based on self-report in anxiety and mood disorders. Reaction-time tests have helped to widen our knowledge about the information-processing biases that appear to occur in a range of emotional disorders (Williams, Watts, MacLeod and Mathews, 1997). Researchers in the field of PTSD have used a number of reaction time methodologies to examine information-processing biases. These include the Emotional Stroop Test (e.g. Foa, Feske, Murdock, Kozak and McCarthy, 1991), the dot probe task (MacLeod, Mathews and Tata, 1986), and the dichotic listening task (e.g. Trandel and McNally, 1987). Of these information-processing tasks, the oldest and most commonly used is the Emotional Stroop Test. It is this test that is the method of investigation used in the current study.

#### 1.5.1.1 Emotional Stroop Test

The Emotional Stroop Test is a modified version of the original Stroop Test (Stroop, 1935). In the numerous studies that have used the original Stroop Test, a consistent finding is that it takes people longer to name the colour that words are printed in than to
read the word itself. Furthermore it takes even longer to name the colour that a word is printed in, if the word itself is an incongruent colour word (e.g. if the word "green" is printed in red ink). This effect has come to be known as Stroop interference. A number of different Stroop formats have been developed across the years and Spreen and Strauss (1998) provide a good summary of the variations involved. The number and presentation of items in a trial have varied considerably, as have the number and type of colours used. Scoring may be obtained by time taken to respond, number of errors, or number of items read in a given time limit. There have been a variety of explanations given to account for this phenomenon and the test has been adapted to study a range of psychological and neuropsychological functioning (see Spreen and Strauss, 1998). Of interest to the present study is the modified Stroop test used for emotional disorders.

In the Emotional Stroop Test, words with differing emotional content are presented in coloured ink. The task is to name the colour that the word is printed in while ignoring the meaning of the word. However as in the original task, participants cannot but help process the word meaning. A common finding is that people with emotional disorders show greater Stroop interference for words with negative emotional content than for neutral words. Control groups of participants without any emotional disorder do not show any response difference between neutral and negative words. The Stroop effect becomes stronger when the words are especially relevant to the emotional disorder (Williams, Mathews and MacLeod, 1996), for example, if words such as “hairy” or “crawl” are used among a group of spider phobics (Watts et al, 1986). This effect has been shown across a number of different emotional disorders including depression (Williams and Nulty, 1986), generalized anxiety (Mogg, Mathews and Weinman, 1989), eating disorders (Chanon, Hemsley and de Silva, 1988), obsessive-compulsive disorder (McCarthy, Foa, Murdock and Ilia, 1990) and PTSD (McNally, Kapsi, Riemann and Zeitlin, 1990 – see later on in Section 1.5.1.2). McNally et al (1990) argue that PTSD is an ideal condition through which to examine the Stroop effect as a suitable control group is provided by trauma victims without PTSD. This in particular allows for familiarity with emotional material to be controlled for.

In a review of the Emotional Stroop task and psychopathology, Williams et al (1996) provide a summary of results from studies of different emotional disorders. They found that the greatest effect size was shown in studies of PTSD. They suggest that the strong
effects shown in PTSD may reflect specific or additional mechanisms that may help explain the Stroop effect. The likelihood, they suggest, is due to the specific re-experiencing symptoms that PTSD patients experience.

Traditionally the Emotional Stroop task has been presented in either a card or computerised format. Computerised formats have the benefit of presenting word types in a randomised order thus minimising problems of postattentional processing and disentangling automatic and non-automatic processes (McNally et al, 1990). With computerized formats the problems with order of card presentation are prevented thus reducing any practice or fatigue effects. However, the card format has been used successfully for years, and is cheap and easy to use. The card format is easily portable and capable of identifying psychopathology (McNally et al, 1990).

1.5.1.2 Emotional Stroop Test and PTSD

Emotional Stroop Test studies have repeatedly found that people with PTSD show heightened Stroop interference for trauma-related words than non-trauma related stimuli (see reviews by Thrasher and Dalgleish, 1999; and McNally, 1998). The consistency of this finding seems particularly robust when we consider, as McNally (1998) rightly observes, that trauma-related words are only a pale reflection of the richness of trauma-related memories and also given that the trauma-related words are presented in the absence of other social cues.

Foa et al (1991) used an Emotional Stroop procedure with rape victims to assess selective processing of threat information. Three groups were examined: rape victims with PTSD, rape victims without PTSD, and a control group of individuals who had not been rape victims. Rape victims with PTSD showed greater Stroop interference for specific threat (rape-related) words than general threat words (relating to physical harm and death), neutral words and non-words. There were no significant differences in response latency scores across the different word types for rape victims without PTSD or for the non-traumatised control group. Another finding was that those who had been successfully treated for PTSD with cognitive behavioural therapy no longer showed delayed colour-naming latencies. These results indicate that it is not the experience of the trauma itself that accounts for the Stroop effect but rather the presence of PTSD.
symptomology. Other studies have also found that the Stroop effect appears attributable to PTSD as opposed to a history of traumatic experience. For example, in McNally et al's (1990) study of Vietnam veterans, those with PTSD showed Stroop interference for trauma-specific words (e.g. bodybags), whereas veterans without PTSD did not. Other word types within this study included obsessive-compulsive words (e.g. germ), neutral words (e.g. mix), and positive words (e.g. happy). As the PTSD group only showed selective processing of trauma-specific words, this would suggest that it is the threatening nature of the stimuli that accounts for the interference, rather than general emotionality of words.

Selective processing of threat among rape victims has also been studied by Cassiday, McNally and Zeitlin (1992). They found that rape victims with PTSD showed longer colour-naming latencies for high threat rape words than moderate threat rape threat words. This provided further support for Stroop interference being related to degree of threat-relevance. Cassiday et al (1992) also found that Stroop interference was positively associated with symptom severity. Those with partial PTSD showed colour naming latencies for trauma words that were intermediate between participants with full-blown PTSD and those without any PTSD symptoms.

Both rape and combat are specific situations that may involve a type of violence. However, a Stroop interference examining PTSD arising from violent trauma in general has not been examined. It would be expected that those with PTSD from a violent trauma would show greater Stroop interference for violent words.

1.5.2 Experimental paradigm and violence

Use of the reaction-time paradigm among violent offenders has only recently emerged. Recent research by Smith and Waterman (in press) has examined processing biases for aggression words using the dot-probe task and the Emotional Stroop Test. Three groups were compared: violent offenders, non-violent offenders, and undergraduates. In the dot probe task, two matched words (aggressive and non-aggressive) are randomly presented on a computer screen. Once the words disappear, a dot appears on the screen and the task is to indicate whether it appears where the top or bottom word appeared. Violent offenders were found to respond significantly quicker to dot probes that replaced
aggressive words than undergraduates. Smith and Waterman (in press) used a computerized version of the Emotional Stroop with aggressive words. A negative emotion word condition was also used to control for general negative emotionality of word content. A significant group difference was found with violent offenders showing greater interference for aggressive words compared to general negative emotion words than the non-violent offender group, and the undergraduate group.

1.5.3. Explanations of the Stroop effect

A number of theories have developed to account for the Emotional Stroop effect. One explanation is proposed by Glaser and Glaser (1982). They argue that a conflict arises at the response output phase between the instruction to name the colour of the word and the automatic response to read the word. When anxiety-related material is introduced there is heightened competition at the response output stage because traumatic material is more easily activated in long-term memory. McNally (1998) argues that the Stroop interference observed among people with PTSD is not so much about trauma information being readily activated but about failure to inhibit trauma-related material once it becomes activated.

Williams et al (1996) propose that Cohen et al’s (1990) connectionist model of the original Stroop can provide a useful model to explain the Emotional Stroop effect. This hypothesis emphasizes the role of attentional bias as opposed to response competition. They argue that it helps explain mechanisms relating to current concerns, danger schemas and any expertise effects that may arise from long-term familiarity with target material.

Williams et al (1996) also examined a number of possible artifactual explanations for the Stroop effect. These included inter-item priming, repetition of words and whether individuals are consciously attending to target words. Taking the evidence available for each of these possible hypotheses, they concluded that the Stroop effect was not due to any artifactual explanations.

As most of the research on the Emotional Stroop effect has taken place on those with anxiety disorders it is difficult to say whether similar accounts could be used to explain for differences observed in aggressive and non-aggressive individuals. More research needs to be conducted in this area to examine whether similar underlying mechanisms
are involved when problems with aggression are being studied.

1.6 Summary of gaps in the research

This literature review and background to the current study has identified a number of areas where further research is required. It is well known that there is a high level of trauma among violent offenders but there is less research that has examined levels of PTSD among this group. Research has started to identify a link between PTSD and violence. However, more research is required to explore whether trauma type that the PTSD has arisen from is relevant to this relationship. Most research examining the relationship between PTSD and violence has focused on combat veterans. For the most part, combat experiences are likely to constitute violence. It is possible that PTSD arising from violent trauma may be related to violent behaviour but PTSD that has arisen from non-violent trauma may not be related to violence. Information processing theory strengthens this argument. Trauma victims with PTSD have consistently shown to selectively process trauma-specific stimuli. In the case of individuals with PTSD arising from violent trauma, selective processing of violent stimuli is likely to occur. The same biases are not likely to be shown in those with PTSD arising from non-violent trauma. This notion requires further empirical investigation. The selective processing of violent stimuli is shown to occur as part of a sequential process in aggressive responding. Selective processing of violent stimuli may therefore be one possible mechanism through which PTSD and violence may be related.

1.7 Hypotheses

Hypothesis 1: There will be a high level of trauma and PTSD among violent offenders.

Hypothesis 2: There will be a positive relationship between PTSD (arising from violent trauma) and violence (as measured by HCR-20 score).

Hypothesis 3: There will not be an association between PTSD (arising from non-violent trauma) and violence (as measured by HCR-20 score).
Hypothesis 4: There will be a positive relationship between PTSD (arising from violent trauma) and selective processing of violent stimuli (as measured by Stroop interference).

Hypothesis 5: There will not be a significant association between PTSD (arising from non-violent trauma) and selective processing of violent stimuli (as measured by Stroop interference).

Hypothesis 6: There will be a positive relationship between Violence (as measured by HCR-20 score) and selective processing of violent stimuli (as measured by Stroop interference).
2. METHOD

2.1 Design

A cross-sectional, quantitative design was used to investigate associations between PTSD, violence and selective processing of threat stimuli among a group of male patients at an English maximum security psychiatric hospital.

2.2 Participants

A total of 28 participants were involved in this study. All were male patients within a Personality Disorder (PD) Service at a maximum security psychiatric hospital. All were detained under the Mental Health Act (1983) as having a psychopathic disorder. All the men involved in the study had committed a serious criminal offence. The Personality Disorder Service consisted of 6 wards: an assessment ward, two treatment wards, and three rehabilitation wards.

All male patients within the PD Service of the hospital were identified using an information database provided from medical records. This was to initially exclude those patients with an identified psychosis and / or learning disability. A total number of 82 patients were identified. Each of the Responsible Medical Officers (RMOs) covering the service were contacted with a list of their patients to give their consent and recommendation that the patient was capable of giving consent (a copy of the consent form is included in Appendix 1). Each RMO was also asked to indicate whether any of the patients identified were psychotic (the hospital was undergoing a transformation involving the allocation of patients to the appropriate service, however some patients with severe mental health problems were still within the PD service). Once consent for patients on each ward was given, the ward manager or team leader was contacted to discuss the research and how best to proceed with contacting patients. The "Named Psychologist" for each patient was also contacted to discuss any potential problems with asking the patient to engage in the research (each patient in the hospital is allocated a psychologist as a liaison person). This process involved screening out patients with a serious mental health problem, those on the autistic spectrum, with an identified brain
injury, those who were on leave or had moved on, or those who were considered to be too emotionally fragile to be seen at that time. A total number of 46 patients were contacted to ask whether they wished to participate in the study. Each person who was contacted was given a verbal description of what the research procedure would involve and a "Patient Information Sheet" (included in Appendix 2). It was felt especially important that potential participants were informed explicitly that the interview would involve questions about traumatic or stressful life events. The reasons for this will be discussed in more detail later in the section entitled "Ethical Considerations". Of those who were asked, 18 chose not to participate in the project. The group of individuals who had declined to be involved in the study was compared to those who were involved on the following variables:

- Age
- Ethnic status
- Length of stay in the hospital
- HCR-20 score

These are reported on in the Results Section.

