Profiling Trauma and the Associated Mental Health Outcomes in Prison Personnel

Russell Woodfield, BSc (Hons), MSc

A thesis submitted to the University of Huddersfield in partial fulfilment of the requirements for the degree of Doctor of Philosophy

The University of Huddersfield

June 2019

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ACKNOWLEDGEMENTS

I would like to acknowledge the help, guidance, encouragement and support from my supervisors, colleagues, family and friends who have assisted in and enabled the completion of this thesis.

I would firstly like to thank my supervisor, Professor Daniel Boduszek, for his constant guidance, professionalism, unquestionable integrity, attention to detail, suggestions, encouragement and care and concern regarding this dissertation and ultimately his friendship, as well as his full support throughout my study and research at the University of Huddersfield.

Secondly, I would like to thank my secondary supervisor Dr Dominic Willmott for assuming the role part way through my doctorate and for his friendship, suggestions, hands on help and guidance.

I would like to offer my warm thanks to the Prison Officers Association who very kindly agreed to coordinate data collection for this research amongst their members. I would also like to thank the courageous men and women of Her Majesty's Prison Service who without their honesty and openness this thesis would not have been possible, it has been an honour to serve alongside you over the years, and ultimately this thesis is for you.

Lastly, I would like to communicate my special thanks to my wonderful wife and step – daughter, my parents, and all my family and friends who have supported me throughout my long period of study, from undergraduate to PhD and conducting the research and writing up. The completion of this project was only possible thanks to the love, kindness, patience, emotional and financial support and their belief in me, at the times I have doubted myself. You will never fully understand how eternally grateful I am to all of you.

ABSTRACT

Research has found that working within a prison environment can induce both stress and exposure to trauma, furthermore research has also highlighted the need for context specific trauma exposure measures in specified populations, the overall aim of the current thesis was to address such findings through the creation of a brief self-report measure that could be used to measure exposure to traumatic incidents and would also demonstrate predictive validity for a number of psychological conditions that have been shown to be an inherent part of prison associated work. The first empirical chapter sought to validate the Prison Personnel Trauma Measure (PPTM) designed specifically to measure trauma exposure in prison personnel. Utilising a sample of prison personnel based in England and Wales (N = 1995) dimensionality and construct validity of the PPTM were investigated using confirmatory factor analysis, which revealed that a three-factor model of the PPTM (self-harm/death, violent, and environmental trauma exposure) provided the best representation of the data. Good composite reliability and differential predictive validity for several outcomes were also observed. This measure was then applied in the subsequent chapters to examine the relationship between trauma exposure and PTSD, anxiety and depression symptomology. The second empirical chapter employed a latent profile analysis to identify meaningful subtypes of anxiety, depression and PTSD symptomology amongst prison personnel and estimate the association between anxiety, depression and PTSD class membership and typology of prison trauma exposure measured by the PPTM. Seven distinct classes were identified in male personnel and five distinct classes in female personnel. Multinomial logistic regression further revealed differentiations in class memberships and associations with typology of trauma exposure. The third empirical chapter investigated the moderating role of prison personnel's years of service on the relationship between the three trauma factors of the PPTM and PTSD symptomology. Differential associations were identified between years of service, trauma and PTSD. Results showed specifically that years of service significantly moderated the effects of violent trauma exposure and PTSD. Furthermore, it was identified this moderation occurred specifically in male personnel but not in female personnel. Several implications for practice and intervention were identified and outlined, namely the potential for the PPTM to be utilised in the measurement of trauma exposure in prison personnel, by practitioners, researchers and prison organisations, as well as the identification of specific trauma variables that may cause the development of adverse psychological conditions. Further implications lie in the identification of specific variabilities between male and female personnel following specific prison trauma exposure.