2.3 Materials

2.3.1 PTSD

2.3.1.1 Clinician Administered PTSD Scale (CAPS)

The Clinician Administered PTSD Scale (CAPS; Blake, Weathers, Nagy, Kaloupek, Klauminzer, Charney, and Keane, 1995) is a semi-structured interview that assesses the seventeen symptoms of PTSD according to DSM-IV criteria, and five associated features of the syndrome. It may be used as a categorical measure of diagnostic status but also provides dimensional ratings of frequency and severity of symptoms. The CAPS also provides a checklist of Criterion A events that may be screened for. Unlike many other measures of PTSD, the CAPS includes the perpetration of violence as a potential traumatic event. This enabled the CAPS to be an ideal measure for the purpose
In a recent review, the CAPS was shown to have excellent psychometric properties across a range of research settings and clinical populations (Weathers et al, 2000). Interrater reliability was consistently at the .90 level and above. Internal consistency has been high with alphas predominantly in the .80 and .90 range. The CAPS has been considered to be the most valid measure of PTSD available relative to other structured interviews and self-report measures (a detailed review of the psychometric studies in this area is provided by Weathers et al, 2000). The diagnostic interview is considered to be the "gold standard" in determining diagnostic utility. The only other single measure that comes close to the CAPS in assessing for PTSD is the Structured Clinical Administered Interview for DSM-IV Disorders (SCID) which appears to be not as reliable as the CAPS (Weathers, Ruscio and Keane, 1999).

The CAPS requires the interviewer to be a mental health practitioner with experience of conducting diagnostic interviews and knowledge of psychopathology. The interviewer met these criteria having had previous clinical experience of assessing and treating PTSD among a group of forensic patients. The ratings are based on self-report, but the overall rating is drawn from a combination of self-report, interviewer's confidence in the report, and observation of the participant throughout the interview. This has benefits over reliance on questionnaire response that is based only on tick boxes. The interview process helps minimize misinterpretation of questions by the respondent. This is especially important among a forensic population where many have poor academic backgrounds and some have limited literacy skills. An interview format also allows the researcher to clarify uncertainties and ask follow-up questions to help assess for differential diagnosis. Questionnaires may have a tendency to generate false positives due to symptom overlap between other disorders. For example, many symptoms of PTSD may overlap with other anxiety disorders (e.g. avoidance and arousal symptoms). There are also symptoms that may be endorsed with someone who is depressed (e.g. sleep difficulties). The CAPS allows for these symptoms to be assessed for whether or not they are likely to be trauma-based. Likewise, the interviewer may consider that a symptom is present from observations of the participant (e.g. avoidance) when the participant has denied the symptom. The interviewer may then be able to establish the most valid response by asking further questions.
The main drawback of the CAPS is that it takes approximately 30-60 minutes to administer, making it a longer process than self-report questionnaires. The interview also requires that each participant be seen on an individual basis. However, as administration of the Emotional Stroop Test required a one-to-one situation, this was already a requirement of the design (see later section 2.3.3.1).

It is possible to assess for lifetime PTSD using this instrument however due to the potential unreliability of retrospective reporting of symptoms, a decision was made to only assess current PTSD. In order to keep administration time to a minimum, the supplementary questions provided at the end of the interview schedule were not administered.

In order to organize the data for the analysis, Criterion A events were categorized as either violent or non-violent. These were categorized using the definition provided in the Introduction Section. This definition is consistent with the definition of violence used in the HCR-20 (Webster et al, 1997 - see next section on Violence). Violent traumas were categorized further by whether the participant was a victim or perpetrator of violence.

2.3.2 Violence

Difficulties in the measurement of violence were outlined in the Introduction Section. Initially a combination of a hospital and prison sample was to be used, to examine differences between violent and non-violent offenders. This dichotomy fell into difficulties, namely that many offenders with a current conviction for a non-violent offence had also committed a violent act in the past, or displayed aggressive behaviour on an ongoing basis. Some individuals had committed violent offences many years ago and were now considered to be not at risk of violent offending nowadays. Thus the use of conviction data alone seemed problematic. Due to further pragmatic reasons (clinical placement and difficulties in gaining access to prison sample when research placement was arranged), only a hospital sample was used. As the majority of the individuals within this setting had displayed some form of violent behaviour at one time, it was decided that a dimensional, rather than categorical, approach to the measurement of
violence would be taken. The issue of temporal distance between past violent behaviour and current propensity for violence also needed to be considered. This was especially important as both measurements of PTSD, and selective processing of threat, were current. The use of behavioural data was considered as a possible method of overcoming these difficulties. However, this also proved to be problematic as violence is often prevented due to staff interventions. In the context of high secure conditions other clinical markers (e.g. attitudes, insight etc.) are often considered as indications of whether a person has changed their behaviour pattern. Whether or not someone is violent is also dependent on specific contextual factors that may be present or absent in an institution. In order to address some of these difficulties in measuring violence, it was decided that a risk assessment instrument that incorporated historical, clinical and contextual risk factors would be a sensible option.

2.3.2.1 HCR-20

The HCR-20 (Webster et al, 1997) is a checklist of 20 items that assess the risk of violence. There are three sub-scales that comprise of 10 historical items (H), 5 present clinical items (C) and 5 risk management items (R) (see list of factors overleaf). For each factor, a probability of low (0 points), medium (1 point) or high (2 points) is allocated. For example, on item H1 which refers to “Previous Violence”, a score of 0 would be given to someone who has shown no previous violence, a score of 1 would be allocated where possible / less serious previous violence (one or two acts of moderately severe violence) was evident, and a score of 2 would be given where there is evidence of definite / serious previous violence (three or more acts of violence, or any acts of severe violence). Clear guidelines to the coding of the various factors are provided in the HCR-20 manual. Information is gathered from multiple sources. Scores on the HCR-20 range from 0 to 40.

The items that make up the HCR-20 are as follows:
**Historical**

H1. Previous violence  
H2. Young age at first violent incident  
H3. Relationship instability  
H4. Employment problems  
H5. Substance use problems  
H6. Major mental illness  
H7. Psychopathy  
H8. Early maladjustment  
H9. Personality disorder  
H10. Prior supervision failure

**Clinical**

C1. Lack of insight  
C2. Negative attitudes  
C3. Active symptoms of major mental illness  
C4. Impulsivity  
C5. Unresponsive to treatment

**Risk Management**

R1. Plans lack feasibility  
R2. Exposure to destabilisers  
R3. Lack of personal support  
R4. Noncompliance with remediation attempts  
R5. Stress

The different factors involved in the HCR-20 were selected from a review of research evidence of factors relating to violent behaviour and consultation with experienced
The primary reason for selecting the HCR-20 over other measures of violence is that it includes the range of past, present and contextual factors associated with violence. A study investigating inter-rater reliability revealed a correlation of .80 between raters (Douglas, Webster, and Wintrup, 1996 cited by Webster et al 1997). The HCR-20 has been shown to correlate with previous violent crime, with the Historical and Risk Management sub-scales more consistently related to violence (Douglas et al, 1996, and Douglas, 1996 cited by Webster et al, 1997). The HCR-20 has also been shown to relate as strongly to past violence as the Hare Psychopathy Checklist-Revised (PCL-R; Hare, 1991) and Violence Risk Appraisal Guide (VRAG; Rice and Harris, 1995), both of which have been subject to large, prospective studies. In a more recent prospective study by Belfrage, Fransson and Strand (2000) the HCR-20's clinical and risk factors were highly predictive of institutional violence.

The HCR-20 data was available as both research and clinical information on a shared database and had been collected by a research psychologist. As some of this data had been collected approximately six months earlier, this may have influenced some of the clinical and risk items. However, due to the chronic nature of this client group’s difficulties, significant clinical change is likely to occur over a period of years rather than months. Hence the clinical and risk HCR-20 ratings appeared to remain applicable. The historical data that comprises of half the items of the HCR-20 remained relevant. The benefit of using data that was not collected by the current researcher, was that the probabilistic statements required for the HCR-20 were not inadvertently biased, by having already administered the Violent Stroop Test and CAPS to each participant.

2.3.3 Selective processing of threat cues

2.3.3.1 Development of Violent Stroop Test

A specially adapted Emotional Stroop Test for violence was constructed ("Violent Stroop"), consisting of three stimulus cards. These were presented on A4 size paper, each containing 50 stimuli presented in a 5 x 10 matrix. The five colours that were used
were red, blue, yellow, black and green, presented on a white background. Copies of the stimulus cards are included in Appendix 3.

The stimulus words for the Violent Stroop were selected by asking an independent group (consisting mainly of psychologists, journalists and office workers, n = 35) to name 10 words that they associated with violence. The 20 most frequent words were selected, along with the word "violent" itself (participants had not used this word due to the phrasing involved in the task).

It was considered that the words chosen for the test should be selected by an independent group of violent offenders. Therefore a local prison was contacted via the Psychology Department. Participants for this stage of the research process were identified using the prison database and records. Prisoners included in this sample had either a current conviction for a violent offence; or were currently on remand for a violent offence with a previous conviction for a violent offence (offences included Murder, Actual Bodily Harm, Grievous Bodily Harm and Wounding). An opportunity sample of those who were present on the wing at the time of contacting the officer in charge was used. The individuals who completed the response sheets remained anonymous to the investigator. The independent group of violent offenders (n= 13) were presented with the list of 21 violent words and asked to rate the top five words that they found most threatening. They were also asked to generate any other violent words that they also found threatening. This was to enable any possible slang words used among offenders, not generated by the initial sample, to be included in the threat stimuli.

The five most common words rated as threatening by the violent sample were used as threat stimuli for the Violent Stroop, and consisted of the words, "murder", "violent”, "kill", "hate", and "death". A list of possible neutral words, to act as controls for the Violent Stroop were selected from the MRC Psycholinguistic Database. These were matched to the violent words for word length, number of syllables and frequency of usage in the English language. These words, in addition to the violent words, were then rated by 10 independent Forensic Psychologists for emotionality, using a five point Likert scale (see Appendix 4). Only the words rated as "neutral" were selected for the control condition. The five words included in the neutral condition were, "junior",
"advised", "wind", "wire" and "quite".

Finally a third condition, using strings of "0"s, matched for word length (6, 7, 4, 4 and 5 digits in length), was used as a non-semantic control. This was presented first and therefore served as a practice run for the participants, to increase accuracy and minimize practice effects over the next two trials.

Each word was presented the same number of times, and the same number of times in each colour. The colours were placed in a random order on each card. However, none of the same words or colour was presented twice in a row. Stroop interference scores were obtained by subtracting the time taken to complete the neutral card from the time taken to complete the violent card.

2.3.4 Covariants

A number of different covariants were examined as part of the analysis (see Data Analysis, later on in this section), one of which was substance use. Data on participant's substance use history was available as it had been gathered as part of a clinical audit. The instrument used, the Substance Use Screening Tool (SUST), is a new tool designed for specific use with a forensic population (a copy is included in Appendix 5). The SUST is currently undergoing psychometric validation. For the purposes of this study, total SUST scores were used as an indicator of previous substance use. Unfortunately data was only available for a total of 16 of the sample. Nevertheless, any relationship between substance use and the variables used in this study was examined among this sub-group.

2.4 Procedure

Each participant was seen on an individual basis in a private therapy room on the ward where they were staying. Each participant was reminded of what the session would entail and was asked whether they had any questions before the procedure began. The meeting consisted of administering the Violent Stroop, followed by the CAPS. The reason for this order was to prevent the individual from being "primed" through
discussing any trauma before the Violent Stroop had been presented. This order also
helped to minimize any potential researcher biases by being unaware of the participant’s
trauma history prior to administering the Violent Stroop. The HCR-20 data was also
gathered after the interview, again to minimize any bias in recording the Violent Stroop
score and CAPS data.

As described earlier, the Violent Stroop consisted of three cards. McNally et al (1990)
suggest that the order of administration goes counter to the hypothesis in terms of any
practice effects. Therefore the non-semantic (Os) card was presented first, the neutral
card was presented next, and the Violent Stroop was administered last. McNally et al
(1990) also point out that a second reason for this order is because if the trauma-related
stimuli is administered first, participants with PTSD may carry over any intrusions from
the test on to the next stimulus card.

Each participant was shown a sample of the five colours and asked to name them. They
were instructed to stick to the same colour names throughout. Participants were asked to
name the colours that the ink was printed in, and in the case of the words it was
emphasised that the colour should be named, rather than the word. They were asked to
read from left to right along each row till they reached the bottom of the page. In each
case the participant was told that they would be timed and to name the colours as
quickly as possible.

The time taken to complete each card was recorded on paper to two decimal places.
Following the administration of the Violent Stroop, the participant was given brief
feedback to explain that the test was examining processing of emotional information.
The participant was then informed that the remainder of the time would be spent
exploring stressful life events. The instructions given on the CAPS were administered
and the interview was conducted according to the instructions. All the interviews were
conducted by the current researcher, to increase the reliability of the data.

The interviews varied in length but most lasted for approximately an hour and a quarter.
Each individual was then thanked and asked whether they had any further questions.
Although the research was not part of routine clinical practice, and the information
given did not form part of the clinical record, participants were given the opportunity to
discuss any clinical needs they may require at the end of the session. Anyone who had found the subject matter difficult was asked whether they wished the interviewer to provide feedback to the clinical team.

2.5 Ethical Considerations

The research was approved by the hospital's ethics committee. A copy of the ethical agreement is provided in Appendix 6. Approval for contacting prisoners for the Stroop words was obtained via HM Prison Psychology Department. The research was registered at Leicestershire and Rutland NHS Trust’s research and development department. As the area of research was addressing potentially sensitive issues, several precautions were taken. As described earlier, those who were deemed too emotionally fragile at the time, were screened out by the clinical team. It was made explicit to potential volunteers that the interview would be asking sensitive questions about traumatic life events. This was explained both verbally by the researcher and in the Patient Information Sheets, prior to signing the consent forms. Each participant was reminded of the sensitive nature of the questioning before the interview began. Participants were also informed that they were engaged in the session on an entirely voluntary basis and that at any time they were free to terminate the session or take a break. It was stressed that any decision made to not be involved would not be held against them in terms of their treatment and care at the hospital. At the end of the session, participants were briefly assessed for how they were feeling as regards the nature of the material discussed. The opportunity to discuss issues further, in terms of a "cooling off" period, was offered. Participants were also offered either feedback to the clinical team or to their Named Psychologist. All of the participants in the research had previously disclosed the traumas / abuse that they had experienced.

2.6 Data Analysis

Demographic data on the participants was gathered from medical records and is presented in the Results Section. The information gathered was age, length of stay in hospital and ethnic status.
The measure of Violence (HCR-20) data was ordinal and the PTSD data did not fit a normal distribution (using chi-square goodness of fit). Therefore the data used to test the hypotheses did not reach the requirements for parametric tests. Spearman's rho correlations were used to examine associations between continuous variables of PTSD and Violence. A Mann-Whitney U Test was used to examine group differences (i.e. PTSD diagnosis or not). A significance level of <0.05 was used throughout. As the direction of the associations was predicted, one-tailed tests were used.

An additional analysis examining interaction effects of PTSD and Violence on Stroop interference was also conducted. The numbers were too small to conduct an inferential statistical test, therefore general trends were presented in a graph.

A number of co-variants were also examined. These were age, length of stay in hospital, substance use, age of first trauma, total number of traumas, number of violent traumas and Type II Trauma. Correlations were used to examine any associations (Spearman's rho or Pearson's Product Moment, depending on whether the data fitted criteria for parametric testing or not). Mann-Whitney U Tests were used to examine group differences. As directional predictions were not made, these analyses used two-tailed tests.

A comparison of the group of the participants with the group who declined to take part in the research was also conducted. The variables that were examined were age, length of stay, HCR-20 score and ethnic status. Mann-Whitney U Tests and Independent t tests were used to examine group differences (depending on whether the data was parametric or not). As directional predictions were not made, these analyses used two-tailed tests.
3. RESULTS

The Results Section is divided into 10 sections. The first section will provide a description of the participants who were involved in the study. The next 6 sections will examine each of the hypotheses that were proposed in the Introduction. In the following section an additional analysis will be presented. The next section will include analysing several possible co-variants. Finally, the last section will compare the participants used in the study, across a number of variables, with the group who declined to be involved. Descriptive data from the Violent Stroop test is included in Appendix 7.

3.1 Description of participants

From Table 1 it can be observed that the participants ranged in age from 24 to 55 years of age with a mean age of 38.7. There was considerable variation in the length of time that participants had stayed at the hospital with a minimum of 1 year and a maximum of 31 years. The mean length of stay was 9.4 years.

Table 1. Descriptive data (range, mean and standard deviation) for age and length of stay of participants.

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (in years)</td>
<td>24-55</td>
<td>38.7</td>
<td>8.59</td>
</tr>
<tr>
<td>Length of stay (in years)</td>
<td>1-31</td>
<td>9.4</td>
<td>7.65</td>
</tr>
</tbody>
</table>

It can be observed from Table 2 below that the ethnic status of the majority of the sample was White British. Two of the participants were reported as being from a Mixed Background and one of the participants was Black Caribbean.
Table 2. Breakdown of the ethnic status of the participants.

<table>
<thead>
<tr>
<th>Ethnic Status</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>White British</td>
<td>25</td>
<td>89.29</td>
</tr>
<tr>
<td>Black Caribbean</td>
<td>1</td>
<td>3.57</td>
</tr>
<tr>
<td>Mixed White and Asian</td>
<td>1</td>
<td>3.57</td>
</tr>
<tr>
<td>Any Other Mixed Background</td>
<td>1</td>
<td>3.57</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100</td>
</tr>
</tbody>
</table>
3.2 Hypothesis 1: There will be a high level of trauma and PTSD among violent offenders.

The levels of trauma and PTSD among the group of participants will be examined separately, and compared to national figures as cited in the literature. In order to provide further information the number and types of trauma experienced by the group, the level of Type II trauma (Terr, 1991- see Introduction Section) and age of first trauma will also be presented. Levels of partial PTSD and the trauma type that led to the PTSD will also be examined.

3.2.1 Trauma

Table 3 illustrates that every participant in the current study had experienced at least one traumatic event according to DSM-IV criteria A. This is a higher level when compared to studies of the general population.

Table 3. Level of trauma among participants compared with the general population

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n = 28)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>60.3%</td>
<td>69%</td>
<td>84%</td>
</tr>
</tbody>
</table>

A summary of the number of traumas and type of trauma experienced among the sample is presented in Table 4 below. It can be observed from Table 4 that:

- The number of different traumatic events that fitted Criterion A per person ranged from 1-10 with a mean of 4.79
- 92.9% reported having experienced at least one type of trauma where they were a victim of a violent event
- 67.9% reported having experienced at least one trauma that fitted Criterion A
relating to them perpetrating a violent act

- 78.6% reported having experienced at least one trauma that was not violent in nature

**Table 4.** Range, mean and standard deviation of different types of traumatic events experienced by individuals*.

<table>
<thead>
<tr>
<th>Trauma Type</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>% of sample who had experienced this trauma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victim of violence</td>
<td>28</td>
<td>0-6</td>
<td>2.21</td>
<td>1.42</td>
<td>92.9</td>
</tr>
<tr>
<td>Perpetrator of violence</td>
<td>28</td>
<td>0-2</td>
<td>.86</td>
<td>.71</td>
<td>67.9</td>
</tr>
<tr>
<td>Non-violent</td>
<td>28</td>
<td>0-5</td>
<td>1.71</td>
<td>1.44</td>
<td>78.6</td>
</tr>
<tr>
<td>Any</td>
<td>28</td>
<td>1-10</td>
<td>4.79</td>
<td>2.39</td>
<td>100</td>
</tr>
</tbody>
</table>

*Type II trauma is just counted as one type of trauma – see Table 5 below for figures on levels of Type II trauma. The figures shown above are therefore likely to underestimate the actual number of traumatic incidents that certain individuals may have experienced.

A summary of those who experienced Type II trauma (Terr 1991) is presented in Table 5. It can be observed from that the majority of the sample (71.4%) reported experiencing Type II trauma.

**Table 5.** Frequency and percentage of Type II trauma.

<table>
<thead>
<tr>
<th>Type II Trauma</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>20</td>
<td>71.4</td>
</tr>
<tr>
<td>No</td>
<td>8</td>
<td>28.6</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100</td>
</tr>
</tbody>
</table>

It can be observed from Table 6 below that the age at which the first trauma occurred
ranged from 1–20 years with a mean age of 9.9 years with a standard deviation of 5.1.

**Table 6. Age at which first trauma occurred.**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of first trauma</td>
<td>28</td>
<td>1-20</td>
<td>9.9</td>
<td>5.1</td>
</tr>
</tbody>
</table>

3.2.2 PTSD

3.2.2.1 *DSM-IV diagnostic criteria*

The level of PTSD among the sample (according to strict DSM-IV criteria) is displayed in Table 7 below. A total of 32.1% of the sample fitted full DSM-IV criteria for current PTSD. This is much higher than the averages of the general population according to the Kessler et al. (1995) study shown below (2%). The figure in our sample is also higher than the exposed sample in Breslau et al.'s (1991) study.

**Table 7. Level of PTSD compared with the general population.**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>32.1%</td>
<td>2.8%</td>
<td>23.6%</td>
</tr>
</tbody>
</table>

3.2.2.2 *Trauma type*

Table 8 illustrates the type of trauma that those with PTSD reported as being the event(s) that their symptoms related to. It can be observed from Table 8 that:

- 5 out of the 9 individuals with PTSD (55.5%) had symptoms relating to more
than one type of traumatic event (e.g. flashbacks to more than one type of trauma);

- All of those who met full DSM IV criteria for PTSD, reported that at least one of the traumas involved being a victim of violence;

- 4 out of the 9 individuals with PTSD (44.5%) had symptoms relating to being both a victim and perpetrator of violence (e.g. flashbacks combining index offence with childhood abuse).

Table 8. Trauma type that PTSD relates to.

<table>
<thead>
<tr>
<th>Trauma type</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victim of violence</td>
<td>4</td>
<td>44.4</td>
</tr>
<tr>
<td>Victim and perpetrator of violence*</td>
<td>4</td>
<td>44.4</td>
</tr>
<tr>
<td>Victim of violence and a non-violent*</td>
<td>1</td>
<td>11.1</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>99.9</td>
</tr>
</tbody>
</table>

* Those who had PTSD relating to the perpetration of violence or a non-violent event also reported PTSD symptoms relating to being a victim of violence.