LIST OF ABBREVIATIONS

AD	Adjustment Disorder
AIC	Akaike Information Criterion
ANOVA	Analysis of Variance
APA	American Psychiatric Association
ASD	Acute Stress Disorder
α	Cronbach's Alpha
B	Unstandardized Regression Weight
β	Standardized Regression Weight
BIC	Bayesian Information Criterion
BPD	Borderline Personality Disorder
BPS	British Psychological Society
CBT	Cognitive Behavioural Therapy
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CI	Confidence Interval
CM	Cognitive Model of PTSD
C-PTSD	Complex Posttraumatic Stress Disorder
C-REPS	Contextualised Representations
DESNOS	Disorder of Extreme Stress not Otherwise Specified
df	Degree of Freedom
DRT	Dual Representation Theory
DSM	Diagnostic Statistical Manual of Mental Disorders
DSO	Disturbances in Self Organisation
DSED	Disinhibited Social Engagement Disorder
EEA	Environment of Evolutionary Adaptedness
EPCACE	Enduring Personality Change after Catastrophic Experience
EPT	Emotional Processing Theory
GAD	Generalised Anxiety Disorder
HADS	Hospital Anxiety and Depression Scale
HMPPS	Her Majesty's Prison and Probation Service
ICD	International Classification of Diseases

LCA	Latent Class Analysis
LPA	Latent Profile Analysis
LRT; Lo	Lo-Mendell-Rubin adjusted likelihood ratio test
M	Mean
MDD	Major Depressive Disorder
ML	Maximum likelihood
MLR	Multinomial Logistic Regression
MR	Multiple Regression
MRA	Moderated Regression Analysis
NACM	Negative Alterations in Cognition and Mood
NOMS	National Offender Management Service
p	Probability
PCL-C	Posttraumatic Stress Disorder Checklist – Civilian Version
PDD	Persistent Depressive Disorder
POA	Prison Officers Association
PO's	Prison Officers
PPTM	Prison Personnel Trauma Measure
PTE	Potentially Traumatic Event
PTSD	Post-traumatic Stress Disorder
r	Correlation Coefficient
RAD	Reactive Attachment Disorder
RMSEA	Root-Mean-Square Error of Approximation
RMSR	Root Mean-Square Residual
SAM	Situationally Accessible Memories
S-PTSD	Subthreshold PTSD
SD	Standard Deviation
SE	Standard Error
SEM	Structural Equation Modelling
SPSS	Statistical Package for the Social Sciences
S-REPS	Sensation near Representations
SRMR	Standardized Root Mean-Square Residual
SRT	Stress Response Theory
TLI	Tucker Lewis Index

TSA	The Theory of Shattered Assumptions
TSRD	Trauma and Stressor Related Disorders
UK	The United Kingdom
US	The United States of America
VAM	Verbally Accessible Memory System
WHO	World Health Organisation
WLSMV	Weighted Least Squares Mean and Variance Adjusted Estimator
WRMR	Weighted Root Mean Square Residual
χ^2	Chi-square
η^2	Eta squared
λ_i	Standardized factor loading
θ_i	Standardised error variance

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Declarations:

Part of Chapter Three has been published in the *European Journal of Trauma and Dissociation*

Woodfield, R., Boduszek, D. & Willmott, D. (2018). Introduction and Psychometric Validation of the Prison Personnel Trauma Measure, *European Journal of Trauma and Dissociation.*

DOI: 10.1016/j.ejtd.2018.04.005 (ISSN 2468-7499).

For so runs the oracle of our inspired teacher: “When you come to a patient’s house, you should ask him what sort of pains he has, what has caused them and how many days he has been ill, so says Hippocrates in his work Affections. I may venture to add one more question: what occupation does he follow?

- Bernardino Ramazzini 1713

CHAPTER ONE:

Theoretical Introduction

1.1 INTRODUCTION AND RESEARCH AIMS

Following exposure to traumatic incidents some individuals may go on to develop psychological disorders. The type of disorder that develops is governed by several generic and individual factors. Numerous theories have been proposed to account for this development within individuals (Brewin & Holmes, 2003).

One such disorder is Posttraumatic Stress Disorder (PTSD) (American Psychiatric Association – APA, 2013). PTSD occurs as a result of "exposure to actual or threatened death, serious injury, or sexual violence by directly experiencing, witnessing the event in person occurring to others, learning the event occurred to a close family member or friend (in the case of actual or threatened death the event must have been violent or accidental) and experiencing repeated or extreme exposure to aversive details of the traumatic event" (APA, 2013, pp. 274-276). PTSD is a trauma and stressor related disorder and heterogeneous syndrome characterised by relatively disparate symptom clusters. These include intrusive thought processes of memory related to the trauma with dissociative reactions and flashbacks, with efforts of avoidance to supress or avoid the distressing memories, thoughts and feelings, negative alterations in cognition and mood symptoms also occur along with alterations in arousal and reactivity. The symptoms endure from a month onwards following exposure to trauma and may last for several months or even years and cause significant distress or impairment in social, occupational and other areas of functioning.