3.2.2.3 Partial PTSD

Sub-clinical levels of PTSD were also examined. The following figures are for the percentage of the sample who fitted the criteria for partial and full-blown PTSD according to the various definitions provided in the Introduction Section:

- 50% of the total sample according to Blanchard et al’s (1994, 1995) definition;
- 39.3% according to Green (1994) and Kilpatrick and Resnick’s (1997) definition;
- 57.1% of the sample according to Stein et al’s (1997) definition.
3.2.3 Summary

**Hypothesis 1**: A high level of trauma and PTSD was found among this sample compared with the general population. Therefore Hypothesis 1 was supported.
3.3 *Hypothesis 2: There will be a positive relationship between PTSD (arising from violent trauma) and violence (HCR-20 score)*

As mentioned earlier (under section 3.3), all of those with a PTSD diagnosis had symptoms that related to being a victim of violent trauma (Table 8). Any individual that had symptoms relating to perpetration of violence also reported symptoms relating to being a victim. An examination of symptom severity and frequency data also revealed the same trend with very little symptomology that related to solely being a perpetrator of violence. This suggested that the important factor was being a victim of a violent event. The data available does not enable this information to be disentangled. Based on the information available, an assumption is made that being a *victim* of a violent trauma appears to be the most important factor.

Different measures of PTSD symptomology were used:

1. PTSD symptom frequency and severity scores,
2. PTSD symptoms: total number and symptom type (i.e. re-experiencing, avoidance and arousal)
3. PTSD diagnosis

Total HCR-20 score was used as a measure of violence. In order to examine historical, clinical and risk factors, the sub-scales of the HCR-20 were also correlated with total number of PTSD symptoms.

3.3.1 Symptom frequency and severity (violent trauma)

Table 9 below shows that Symptom Frequency and HCR-20 score were significantly correlated at 0.01 level (r = 0.445, p = 0.009). Symptom Severity was also significantly correlated with HCR-20 score at 0.01 level (r = 0.473, p = 0.005).
Table 9. Association between Symptom Frequency and Severity Dimensions of the CAPS, and HCR-20 Score

<table>
<thead>
<tr>
<th>HCR-20 Score</th>
<th>Symptom Frequency</th>
<th>Symptom Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r = 0.445, p = 0.009</td>
<td>r = 0.473, p = 0.005</td>
</tr>
</tbody>
</table>

3.3.2 Number and type of symptoms (violent trauma)

Table 10 shows a significant association between number of PTSD symptoms and score on the HCR-20 at the 0.01 level (r = 0.498, p = 0.003). A significant correlation was found between re-experiencing symptoms and HCR-20 score at 0.05 level (r = 0.376, p = 0.024). Avoidance symptoms were found to be significantly correlated with HCR-20 score at 0.01 level (r = 0.456, p = 0.007). A significant association was also found between arousal symptoms and HCR-20 score at 0.01 (r = 0.436, p = 0.01).

Table 10. Association between Symptom dimensions on the CAPS and HCR-20

<table>
<thead>
<tr>
<th>Total number of symptoms</th>
<th>Re-experiencing</th>
<th>Avoidance</th>
<th>Arousal</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCR-20</td>
<td>r = 0.498,</td>
<td>r = 0.376,</td>
<td>r = 0.456</td>
</tr>
<tr>
<td>20</td>
<td>p = 0.003</td>
<td>p = 0.024</td>
<td>p = 0.007</td>
</tr>
</tbody>
</table>

Table 11 below illustrates relationships between total number of PTSD symptoms and the three sub-scales of the HCR-20. A significant association was found between number of PTSD symptoms and the historical sub-scale of the HCR-20 at 0.01 level (r = 0.538, p = 0.002). No significant correlation was found between number of PTSD symptoms and the HCR-20 Clinical sub-scale. Number of PTSD symptoms was significantly associated with the Risk subscale of the HCR-20 at the 0.05 level (r = 0.381, p = 0.023).
Table 11. Association between PTSD symptoms and HCR-20 sub-scale scores

<table>
<thead>
<tr>
<th></th>
<th>HCR-20 Historical</th>
<th>HCR-20 Clinical</th>
<th>HCR-20 Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of PTSD</td>
<td>( r = 0.538 ), ( p = 0.002 )</td>
<td>( r = 0.300 ), ( p = 0.061 )</td>
<td>( r = 0.381 ), ( p = 0.023 )</td>
</tr>
</tbody>
</table>

3.3.3 PTSD diagnosis

Those with a PTSD diagnosis (violent trauma) \( (n = 9) \) were compared with those without a PTSD diagnosis \( (n = 19) \) for any significant difference in HCR-20 score. Table 12 shows that those with a PTSD diagnosis had a greater mean HCR-20 score (27) than those without a PTSD diagnosis (21.68). Difference in HCR-20 score across the two groups was examined using a Mann-Whitney U Test. The results are displayed in Table 13 below and reveal that the difference was found to be significant at the 0.05 level \( (u = 41.50, p = 0.014) \).

Table 12. Mean, standard deviation and mean rank on HCR-20 of those with and without a diagnosis of PTSD (violent trauma)

<table>
<thead>
<tr>
<th>PTSD (violent)</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>19</td>
<td>21.68</td>
<td>5.94</td>
<td>12.18</td>
</tr>
<tr>
<td>Yes</td>
<td>9</td>
<td>27.00</td>
<td>5.29</td>
<td>19.39</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>23.39</td>
<td>6.18</td>
<td></td>
</tr>
</tbody>
</table>
Table 13. Results of Mann-Whitney U Test examining differences in HCR-20 score depending on PTSD diagnosis

<table>
<thead>
<tr>
<th>PTSD diagnosis (violent trauma)</th>
<th>U = 41.50</th>
<th>P = 0.014*</th>
</tr>
</thead>
</table>

*SPSS does not correct for ties however Siegel and Castellan (1988) report that the distorting effect of ties is negligible and would not alter the significance level.

3.3.4 Summary

**Hypothesis 2:** A significant relationship was found between all PTSD measures (based on being a victim of violent trauma) and violence. Number of PTSD symptoms was found to correlate significantly with the historical and risk subscales of the HCR-20 but not with the clinical subscale. Collectively these results provide support for Hypothesis 2.
3.4. **Hypothesis 3: There will not be an association between PTSD arising from non-violent trauma and violence.**

Results are presented for non-parametric correlations of the violence measure (HCR-20 score) with:

1. PTSD symptom frequency and severity scores, and
2. number of PTSD symptoms

PTSD diagnosis was not examined as there were no individuals with PTSD that reported that their symptoms related solely to a non-violent event. Due to the low level of PTSD relating to non-violent events, symptom cluster was not examined.

3.4.1 Symptom frequency and severity (non-violent trauma)

Only 5 individuals out of the sample reported any level of PTSD symptomology that related to a non-violent event and 1 of these also had symptoms relating to a violent event. As all of the sample had been violent to some extent, the low level of PTSD symptoms relating to non-violent events would indicate that there was no relationship between the two. Although numbers were low, non-parametric correlations were used to examine any relationship. Given the small numbers these correlations would need to be interpreted with some caution.

A Spearman's rho correlation was performed to examine any relationship between PTSD symptom frequency (based on non-violent trauma) and violence. No relationship between the two variables was found. A Spearman's rho correlation was also performed to examine any relationship between PTSD symptom severity (based on non-violent trauma) and violence. No relationship between the two variables was found.
Table 14. Association between Symptom Frequency and Severity Dimensions of the CAPS, and HCR-20 Score

<table>
<thead>
<tr>
<th></th>
<th>Symptom Frequency</th>
<th>Symptom Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(non-violent trauma)</td>
<td>(non-violent trauma)</td>
</tr>
<tr>
<td>HCR-20 Score</td>
<td>r = 0.005, p = 0.490</td>
<td>r = -0.003, p = 0.494</td>
</tr>
</tbody>
</table>

3.4.2. Number of symptoms (non-violent trauma)

Table 15 below shows the results from a Spearman’s rho correlation to examine any relationship between number of PTSD symptoms based on non-violent trauma and violence. No significant association was found between the two (r = 0.115, p = 0.280).

Table 15. Association between number of symptoms on the CAPS and HCR-20

<table>
<thead>
<tr>
<th>Total number of symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCR-20</td>
</tr>
<tr>
<td>r = 0.115, p = 0.280</td>
</tr>
</tbody>
</table>

3.4.3 Summary

**Hypothesis 3:** No significant relationship was found between all PTSD measures (based on a non-violent trauma) and violence. Hypothesis 3 was supported.
3.5 **Hypothesis 4: There will be a positive relationship between PTSD (violent trauma) and interference scores on the Violent Stroop.**

Different measures of PTSD were used:

1. PTSD symptom frequency and severity scores,
2. PTSD symptoms: total number and symptom type (i.e. re-experiencing, avoidance and arousal)
3. PTSD diagnosis

As discussed under section 3.3, the violent trauma refers to being a *victim* of a violent event.

3.5.1 Symptom frequency and severity

Table 16 shows associations of symptom frequency and severity with Stroop interference. It can be observed that a significant correlation between symptom frequency and Stroop interference was found at the 0.05 level ($r = 0.323$, $p = 0.047$). Symptom severity and Stroop interference were also significantly correlated at the 0.05 level ($r = 0.371$, $p = 0.026$).

**Table 16. Association between Symptom Frequency and Severity Dimensions of the CAPS, and Stroop interference**

<table>
<thead>
<tr>
<th></th>
<th>Symptom Frequency (violent trauma)</th>
<th>Symptom Severity (violent trauma)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroop interference</td>
<td>$r = 0.323$, $p = 0.047$</td>
<td>$r = 0.371$, $p = 0.026$</td>
</tr>
</tbody>
</table>

3.5.2 Number of PTSD symptoms and Stroop interference scores

From Table 17 it can be observed that there was a significant correlation between total
number of symptoms and Stroop interference score at the 0.05 level (r = 0.349, p = 0.035). No significant relationship was found between re-experiencing symptoms and Stroop interference score (r = 0.282, p = 0.073). Avoidance symptoms were found to significantly correlate with Stroop interference score at the 0.05 level. Arousal symptoms also correlated with Stroop interference score at the 0.05 level (r = 0.426, p = 0.012).

Table 17. Association between Symptom dimensions on the CAPS and Stroop interference Score

<table>
<thead>
<tr>
<th>Total number of symptoms</th>
<th>Re-experiencing</th>
<th>Avoidance</th>
<th>Arousal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroop Interference</td>
<td>r = 0.349, p = 0.035</td>
<td>r = 0.282, p = 0.073</td>
<td>r = 0.368, p = 0.027</td>
</tr>
</tbody>
</table>

3.5.3 PTSD diagnosis

Those with a PTSD diagnosis (violent trauma) (n = 9) were compared with those without a PTSD diagnosis (n = 19) for any significant difference in Stroop interference score. Table 18 shows that those with a PTSD diagnosis had a greater mean Stroop interference score (4.14) than those without a PTSD diagnosis (1.41). Difference in interference scores across the two groups was examined using a Mann-Whitney U Test. The results are displayed in Table 19 below and reveal that the difference was found to be non-significant.

Table 18. Mean, standard deviation and mean rank of interference score of those with and without a diagnosis of PTSD (violent trauma)

<table>
<thead>
<tr>
<th>PTSD (violent trauma)</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroop no</td>
<td>19</td>
<td>1.41</td>
<td>6.92</td>
<td>13.32</td>
</tr>
<tr>
<td>Interference yes</td>
<td>9</td>
<td>4.14</td>
<td>6.22</td>
<td>17.00</td>
</tr>
</tbody>
</table>
Table 19. Results of Mann-Whitney U Test examining differences in Stroop interference depending on PTSD diagnosis

<table>
<thead>
<tr>
<th>PTSD diagnosis</th>
<th>Stroop Interference</th>
</tr>
</thead>
<tbody>
<tr>
<td>(violent trauma)</td>
<td>U = 63.00</td>
</tr>
<tr>
<td></td>
<td>P = 0.143*</td>
</tr>
</tbody>
</table>

*SPSS does not correct for ties however Siegel and Castellan (1988) report that the distorting effect of ties is negligible and would not alter the significance level.

3.5.4 Summary

**Hypothesis 4:** Dimensional measures (symptom frequency, symptom severity and number of symptoms of PTSD) were found to significantly correlate with interference score on the Violent Stroop. Avoidance and arousal symptoms were significantly related to Stroop interference but re-experiencing symptoms were not. There was no significant difference between those with or without a PTSD diagnosis in terms of Stroop interference score. On the whole, the results provided support for Hypothesis 4.
3.6 Hypothesis 5: There will not be a significant association between PTSD (arising from non-violent trauma) and interference scores on the Violent Stroop

As mentioned in section 3.4.1, only 5 individuals out of the sample reported any level of PTSD symptomology that related to a non-violent event and 1 of these also had symptoms relating to a violent event. Although numbers were low, non-parametric correlations were used to examine any relationship between PTSD (arising from non-violent trauma) and interference score. As the numbers were low caution should be taken when interpreting these results.

3.6.1 Symptom frequency and severity

A Spearman's rho correlation was performed to examine any relationship between PTSD symptom frequency (based on non-violent trauma) and interference score. No relationship between the two variables was found. A Spearman's rho correlation was also performed to examine any relationship between PTSD symptom severity (based on non-violent trauma) and violence. No relationship between the two variables was found. Results are presented in Table 20 below.

**Table 20. Association between Symptom Frequency and Severity Dimensions of the CAPS, and Stroop Interference**

<table>
<thead>
<tr>
<th></th>
<th>Symptom Frequency (non-violent trauma)</th>
<th>Symptom Severity (non-violent trauma)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroop Interference</td>
<td>r = -0.070, p = 0.361</td>
<td>r = -0.070, p = 0.361</td>
</tr>
</tbody>
</table>

3.6.2 Number of symptoms (non-violent trauma)

Table 21 shows results from a Spearman's rho correlation to test association between number of PTSD symptoms (arising from non-violent trauma) and interference score.
No significant relationship was found between the two variables.

**Table 21. Association between number of symptoms on the CAPS and Stroop interference**

<table>
<thead>
<tr>
<th>Total number of symptoms</th>
<th>Stroop r = 0.034, p = 0.431</th>
</tr>
</thead>
<tbody>
<tr>
<td>(non-violent trauma)</td>
<td></td>
</tr>
</tbody>
</table>

3.6.3 PTSD Diagnosis (non-violent trauma)

As mentioned earlier, there were no individuals with PTSD that reported that their symptoms related solely to a non-violent event. Therefore comparisons between those with or without the diagnosis were not made.

3.6.4 Summary

**Hypothesis 5:** No significant association was found between any measure of PTSD (arising from non-violent trauma) and Stroop interference score. Hypothesis 5 was supported.
3.7 **Hypothesis 6: There will be a positive relationship between violence and interference scores on the Violent Stroop.**

Table 22 shows associations between HCR-20 scores (total, historical, clinical, and risk management). Total HCR-20 score was found to be significantly associated with interference score at the 0.05 level (r = 0.329, p = 0.044). The historical sub-scale of the HCR-20 was found to significantly correlate with interference score at the 0.01 level (r = 0.449, p = 0.008). No significant relationship was found between the clinical sub-scale of the HCR-20 and latency score. The risk management sub-scale of the HCR-20 was found to significantly correlate with interference score at the 0.05 level (r = 0.390, p = 0.020).

**Table 22. Association between HCR-20 and Interference Scores**

<table>
<thead>
<tr>
<th></th>
<th>HCR-20 total</th>
<th>HCR-20</th>
<th>HCR-20</th>
<th>HCR-20</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Historical</td>
<td>Clinical</td>
<td>Risk</td>
</tr>
<tr>
<td>Interference Score</td>
<td>r = 0.329,</td>
<td>r = 0.449,</td>
<td>r = 0.130</td>
<td>r = 0.390</td>
</tr>
<tr>
<td></td>
<td>p = 0.044</td>
<td>p = 0.008</td>
<td>p = 0.254</td>
<td>p = 0.020</td>
</tr>
</tbody>
</table>

**Hypothesis 6: A significant positive relationship was found between violence (as measured by the HCR-20) and interference scores on the Violent Stroop. Stroop interference score significantly correlated with the Historical and Risk Management sub-scales but not with the Clinical sub-scale. Collectively these results provide support for Hypothesis 6.**
3.8 Additional Analysis: Interaction of PTSD and violence on Stroop interference Score

As an additional analysis, an examination of any interaction between PTSD and violence on interference score was explored. Both variables were dichotomised as high or low according to mid-point scores. The numbers were too low to conduct an ANOVA that had sufficient power. Therefore Graph 1 is presented looking at the effects of any interaction. From Graph 1 it can be observed that those who are categorised as high PTSD and high Violence are showing the greatest Stroop interference. Those with the lowest Stroop interference scores (negative in fact) are the low violence and low PTSD group. The high PTSD and low violence group, and the low PTSD and high violence group are scoring similarly in terms of their interference scores.

Figure 1. Interaction effects of PTSD and violence on Stroop interference

![Estimated Marginal Means of LATENCY](image)

- **Estimated Marginal Means of LATENCY**
  - **PTSD**: low, high
  - **Violence**: low, high
3.9 Co-variants

A number of factors that may have confounded or influenced the positive relationships found between PTSD (CAPS), violence (HCR-20) and attention to threat stimuli (interference score on Violent Stroop) were identified. These were: age, length of stay in hospital, substance use, age of first trauma, number of traumas and Type II trauma. Correlations were used to examine any associations (Spearman’s rho or Pearson’s product moment, depending on whether the data fitted criteria for parametric testing or not). Mann-Whitney U Tests and Independent t tests were used to examine group differences. As directional predictions were not made, all of the following analyses have used two-tailed hypotheses. This section will focus on any significant relationships that were found among the co-variants.

3.9.1 Age

Age was not significantly associated with PTSD symptoms (arising from violent trauma), HCR-20 score or Stroop interference score.

3.9.2 Length of stay

Length of stay was not associated with PTSD symptoms (arising from violent trauma), HCR-20 score or Stroop interference score.

3.9.3 Substance use

Substance use was not significantly associated with PTSD symptoms (arising from violent trauma), violence (HCR-20 score) or Stroop interference score.
3.9.4 Age of first trauma

3.9.4.1 Age of first trauma and PTSD (arising from violent trauma)

Table 23 shows that a significant association was found between symptom frequency and age of first trauma at the 0.01 level ($r = -0.549$, $p = 0.002$). A significant association was also found between symptom severity and age of first trauma at 0.01 level ($r = -0.551$, $p = 0.002$). Total number of PTSD symptoms was significantly associated with age of first trauma at 0.001 level ($r = 0.592$, $p = 0.001$).

In all of these cases the significant relationships are inverted, indicating that the lower the age of first trauma, the greater the PTSD symptoms.

Table 23. Association between Symptom Frequency, Symptom Severity and Total Number of Symptoms on the CAPS, and age of first trauma

<table>
<thead>
<tr>
<th>Age of first trauma</th>
<th>Symptom Frequency (violent trauma)</th>
<th>Symptom Severity (violent trauma)</th>
<th>Total number of symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$r = -0.549$, $p = 0.002$</td>
<td>$r = -0.551$, $p = 0.002$</td>
<td>$r = 0.592$, $p = 0.001$</td>
</tr>
</tbody>
</table>
3.9.4.2  *Age of first trauma and PTSD diagnosis*

No significant difference in age of first trauma was found between those with or without a diagnosis of PTSD.

3.9.4.3  *Age of first trauma and violence*

Table 24 shows that a significant association was found between age of first trauma and HCR-20 score at 0.05 level \( r = -0.386, p = 0.043 \).

<table>
<thead>
<tr>
<th>Table 24. Association between HCR-20 and age of first trauma</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCR-20</td>
</tr>
<tr>
<td>Age of first trauma</td>
</tr>
</tbody>
</table>

3.9.4.4  *Age of first trauma and Stroop interference scores*

No significant association was found between Stroop interference score and age of first trauma.

3.9.4.5  *Age of first trauma and total number of traumas reported*

No significant association was found between age of first trauma and total number of traumas reported.

3.9.4.6.  *Age of first trauma and number of violent traumas experienced*

A Pearson's Product Moment correlation was conducted to examine the relationship between age of first trauma and number of violent traumas experienced. Table 25 below
reveals a significant association between the two variables at 0.05 level (Pearson = -0.385, p = 0.043).

Table 25. Association between age of first trauma and number of violent traumas

<table>
<thead>
<tr>
<th>Number of violent traumas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of first trauma</td>
</tr>
<tr>
<td>r = -0.385, p = 0.043</td>
</tr>
</tbody>
</table>

3.9.5 Total number of traumas

Total number of traumas experienced was not significantly correlated with PTSD symptoms, HCR-20 score or Stroop interference score.

3.9.6 Number of violent traumas

3.9.6.1 Number of violent traumas and PTSD symptoms

Table 26 below illustrates results from Spearman’s rho correlations examining relationships between measures of PTSD (violent trauma) and number of violent traumas. Table 26 shows that a significant association was found between symptom frequency and number of violent traumas at the 0.01 level (r = -0.521, p = 0.004). A significant association was also found between symptom severity and number of violent traumas at 0.01 level (r = 0.539, p = 0.003). Total number of PTSD symptoms was significantly associated with number of violent traumas at 0.01 level (r = 0.529, p = 0.004).
Table 26. Association between Symptom Frequency, Symptom Severity and Total Number of Symptoms of the CAPS, and number of violent traumas

<table>
<thead>
<tr>
<th>Symptom Frequency (violent trauma)</th>
<th>Symptom Severity (violent trauma)</th>
<th>Total number of symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of violent traumas</td>
<td>r = 0.521</td>
<td>r = 0.539, p = 0.003</td>
</tr>
<tr>
<td></td>
<td>p = 0.004</td>
<td>r = 0.529, p = 0.004</td>
</tr>
</tbody>
</table>

3.9.6.2 Number of violent traumas and PTSD diagnosis

No significant difference was found between those with or without a PTSD diagnosis in terms of number of violent traumas experienced.

3.9.6.3 Number of violent traumas and Violence

No significant relationship was found between number of violent traumas and violence.

3.9.6.4 Number of violent traumas and Stroop interference score

No significant relationship was found between number of violent traumas and Stroop interference score.

3.9.7 Type II Trauma

3.9.7.1 Type II Trauma and PTSD symptoms

Table 27 shows that a significant difference was found between those who had and had not experienced Type II Trauma in terms of symptom frequency at the 0.05 level (u = 39, p = 0.038) with those with Type II experiencing PTSD symptoms more frequently. No significant difference was found between the two groups in terms of symptom...
severity. Number of PTSD symptoms was significantly greater among those who had experienced Type II Trauma at 0.05 level ($r = 0.529$, $p = 0.049$).

**Table 27.** Results of Mann-Whitney U Test examining differences in PTSD symptoms depending on whether group had experienced Type II Trauma.

<table>
<thead>
<tr>
<th></th>
<th>Symptom Frequency</th>
<th>Symptom Severity</th>
<th>Number of symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type II Trauma</td>
<td>$U = 39.00$</td>
<td>$U = 42.00$</td>
<td>$U = 41.50$</td>
</tr>
<tr>
<td></td>
<td>$P = 0.038^*$</td>
<td>$P = 0.055^*$</td>
<td>$P = 0.049^*$</td>
</tr>
</tbody>
</table>

*SPSS does not correct for ties however Siegel and Castellan (1988) report that the distorting effect of ties is negligible and would not alter the significance level.