Prevalence rates for PTSD vary, with as much as 3.5% of the general population in the USA being recorded and 1% in European, Asian, African and Latin American countries (APA, 2013), with further higher rates generally observed in areas of conflict or natural disaster (Bisson, Cosgrove, Lewis & Robert, 2015). Individuals with PTSD are 80% more likely to present with symptoms that meet the diagnostic criteria for at least one other mental disorder (Helzer, Robins & Mcevoy, 1987; Breslau, Davis, Andreski & Peterson, 1991; APA, 2013). The effects of traumatisation leading to the development of PTSD show that it rarely occurs in isolation in trauma exposed individuals (Kozari´c-Kovaci´c, Hercigonja, & Grubisi´c-Ili´c, 2001; Orsillo, Raja & Hammond, 2002). Depression, anxiety and substance use consistently emerge as being the most commonly featured comorbid conditions with PTSD (Brady, Brewerton & Lucerini, 2000). Wide disparate rates have been observed with comorbid prevalence of PTSD with depression ranging from, 21-94% with comorbid anxiety 39-97% and 11-67% endorsing triple comorbidity (Ginzburg, Ein-Dor, & Solomon, 2010). Such

findings have been accounted for by several mechanisms, depression and anxiety may increase the risk of developing PTSD; or PTSD may be a causal risk factor to the development of anxiety and depression; or the observed comorbidity may be attributed to symptom overlap, or PTSD, anxiety and depression may share several commonalities of risk factors but remain independent disorders (Breslau, 2002; O'Donnell, Creamer, &Pattison, 2004).

The highest rates of PTSD are found among those individuals exposed to rape, war, military combat and captivity, ethnically or politically motivated genocide and internment, between 30-50% of these such individuals will develop PTSD. Higher rates are recorded in females in comparison to males (Kessler, McGonagle, Zhao, Nelson, Hughes, Eshleman, Witchen, & Kendler, 1994) with females twice as likely to develop the disorder as males. Females experience PTSD for longer durations than males. Increased risk for females may stem from an increased likelihood of exposure to traumatic events, particularly rape and interpersonal violence (Kessler et al., 1994).

PTSD has also been found to be prevalent amongst cohorts outside of the general findings, specifically within professional occupations whose roles entail a higher risk of trauma exposure from that of the general population such as, police officers (Perrin et al., 2007), firefighters (Corneil, Beaton, Murphy, Johnson, & Pike, 1999), paramedics and first responders (Jones, Nagel, McSweeney, & Curran, 2018) and military personnel (Fulton et al., 2015). Prevalence rates of 11% for PTSD, 15% for depression, 15% for anxiety have been found in paramedics and first responders (Petrie et al., 2018). Rates of 15.2% have been found in military personnel post-conflict (NVVRS; Kulka et al., 1990) PTSD rates for personnel injured during combat have been found to be much higher, 31.8% in comparison to uninjured personnel 13.6% (Hoge et al., 2007). Prevalence rates for PTSD amongst firefighters has been found to range from 17% to 22% (Vieweg et al., 2006; Wagner et al., 1998). Amongst police officers' findings indicate a prevalence rate of PTSD between 4.5 and 9% (Berger et al., 2012; Maia et al., 2007).

Of interest within the current thesis is the professional occupation of Prison Officers (individuals granted official authority within the specific domain of a prison environment and charged with the care and detainment of individuals held more often than not against their will in forfeit of their freedom as decreed to be so by a court of law). Denhof and Spinaris (2016) review of US corrections literature found that prison staff and particularly prison officers are often exposed, directly and indirectly, to incidents involving violence, injury and sometimes death (Konda, Tiesman, Reichard, & Hartley, 2013; Schlosser, Safran, & Sbarratta, 2010;

Spinaris, Denhof & Kellaway, 2012; as cited in Denhof & Spinaris, 2016) reported examples included being physically assaulted, witnessing attempted or completed suicides, being threatened with physical harm, witnessing assaults, riots, arson, or learning disturbing details about an offender's crimes on a recurrent basis over their careers. It was also found that prison officers have not received the extent of research attention as similarly comparable occupational roles, even though they may be exposed to many of the same types or similarities of work-related traumatic events as police officers, firefighters, and military personnel (Perrin et al., 2007; Corneil,et al., 1999; Fulton et al., 2015; Gates et al., 2012; as cited in Denhof & Spinaris, 2016), as well as being exposed to the similar occupational requirements of first responders also (Jones et al., 2018). Denhof and Spinaris (2016) own studies have found prevalence rates for PTSD as high as 27% amongst United States (US) correctional officers (Spinaris et al., 2012) with a comorbidity prevalence of PTSD and Depression of 24.9% (Denhof & Spinaris, 2016).

A number of self-report measures have been developed over the past twenty-five years to assess exposure to potentially traumatic experiences, high magnitude stressors, trauma related incidents and traumatic life events. These measures are generically referred to as trauma exposure measures, but most do not assess whether events are associated with significant or lasting psychological distress and as such further assessment measures and/or clinical diagnoses are often used to assess lasting psychological harm. Trauma exposure measures primarily seek to assess criterion A (exposure to a traumatic event) eligibility for diagnosis of PTSD as defined by the Diagnostic and Statistical Manual of Mental Disorders (DSM) (APA, 2000, 2013). The development of context specific measures of trauma exposure that can be utilised amongst specified cohorts is limited (Weiss, Brunet, Best, Metzler, Liberman, Pole & Marmar, 2010; King, King, Vogt, Knight. & Samper, 2006). The advantages in developing such context specific measures are apparent in the specific situational, cultural, organisational and occupational populations that they target to assess. Isolating context specific trauma exposure from general life history trauma events can help establish the essential differentiation between the two situational exposures and help ascertain magnitudes and frequencies within specified populations and individuals thus enabling more detailed post trauma treatment diagnosis and strategies. Such measures may also enable clinicians, researchers and others with vested interests to better ascertain where and which exposures to potentially traumatic events may be problematic within the working environment for example, of collective or individual

employees, and how repeated exposure to specific traumas may lead to adverse psychological outcomes, chronic maladaptation and other negative health related outcomes.

The need for context specific measures of trauma exposure and PTSD in specified populations has been highlighted (Stover & Berkowitz, 2005; O'Hare, Shen & Sherrer, 2013). Context specific measures in the literature that have been used to ascertain trauma exposure in prison personnel specifically are limited, as are attempts to provide cohesion in using generalised trauma measures. Considering the suggestions that generalised measures of trauma exposure do not effectively encapsulate unique cohorts with potentially different sub symptomology (Stover & Berkowitz, 2005; O'Hare et al., 2013), and considering the findings that prison officers work, where exposure to hostility, isolation, violence, injury, and death is a matter of routine, and thus the potential for development of PTSD and comorbid illness maybe significant, a number of research aims were identified.

The primary aim of the current study, was to create, develop and validate in a sample of prison personnel a brief self-report measure of trauma exposure specific to such personnel employed within a prison environment and to psychometrically test the measure to ascertain the most suitable factorial solution which would identify varying typology groupings of trauma association. A further aim was to test the measure for predictive validity in several adverse psychological conditions, namely PTSD, depression, and anxiety and in varying categories of prison establishments and male and female prison personnel. Further aims were to employ the validated measure to identify meaningful subtypes of anxiety, depression and PTSD symptomology amongst the prison personnel sample and to estimate the associations between anxiety, depression and PTSD class membership and typology of prison trauma exposure. Lastly the validated measure would also be employed to investigate the ability of the samples years of service working within a prison environment to moderate the relationship between typologies of prison trauma exposure and PTSD symptomology.

1.2 PTSD AND TRAUMA EXPOSURE - HISTORICAL CONTEXT

Evolutionary perspectives have proposed that a risk of trauma has been part of the human condition since we first evolved as a species (Goldstein, 2007). Early species of hominids were particularly susceptible to an array of potentially traumatic events long before evolvement into our current sub – species, homo – sapiens. Attacks by animals because of natural predation and order are frequently cited causes, other situations include natural disasters, conflict and hunting activities.