### 3.9.7.2 Type II trauma and violence

No significant difference was found between those who had and had not experienced Type II trauma in terms of HCR-20 score.

### 3.9.7.3 Type II trauma and Stroop interference

No significant difference was found between those who had and had not experienced Type II trauma in terms of Stroop interference score.

### 3.9.8 Summary

- Age was not significantly associated with PTSD symptoms (arising from violent trauma), HCR-20 score or Stroop interference score
- Length of stay was not associated with PTSD symptoms (arising from violent trauma), HCR-20 score or Stroop interference score
- Substance use was not significantly associated with PTSD symptoms (arising
from violent trauma), violence (HCR-20 score) or Stroop interference score.

- Age of first trauma was significantly related to PTSD symptoms and HCR-20 score. The younger the age of first trauma, the greater the PTSD symptoms and violence (HCR-20 score). Age of first trauma was not significantly associated with Stroop interference score.

- Total number of traumas experienced was not significantly correlated with PTSD symptoms, HCR-20 score or Stroop interference score.

- Number of violent traumas was significantly associated with PTSD symptoms but not with PTSD diagnosis. Number of violent traumas was not significantly associated with violence or Stroop interference score.

- Those who had experienced Type II trauma had greater PTSD symptom frequency and number of PTSD symptoms than those who had not. There was no difference in PTSD symptom severity, HCR-20 score and Stroop interference score among those who had or had not experienced Type II trauma.
3.10 Comparison of participants with those who declined.

3.10.1 Age

A comparison of age between the two samples is presented in Table 28 below. Table 28 reveals that the age range of the “declined” group (22-68 years) was slightly broader than the “participant” group (24-55 years). The mean age of the “declined” group (43.9 years) was also slightly older than the “participant” group (38.7 years) however an independent \( t \) test revealed that this difference was not significant (\( t = 1.717, \) df = 44, sig = 0.093).

<table>
<thead>
<tr>
<th>GROUP (in yrs)</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGE Declined</td>
<td>18</td>
<td>22-68</td>
<td>43.9</td>
<td>11.97</td>
</tr>
<tr>
<td>Participant</td>
<td>28</td>
<td>24-55</td>
<td>38.7</td>
<td>8.59</td>
</tr>
</tbody>
</table>

3.10.1 Length of stay

A comparison of length of stay in the hospital was conducted and the results are displayed in Tables 29 and 30 below. From Table 30 it can be observed that the range of stay within the hospital was fairly similar between the two groups with the lowest length of stay 1 year (in participant group) and the highest 38 years (declined group). The mean length of stay was higher in the “declined” group (16.6 years) than the “participant” group (9.4 years). Using an independent \( t \) test, this difference was found to be significant at \( p < 0.05 \) (\( t = 2.351, \) df = 40, sig =0.024).
Table 29. Range, mean and standard deviation of length of stay

<table>
<thead>
<tr>
<th>GROUP</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Declined</td>
<td>14</td>
<td>2-38</td>
<td>16.6</td>
<td>12.15106</td>
</tr>
<tr>
<td>Participant</td>
<td>28</td>
<td>1-31</td>
<td>9.4</td>
<td>7.64565</td>
</tr>
</tbody>
</table>

Table 30. Showing results from an Independent t test examining differences in length of stay

<table>
<thead>
<tr>
<th>Levene's Test for</th>
<th>t-test for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equality of Variances</td>
<td>Equality of Means</td>
</tr>
<tr>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td>8.987</td>
<td>.005</td>
</tr>
<tr>
<td>Equal variances</td>
<td></td>
</tr>
<tr>
<td>Assumed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.025</td>
</tr>
<tr>
<td>Equal variances</td>
<td></td>
</tr>
<tr>
<td>Not assumed</td>
<td></td>
</tr>
</tbody>
</table>

3.10.2 HCR-20

Descriptive statistics are shown in Table 31. Comparison of scores on the HCR-20 revealed similar ranges between the two groups (declined at 13-28, participant at 10-31). The "declined" group had a lower mean score (19.94) than the "participant" group.
A Mann-Whitney U test revealed that this difference was significant at $p < 0.05$ ($U = 157.500$, sig. = 0.033). Results are displayed in Table 32.

Table 31. Differences in HCR-20 score across the groups who declined or participated in the study

<table>
<thead>
<tr>
<th>GROUP</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCR-20 score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>declined</td>
<td>18</td>
<td>13-28</td>
<td>19.94</td>
<td>4.684</td>
<td>18.25</td>
<td>328.50</td>
</tr>
<tr>
<td>participant</td>
<td>28</td>
<td>10-31</td>
<td>23.39</td>
<td>6.178</td>
<td>26.88</td>
<td>752.50</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 32. Results from Mann-Whitney U Test examining differences in HCR-20 scores

<table>
<thead>
<tr>
<th>HCR-20</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Declined or participated</td>
<td>U = 157.500</td>
<td>P = 0.033</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3.10.3 Ethnic status

A comparison of ethnic status between the two groups is shown in Table 33 below. It can be observed that both groups were predominantly White British in terms of their ethnic status ("declined" = 94.4%, "participant" = 89.29).

Table 33. Breakdown of ethnic status among those who declined and participated in the study

<table>
<thead>
<tr>
<th>Ethnic Status</th>
<th>declined</th>
<th>participant</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td><strong>White British</strong></td>
<td>17</td>
<td>94.4</td>
</tr>
<tr>
<td><strong>White Irish</strong></td>
<td>1</td>
<td>5.06</td>
</tr>
<tr>
<td><strong>Black Caribbean</strong></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Mixed White and Asian</strong></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Any Other Mixed Background</strong></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>18</td>
<td>100</td>
</tr>
</tbody>
</table>

3.10.4 Summary

- There was no significant age difference between the two groups

- Those who declined to take part in the study had spent significantly longer as patients in the hospital than those who participated

- Those who declined to take part in the study had significantly lower HCR-20 scores than those who agreed to take part

- There appeared to be no major difference between the two samples in terms of ethnic status. The majority of both groups were described as White British.
4. DISCUSSION

This section will summarise and discuss the findings, examining each hypothesis in turn. Findings from the additional analysis and co-variants will be explored. Interpretation of the results will be offered and an exploration of competing explanations will be given. A critical review of the study will be given and clinical implications will be discussed. Areas for future research will be identified throughout.

4.1 Summary and discussion of results

4.1.1 Hypothesis 1

Consistent with previous studies (e.g. Lewis, 1989; Boswell, 1995), high levels of trauma were found among a group of violent offenders, with every participant having experienced at least one traumatic event according to DSM-IV Criteria A. An overwhelming majority of the sample had been victims of violence at some point with also high levels of non-violent trauma reported. The percentage of individuals who reported that perpetration of violent acts had been traumatic was similar to that found by Kruppa et al (1995) (72% in Kruppa et al’s study compared with 67.9% in the current study). The group were also largely characterised by having experienced multiple traumas. Most of the sample had experienced their first trauma in childhood. There was also a high level of Type II trauma (Terr 1991) among the group of violent offenders which provides some support for Terr’s (1991) assertion that prolonged and repeated exposure to trauma is associated with rage.

Almost one third of the group of violent offenders fitted the full DSM-IV criteria for PTSD. This figure is much higher than the level of PTSD among a normal population (e.g. Breslau et al, 1991) but is comparable to levels among samples exposed to violent trauma (e.g. De Girolamo and McFarlane, 1996). However, the level of PTSD found in this current research is higher than Kruppa et al’s (1995) study who used a similar population (maximum security hospital patients legally classified with psychopathic disorder) and found that 22% of the sample fitted a current diagnosis of PTSD.
Differences in the levels found between Kruppa et al’s (1995) and the current study may be due to the different instruments used to measure PTSD. Kruppa et al (1995) used the PTSD Interview Schedule, as opposed to the CAPS used in the current study. The two samples used in the study differed in that Kruppa et al (1995) used a mixed male and female sample whereas the current study used an all male sample. However, from previous research studies it would be expected that an all male sample may have reported less PTSD than a mixed sample, as PTSD is found to be more common among women (Kessler et al, 1995). Kruppa et al’s (1995) sample was also larger (n = 44) than the current sample (n = 28). An alternative interpretation for the increased level of PTSD reported among this sample is that compared to older studies, it may be increasingly acceptable and less taboo to disclose traumatic experiences and their effects, especially among men.

All of those with a PTSD diagnosis cited violent victimisation as traumatic. However over half of those with a PTSD diagnosis reported having symptoms that related to more than one trauma. Certain re-experiencing symptoms (flashbacks and nightmares) were described as incorporating more than one traumatic event, sometimes in an interwoven fashion. This suggests that people who have experienced multiple traumas may present with more complex PTSD.

Levels of partial PTSD ranged from 37.3 – 57.1% of the sample depending on the definition used (see Introduction Section). This indicates that a high level of PTSD symptomology, possibly warranting clinical intervention, exists among this sample.

Although age at first trauma was not significantly different among those with or without PTSD diagnoses, it was related to dimensional measures of PTSD. The earlier the age that the first trauma occurred, the greater the level of PTSD symptom frequency, severity, and number of symptoms. One possibility for this is that the earlier the age when trauma is experienced, the more likely that a PTSD reaction may occur due to developmental reasons. For instance, Norris (1992) found highest rates of PTSD to be among young people. Another possibility for this relationship was that the earlier the first trauma occurred, the more exposure to trauma the person may have experienced hence increasing the likelihood of PTSD. This explanation was explored and it was found that age at first trauma was not significantly related to number of total traumas
but was significantly related to number of violent traumas experienced. However, there was no significant difference in terms of age of first trauma between those who had and had not experienced Type II trauma. This may have been due to the low numbers of those who had not experienced Type II Trauma. Total number of traumas did not increase likelihood of PTSD symptoms but number of violent traumas experienced was positively related to higher levels of PTSD symptomology. Those who had experienced Type II trauma experienced significantly more frequent symptoms and number of symptoms than those who had not. Collectively these results suggest that increased exposure to violent trauma is related to greater PTSD symptomology.

4.1.2 Hypotheses 2 and 3

As predicted, a positive significant relationship was found between all measures of PTSD (arising from violent trauma) and violence. As mentioned in the Results Section, all of those with a PTSD diagnosis had symptoms that related to being a victim of violent trauma (Table 8, Section 3.2.2.2). Any individual that had symptoms relating to perpetration of violence also reported symptoms relating to being a victim. The same trend was apparent for symptom severity and frequency data with very little symptomology that related to solely being a perpetrator of violence. It appeared that the important factor was being a victim of a violent event. The data did not enable victimization and perpetration to be disentangled. Based on the information available, the assumption was made that being a victim of a violent trauma appeared to be the most important factor. No relationship was found between non-violent PTSD and violence.

The violence measure used, the HCR-20, was significantly related to each cluster of symptoms (re-experiencing, avoidance and arousal) when the PTSD arose from violent trauma. This raises the possibility that more than one pathway may link PTSD (relating to violent victimisation) with violent behaviour. Case studies have been cited by Silva et al (1998) that have linked re-experiencing / dissociative symptoms with perpetration of violent acts. Perpetrators of violence with PTSD have misidentified strangers as being “the enemy”.
Another possible pathway may be associated with memories of trauma. Trauma-specific information tends to be more readily activated from memory (review by Thrasher and Dalgleish, 1999), and in the case of violent trauma, that information is likely to have a violent content. It has been demonstrated that violent solutions to social situations are also likely to be generated from memory among victims of violence who are aggressive (Dodge et al, 1995).

Chronic emotional numbing and feelings of detachment from others (avoidance symptom cluster) found among PTSD patients may make someone less empathic of others, empathy being considered a quality that usually acts as an inhibitor for violence towards others. Future research could explore the link between PTSD, empathy and violence.

Feelings of shame and guilt resulting from violent victimisation may elicit revengeful thoughts and anger that could act as a precursor to acts of aggression (Tangey, Wagner, Fletcher, and Gramzow, 1992). There may be an overlap or conjoint activation of arousal symptoms of PTSD with anger that may provide a link between PTSD and violence (Chemtob et al, 1997). That violence correlated with all three symptom clusters of PTSD illustrates that it is not only the arousal symptoms that is related to violence. (It could be argued that there is some overlap or circularity in terms of the item under arousal symptoms that refers to anger and irritability).

Number of PTSD symptoms was found to be significantly related to the historical and risk management subscales of the HCR-20 but not to the clinical one. One possible reason for this is that the historical and risk management sub-scales have been more closely related to violence than the clinical sub-scale (Douglas et al 1996, Douglas, 1996 cited by Webster et al, 1997). Alternatively, as the HCR-20 data had been collected some months earlier than the current study, the clinical sub-scale may have been affected by the time difference. Therapeutic work may have reduced scores on the clinical sub-scale while having less or no impact on the other scales.

Analysis of possible covariants to explain other links between PTSD and violence revealed that age of first trauma was found to be significantly associated with both PTSD symptoms (as discussed earlier) and violence. Number of violent traumas was
related to PTSD symptoms but not to violence. Type II trauma was significantly related to frequency and number of PTSD symptoms but was not related to violence. Analysis of other possible co-variants revealed that age, length of stay in hospital and substance use was not related to PTSD or violence.

As the data is correlational, no causative links can be concluded. Nevertheless, several interpretations for these results may be offered. A summary diagram illustrating the significant associations found between PTSD and violence is provided in Diagram 1 below.

**Figure 2. Significant associations between trauma, PTSD (violent trauma) and violence.**

One interpretation is that early age at first trauma and exposure to multiple violent traumas increases the likelihood of developing PTSD symptoms and that having PTSD (relating to violent victimisation) increases risk of violent behaviour. This explanation is consistent with the argument that social learning theories of violence may be incomplete and that PTSD–like symptoms may account for aggressive behaviour seen in victims of violent trauma (Hodge 1992, 1997; Dutton, 1997).
A second interpretation is that early age of trauma increases the likelihood of being aggressive as a child (aggression in childhood may persist to adulthood [Rutter et al, 1998]) and that being aggressive heightens risk of exposure to violent trauma and subsequently developing PTSD. However, in this study PTSD symptoms were related to exposure to violent trauma but violent behaviour was not. The critical factor appeared to be presence of PTSD symptoms, and these tended to be based on violent victimisation in childhood.

A third interpretation is that aggression in childhood (that is perhaps based on biological factors) increases the risk of early exposure to trauma and level of exposure to violent trauma (e.g. the risk of the child being physically abused) which in turn would increase risk of PTSD. Previous studies show limited support for this hypothesis in that previous studies have controlled for temperament in childhood and have still found links between child abuse and later aggressive behaviour in children (Dodge et al, 1995).

A fourth interpretation is that early exposure to trauma increases the risk of both PTSD and violence developing (and that PTSD and violence are not directly related). It may, for example, be that trauma occurring at a certain age and stage of development may affect brain chemistry or structure that heightens risk of both chronic PTSD and aggression. Lewis (1992) argues that the fact that adverse environmental experiences affect aggression does not exclude the possibility that the links are mediated, at least in part, biologically.

A fifth interpretation is that there may be another third factor that accounts for these relationships. For example early exposure to trauma may heighten risk of another variable (such as personality disorder, substance use or mental illness) that is related to both PTSD and violence. While attempts were made to minimise for some possible confounding or covariant factors, there are specific variables that were not controlled for that may explain the relationships found in the current study. These will be discussed further under the section 4.2.

Five possible explanations for the relationship between PTSD and violence have been offered and discussed. Further research, preferably longitudinal studies, would be
required to test further the hypotheses offered.

4.1.3 Hypotheses 4 and 5

As predicted in the introduction, dimensional measures of PTSD arising from violent trauma were significantly associated with greater Stroop interference for violent words. Stroop interference was shown to increase with symptom frequency, severity and number of symptoms. No relationship was found between PTSD symptoms that related to non-violent trauma and Stroop interference. However those with a PTSD diagnosis (based on violent trauma) did not show greater Stroop interference than those without. It may be that the numbers in the PTSD group were low (n = 8) and there was a high level of PTSD symptomology among those who fell just short of fitting all DSM IV criteria. Nevertheless, on the whole these results are consistent with other studies that suggest that individuals with PTSD symptoms show greater Stroop interference for trauma-specific words.

Stroop interference was significantly related to avoidance and arousal symptoms but not to re-experiencing. This would appear to contradict McNally et al’s (1990, p. 398) argument that “interference produced by trauma-related words may provide a quantitative index of intrusive cognitive activity...” given that intrusive thinking falls within the cluster of re-experiencing symptoms. In order to examine McNally et al’s (1990) argument further, the relationship between specific symptom of intrusive thinking and Stroop interference would need to be examined further.

Age of first trauma, total number of traumas, number of violent traumas or Type II Trauma did not show any significant relationship with Stroop interference. Therefore it would appear that Stroop interference appears to be related to presence of PTSD symptoms as opposed to exposure to violent trauma, per se.

No other possible covariant that was examined (age, length of stay in hospital, substance use) was related to Stroop interference.
4.1.4 Hypothesis 6

Stroop interference for violent words was found to increase with level of violence. This is consistent with Smith and Waterman’s (in press) study that found violent offenders showed greater Stroop interference for violent words than non-violent offenders or students. The Stroop effect would appear to be particularly sensitive given that within the current study, all were violent to some extent and the Stroop interference was significantly related to severity or level of violence within the group.

4.1.5 Additional analysis

An examination of any trends of an interaction between PTSD and violence having an increased effect on Stroop interference was undertaken. This revealed that those with high PTSD symptoms and high levels of violence seemed to have the longest Stroop interference. This tentatively suggests that these individuals may be especially prone to selectively processing violent stimuli in their environment. Given that selective processing of violent stimuli has been considered a stage involved in violent responding (Dodge et al, 1995), it could be argued that presence of PTSD symptoms among violent offenders may increase their risk of further violent behaviour. A further study could be conducted to test this hypothesis. For instance, a PTSD and non-PTSD group of violent offenders could be compared for incidences of violence in a prospective study.

4.1.6 Comparison of participants with those who declined

As in all research where participants are recruited on a voluntary basis, there is arguably an immediate bias in the sample, in that those who volunteer may be significantly different from those who did not. A comparison of the two groups found that they did not differ significantly in terms of age and ethnic status. However the group who took part in the study had spent a significantly shorter time in hospital than those who declined. One possible explanation for this is that the longer a patient stays in hospital, the more research they are likely to have been asked to engage in. As one of only three Special Hospitals in England and Wales, the client group is fairly specialised and are frequently asked to be involved in research. Indeed some of those who declined gave
the reason that they had recently undertaken other research projects. Other possible explanations are that those who were in hospital for longer were more likely to have more entrenched problems, be institutionalised, less motivated or amenable to change, or possibly disillusioned with the system hence not wishing to engage in research projects. It could be that those who declined were less likely to have addressed their difficulties, and the sensitive nature of the research project may not have been an appropriate forum to do so (e.g. if someone had not previously disclosed abuse). This was true for at least one of the patients who, when he declined, reported that he had only recently made a disclosure of childhood sexual abuse and was undergoing legal action and therapy.

A second significant difference between the two groups was that those who agreed to take part in the research were significantly more violent according to HCR-20 score. One possible reason for this is that as the project was looking at addressing violent behaviour, those for whom it was more of a problem may have been more likely to volunteer. As the sample who volunteered were generally more violent, the generalisability of the study may be questionable. As PTSD was significantly related to the violence measure it might be possible that PTSD levels were higher in the sample used than in the declined group.

4.2 Criticisms

This was a preliminary study that brought together a number of disparate areas of research, among a complex client-group. Therefore, it is possible to highlight a number of methodological criticisms with the study that were largely encountered due to the limitations of carrying out research within the context of a Doctorate of Clinical Psychology.

One limitation of the current study is that the sample was fairly small and specialised hence the generalisability of the findings to other populations is questionable. As identified earlier, the group used in the study were significantly more violent than those who declined. This also raises the question of the study's generalisability. Nevertheless the fact that, even among a small sample, significant associations were found between
PTSD symptoms, violence and selective processing of threat indicates that the results warrant further investigation at a wider level.

The Stroop Test used in the current study was not used with a non-clinical sample. It is not known whether different groups of individuals would show different levels of Stroop interference on the test. However, in their version of the violent Stroop, Smith and Waterman (in press) found that offenders to have significantly greater Stroop interference than non-offenders. The version of the Stroop that was used in the current study also did not control for general negative emotionality of words. However, Smith and Waterman (in press) controlled for negative words and still found that violent offenders showed greater Stroop interference for violent words in particular.

A limitation of the study was that the HCR-20 data that was used had been gathered prior to other data and that may have affected the accuracy of the clinical sub-scale as any recent changes would not have been accounted for. However, it was argued in the Method Section that significant clinical changes within this client-group (severe personality disorder) tend to occur over a course of years rather than months.

Another criticism that could be levelled at the study is the retrospective nature of the design. The reliability and validity of people's memories, especially when reporting childhood events, may be questionable. It could be argued that offenders in particular may be motivated to report trauma to detract or excuse their own criminal acts. However, Brewin, Andrews and Gotlib (1993) have reported that adult's self-report data on major childhood events tends to be accurate.

With a complex client group it is difficult to control for the numerous factors that may relate to PTSD and violence. Earlier it was argued that the significant links found in this study may have been due to a third factor. For instance, although all of the sample were diagnosed with personality disorder, hence providing a reasonably homogenous group, a possible criticism is that type and severity of personality disorder was not controlled for. At a practical level, personality inventories were not given due to limitations in administration time. Conceptually, it could be argued that personality disorder would not necessarily be a third factor but interwoven into experiences of trauma and violent behaviour, this would be especially likely for the diagnoses of borderline and antisocial
personality disorder. Although it was not the focus of the research, the finding that the entire group reported at least one trauma and that this group of violent offenders all had diagnoses of personality disorder, may provide some support for the idea that trauma may be implicated in the development of personality problems (e.g. Herman, Perry and van der Kolk, 1989).

The factor of clinical psychopathy (Cleckley, 1976; Hare, 1991) was also not controlled for (although the HCR-20 includes this as a potential risk marker for violence). Psychopathy has been found to be predictive of violent re-offending (see meta-analysis by Hemphill, Hare and Wong, 1998). Experimental studies have also found that differences exist between clinical psychopaths and controls on measures of emotional processing (reported in Mitchell and Blair, 2000). Future studies might examine this variable and its relationship to PTSD, violence and selective processing of violent stimuli.

Another possible factor that was not controlled for was neuropsychological deficits. The effects of this variable was minimised in that those with a known head injury or learning disability were excluded from the study. Nevertheless, there are some arguments that neurological problems may link trauma with aggression (Lewis 1992). Future research may include an examination of neuropsychological variables and any relationship between PTSD and violence.