Human beings have been shown to employ six proposed defensive mechanisms; avoidance, attentive immobility, withdrawal, aggressive defence, appeasement, and tonic immobility in situations of potential threat as a consequence of our evolutionary past (Cantor, 2005). The outcome of the instinctual defensive strategy or subsequent cognitive appraisal that is employed by an individual in response to a direct potential threat, and dependent on the type and magnitude of the threat, will govern whether that threat has the potential to be deemed as psychologically traumatic to the individual subjected to it.

As a result of exposure to potential threats, some individuals will go on to develop psychological trauma whereas others may not, and this trauma may manifest as a particular type of disorder. The type of disorder that develops is governed by a number of generic and individual factors. As previously stated, several theories have been proposed to account for this development within individuals (Brewin & Holmes, 2003) with PTSD (APA, 2013) being one such disorder following exposure to trauma.

From an evolutionary perspective the physiological and biological reactions to threat may have remained relatively unchanged, and the typology of trauma that defines PTSD has remained relatively general to the human experience, however within the context of modernity, how human beings perceive potential threat and exposure to trauma has developed, individuals are now exposed to routine trauma not only in the evolutionary sense but in a greater conspecific sense than ever before in our histories as a result of expanding human populations. Whereas once humans lived in small hunter-gatherer communities where exposure to threat was limited to threats of predation, physical injury, and conspecific trauma through conflict and natural disasters (and although modern humans may continue to be exposed to these ‘traditional’ threats) it is arguable with the development and expansion of human societies and the control they impose, threats of predation have diminished, limited to a few isolated

communities in the world. Expectation, awareness and preparation for natural disasters has also been greatly enhanced to ensure survivability. Prevention of diseases and illnesses and better treatments have also ensued. However, as societies have expanded so have the threats from conspecifics greatly increased, conflict has escalated to proportions of industrial international scale using ever more sophisticated and destructive weaponry, with imprisonment a consequence of warfare and conflict, people are at greater risk of being victims of traumatic crime, violent assault, homicide and domestic abuse, environmental threats from living in modern human societies have also increased, car accidents, rail, shipping and aircraft disasters and attacks on non-combatants from ideological movements through the use of terrorism are all such further examples.

Of relevance to the current thesis is the exposure to potential threat and trauma through the occupational role requirements of modern societies, roles such as military personnel, paramedics, first responders, medical personnel, firefighters and police officers as well as other specialised occupations.

1.2.1 History of the PTSD Diagnosis

Prior to its first inclusion in 1980 into the DSM-III (APA, 1980) formulating a recognised diagnosis for the condition, PTSD was described and diagnosed under a variety of different names by both the medical literature, DSM-I (APA, 1952) and the World Health Organisation (WHO) International Classification of Diseases (ICD), (ICD-6, WHO, 1948).

Evidence of PTSD in its historical context was described in the ancient texts, the lliad of Homer and the Odyssey, both describe soldiers traumatized by war. Shakespeare's, King Henry IV set in 1598, tells of the character Hotspur suffering from post – traumatic nightmares (Weisaeth, 2014). Much of the condition's early recognition and oddity of behaviour manifests from serving and post serving soldiers during and after combat. Its first conceptualised model was formulated in 1761 by Austrian physician Josef Leopold who called it 'nostalgia' in soldiers (Wilson, 1994). The Crimean War (1853-1856) reported soldiers were often incapacitated with 'irritable heart' with no physiological heart symptoms. The English surgeon Frederick Erichsen (1860) referred to an illness described as 'railroad spinal syndrome' for people traumatised by accidents on railways, which provided the first recognition that a traumatic event could produce psychological as well as physical injury. During the US civil war (1861-1865), the term 'irritable heart' was also used to describe PTSD like symptoms in soldiers, thus providing a linkage between symptomatic conceptualisations between countries