Although those with major mental illness were excluded from the research, other psychiatric symptoms (e.g. depression, other anxiety disorders etc.) were not controlled for. It is known that a high level of co-morbidity is found among PTSD patients (Kessler et al, 1995) therefore some of the links found in this study may be due to other psychiatric symptoms that were not screened for. For example, there is some evidence that depression may be linked to serious violent acts (review by Howells, 1982). Nevertheless it has been argued that the presence of PTSD with other psychiatric conditions are not strictly co-morbid but are inter-linked (Deering et al, 1996).

A possible third factor that may have accounted for the link between PTSD and violence was substance use. In the current study substance use was examined as a possible confounding variable and was found to not be significantly related to PTSD or
violence. Nevertheless there is an abundance of evidence that has identified a link between alcohol and aggression (e.g. McMurran 1999). There is also a body of evidence linking substance use and PTSD (e.g. Chilcoat and Breslau, 1998). It should be noted that the instrument used to measure substance use in this study is still undergoing psychometric validation. In its favour, the tool was specifically designed for a high security setting and it is well established that current measurement tools for substance use are neither appropriate nor validated within the context of a secure setting (McMurran, 2001).

A further criticism that could be levelled at the study is that sexual and non-sexual violence were not examined separately. The reason for this is that the instrument used to measure violence in this research, the HCR-20, groups sexual and non-sexual violence together. For the purposes of this research it was decided to use a consistent definition of violence throughout the study. Nevertheless, it is accepted that there may be significant differences in both perpetrators and victims of sexual and non-sexual violence. Future studies could look at a breakdown of violent trauma type though in practical terms it may be difficult to separate out the components as sexual violence may also involve physical violence.

4.3 Clinical implications

The findings of the current study may have clinical implications at numerous levels. This includes specific implications for assessment and intervention, preventative work, policy, and staff training.

In the arena of serious offenders there are a number of different stakeholders and there are ethical considerations involving public protection, punishment, security, and rehabilitation. Although it is known that the most damaging of individuals tend to come from the most traumatic of backgrounds, when terrible crimes are committed it may be difficult to acknowledge this link (Smith, 2000). Explanation may be viewed as excuse. Repeated dissemination of such research findings may help improve understanding of violent behaviour that is essential to the prevention of such criminal acts and the rehabilitation of such individuals who commit them.

In response to her finding that there was a high level of trauma among young offenders,
Boswell (1995) made a series of recommendations concerning crime prevention. She suggested that, given the level of childhood trauma found among offenders, a longitudinal study identifying which childhood trauma victims go on to become serious offenders could help improve early interventions. Education and publicity within the community about the links between trauma, PTSD and offending may help encourage the reporting and recognition of violent trauma and its possible effects. Boswell (1995) argued that specialist knowledge should be communicated clearly to the wider community in straightforward language. Boswell (1995) also argued that the current system of criminalizing and incarcerating young offenders often results in ignoring the underlying reasons why the offending behaviour occurred. She argued that where unresolved trauma is apparent, individuals should be offered PTSD counselling. The current study would provide further support for Boswell’s (1995) recommendations.

The high level of PTSD found among participants in this study would warrant a more systematic and routine screening of PTSD symptomology among perpetrators of violence. It is not yet known whether the treatment of PTSD among violent offenders would best be addressed prior to dealing with offending behaviour; as part of an integrated model examining the underlying functions of violence; or after offending behaviour has been addressed. It could be possible that addressing a person’s offences without first dealing with any PTSD may result in re-traumatisation of the patient. Within the present system, where possible PTSD is often overlooked, individuals could potentially be viewed as “untreatable” or “unmotivated” when, in reality, they may actually be refusing to engage in offence-based work due to active avoidance of issues relating to trauma.

The results of this study would suggest that the preferred option would be to examine PTSD in terms of its relationship with violence. The principles used in Chemtob et al’s (1997) cognitive action model of anger and PTSD among combat veterans may also be applicable to violent offenders. In their work with war veterans, Chemtob et al (1997) describe how they firstly educate the patient about how PTSD patients shift into “survival mode” and describe its characteristics (see Introduction). They explain how activation of anger arousal may be central to this shift. The client is introduced to the various components of Novaco’s (1994) model of anger. The patient is educated about how anger was once functional as part of a survival mode but is now partly dissociated. The intervention encourages the patient to re-attach anger to a functional context using
self-monitoring as a regulatory tool. Rather than using war as the precipitating trauma, the function of anger and aggression in terms of its relationship to "surviving" violent victimization (especially of the prolonged, repeated and anticipated nature of violent trauma found among the majority of violent offenders in this study) may be examined.

Various possible pathways have been identified between PTSD and aggression earlier in this section. An assessment of specific PTSD symptoms and their relationship to violence may identify those different pathways that are relevant to different individuals. For example, if a violent PTSD patient displays hypervigilance to violent situations due to earlier experiences of being victimised, the connections between this PTSD symptom and the propensity for responding aggressively to minor provocation may be explored. Alternatively, a violent PTSD patient who finds it difficult to experience emotion or has a foreshortened sense of future relating to earlier violent trauma may be less empathic to others or feel that he has nothing to lose by being violent. These links may be identified at assessment and specifically designed interventions may be developed to work on both violent behaviour and PTSD concurrently.

At present it is still early days to start suggesting the utility of the Stroop Test in routine clinical assessment, as a possible risk assessment instrument, or as an outcome measure. These may be possible future uses given further research in this area. The use of reaction time tests are becoming increasingly of interest to both researchers and clinicians. The reaction time paradigm may be a step forward in providing more "objective" data that could be used as an adjunct to self-report data that clinical psychology relies heavily upon. At present the impressive results from research examining the Stroop effect among clinical groups may help improve our understanding of the mechanisms that underlie emotional disorders. Identifying the possible mechanisms that lead to the cognitive biases observed in clinical conditions may provide further knowledge to tailor interventions more successfully.
4.4 Dissemination

It is intended that the results of this study will be summarised in a written report that will be disseminated to the Hospital's ethics committee, managers of the Personality Disorder Service at the hospital where the patients were recruited, and to each of the wards within the Personality Disorder Service whereby a copy will be made available to both staff and patients. A presentation of the results will be given to a local multi-agency Youth Offending Team using, as Boswell (1995) recommends, straightforward language. It is intended that this research will be written up for publication in a peer-reviewed journal.
5. REFERENCES


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Appendix 1.

Consent Form
CONSENT FORM

Title of project: Post-traumatic stress disorder and violence: the selective processing of threat cues.

Investigator: Maria Marshall

Part 1

I ...................................................... agree to take part in the above study as described in the Patient Information Sheet. I am satisfied that the purpose and procedures of the study have been fully explained to me by Maria Marshall. I have also received a copy of the Patient Information Sheet.

I understand that my involvement in the study will be confidential, without prejudice to me and when the study is written up it will not be possible to identify me. I understand that I do not have to take part in the study and that I can withdraw at any time and it will not stand against me.

Signed ..................................................... Date ........../........./........

Witnessed .................................................. Date ........../........./........

Part 2 – Section A

I .......................................................... Responsible Medical Officer to hereby give my approval to the involvement of the above-named patient in the research project conducted by ..................................................... I have received a written explanation of the study.

Signed ..................................................... Date ..............................

Part 2 – Section B

I .......................................................... Responsible Medical Officer to am satisfied that the patient is capable of giving consent to his/her involvement in the proposed research project.
Part 3 – to be retained by the patient

I, Maria Marshall, confirm to ................................................................................................
that all information relating to him in the study will be confidential and without
prejudice to him / her.

Signed ................................................................. Date..............................................
Appendix 2.

Patient Information Sheet
PATIENT INFORMATION SHEET

Title: Post-traumatic stress disorder and violence: selective processing of threat cues.

Investigator: Maria Marshall

I am asking patients to take part in the above project. The purpose of the research is to look at better ways to help people who have been violent or had stressful life experiences.

I would be very grateful if you could help me with this research. If you agree, I will meet with you for about 1 to 1 ½ hours.

Any information you give will remain strictly confidential and when the study is written up it will not be possible to identify you. Any information you give me will be kept securely and destroyed once the research has been completed. Some things might be difficult to talk about and if you choose not to take part it will not stand against you or your treatment.

If you do agree to take part, you will be asked about past stressful experiences and any difficulties you have relating to these. All information given will be treated in a sensitive way. You do not have to answer anything that you do not want to. If at first you agree to take part, you are free to change your mind at anytime. If at anytime during the meeting you want to stop, then that will be OK.

I will be in contact soon to see if you want to take part or not and this will also give you the chance to ask me any questions you might have.

Thank you, in anticipation, for your help.

Maria Marshall
Trainee Clinical Psychologist
Appendix 3.

Violent Stroop
Appendix 4.

Emotionality Rating Scale
As part of my research, I am devising an emotional stroop test. I require a set of "neutral" words and am looking for independent ratings. I would be grateful if you could help me by filling in this form.

Please rate the following words on their emotionality (0=not at all emotional, 5=very emotional): (Please circle the appropriate number)

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Thank you very much for your help,
Maria Marshall, Trainee Clinical Psychologist
Appendix 5.

Substance Use Screening Tool (SUST)
1. Have you ever felt that alcohol / drugs / solvents were a problem for you? Yes or No
2. Have you ever got into trouble or been arrested after drinking alcohol or taking other substances? Yes No
3. Have you consumed alcohol / drugs / solvents just prior to/or at the time of any offence you may have committed? (other than your index offence). Yes No
4. Had you been drinking alcohol or using drugs / solvents just prior to/ or at the time of your index offence? Yes No
5. Have you ever had to take alcohol / use drugs or solvents to help you with the way you feel? Yes No
6. Have you ever used deception to obtain alcohol / drugs / solvents? Yes No
7. Did you drink for the effect of alcohol without caring what kind of drink you had? Yes No
8. Did you drink as much alcohol or use as many drugs as you wanted without considering what you had to do the next day? Yes No
9. Did you find yourself unable to stop drinking alcohol or using drugs once you started? Yes No
10. Has your use of alcohol / drugs / solvents created problems between yourself and others? Yes No
11. Have you ever approached anyone for help with a drug / solvent / alcohol problem? Yes No
12. Have you ever committed offences to fund your use of alcohol / drugs / solvents? Yes No
13. What follows is a list of substances which you may have used. Please tick those which you have taken previously, (place two ticks for those you used heavily);
   Heroin ( ), Amphetamine ( ), Cannabis ( ), Ecstasy ( ), Cocaine/Crack ( ),
   LSD ( ), Magic Mushrooms ( ), Solvents/Glue ( ), Alcohol ( ),
   Temazepam / Valium/ Librium ( ).
14. Do you feel you need help with any previous misuse of substances? Yes No
15. Have you ever suffered feelings of pain / discomfort when coming off alcohol or drugs? Yes No
16. Do you ever feel a strong urge to take drugs / alcohol or solvents? Yes No
Appendix 6.

Ethical Approval
5th July 2001

Mr John Hodge
Head of Professional Practice/Head of Psychology
Rampton Hospital
Retford
Notts
DN22 0PD

Dear Mr Hodge

Re: Project: Post-traumatic stress disorder and violence: the role of information-processing biases

The above proposal was presented to the Ethics Committee meeting held on Thursday 28th June.

The Committee is pleased to approval the proposal.

May I take this opportunity of reminding you that should any changes occur to the research proposal, you should ensure that you inform the Ethics Committee accordingly.

Your research may now proceed on the understanding that a copy of the completed research be forwarded to the Committee.

Yours sincerely,

Professor P T Bean
Chairman, Rampton Hospital Ethics Committee
Appendix 7.

Descriptive Data for Violent Stroop Test
Table 34. Descriptive data for Violent Stroop Test

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
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<tbody>
<tr>
<td>Stroop</td>
<td>28</td>
<td>-9.88</td>
<td>22.10</td>
<td>2.29</td>
<td>6.71</td>
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<tr>
<td>Interference</td>
<td></td>
<td></td>
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