and conflicts that were unrelated of experience. Charles Dickens (1865) himself chronicled 'railway shaking' with associated phobia of train travel following involvement in a railway accident and the witnessing of loss of life (Trimble, 1985). 'Soldiers heart' was described by Charles Samuel Myers in 1870. In 1871 Da Costa a veteran army surgeon from the US civil war wrote that 'soldiers' heart' involved chronic traumatic neurosis, with some experiencing paralysis or loss of sensation and formulated the condition 'Da Costa syndrome' many years after the war traumatised veterans from the Crimean War were also recognised as suffering from 'Da Costa syndrome' or 'effort syndrome'. Jean-Martin Charcot (1882) used the terms traumatic neurosis and traumatic hysteria for patients with PTSD. Hermann Oppenheim, (1885) used the term traumatic neurosis claiming there was a physical disturbance in the cerebrum to describe the symptoms of PTSD, this initiated the word 'trauma' into the use of psychiatry as well as surgery (Weisaeth, 2014). Freud's seduction theory was also first formulated in 1896 to account for the damaging effects of child sexual abuse on females.

Leading into the 20th century little further development or agreement of PTSD like symptoms had been formulated across countries or medical practices. Further studies and observations of combat veterans during the Boer War (1899-1902) revealed further insights. PTSD symptoms were diagnosed as 'disorderly action of the heart' replacing 'irritability of the heart'. Dr Morgan Fincuane noted in soldiers who although physically healed had debilitation associated to psychological problems, similar to nervous shock in railway accidents and he proposed soldiers were suffering from 'railway spine', thus first linking combat trauma and civilian disaster trauma with associating symptoms (Jones & Wessely, 2005). In 1904 an official government report on the health of Boer War troops concludes 'disorderly action of the heart' is attributable to carrying heavy weights on large marches combined with the excitement and nervousness of going into battle. Around this time in the face of unpopularity Freud publicly abandoned his seduction theory linking child sexual abuse with mental illness and replaced it with the 'oedipus complex'. Freud still acknowledged the harm of child sexual abuse, but it still lacked any insightful research until the 1970's (Hartke, 2016). In 1914 the first description of PTSD like symptoms in rescue personnel occurred, who were tasked with providing support in the aftermath of explosions on French ships.

World War I provided a notable shift in the recognition of the modern diagnosis of PTSD, this was partly due to more factually evident accounts and its relative closeness in history to present times. PTSD symptoms were defined in various contexts throughout this conflict most notably with the term 'shell shock'. There was suggestion that the symptoms

were overlapped with brain damage caused by the heavy munitions that were involved (Weisaeth, 2014). Shell shock was characterised by a sudden onset of symptoms whereas 'combat exhaustion' was gradual. Shell shock was later termed a 'disorder of will' and was dealt with by disciplinary action, infamously sometimes by 'firing squads'. German Psychiatrist Bonhoeffer's study in 1926, concluded 'traumatic neurosis' was a 'social illness' in which patients demonstrated a 'personal weakness' and were motivated by compensation through health insurance (Weisaeth, 2014). World War II brought further development and understanding of the PTSD condition. As in World War I many symptoms presented comorbidity of diagnosis with terminology of 'battle neuroses, 'battle fatigue', 'combat exhaustion' and 'shell shock'. Kardiner (1941) suggested that 'traumatic neuroses' in peacetime were the same condition as wartime counterparts. An important distinction in World War I & II was a move away from conventional 'hand to hand' style combat prevalent in many wars previous to the 20th Century. Fear and anxiety are suggested to have been greater due to factors of 'mechanized terror', unpredictability and more deadly weaponry in use. However, it was counter argued this more 'clinical' aspect of warfare with death infliction carried out at a distance could lessen the impact of personal traumatic experiences (Wilson, 1994). High numbers of civilian trauma exposed causalities with indirect involvement in conflict were also prevalent to a much greater extent in World War II, the holocaust, strategic intentional bombing of civilian targets, ethnic cleansing being some of the examples of atrocities that occurred on a mass scale (Weisaeth, 2014). Work published by researchers after World War II was largely disregarded as being of a more historical interest as opposed to psychiatric.

In 1948 the World Health Organisation included acute situational maladjustment in the ICD-6 (WHO, 1948) with three types, abnormal excitability under minor stress, combat fatigue and operational fatigue to account for varying degrees of PTSD symptomology (Henderson, 2001). Gross stress reaction was included in DSM-I (APA, 1952). Described as a transient situational personality disorder with a reversible reaction that occurs in an individual with no existing personality disorder, attributed to severe physical demands and / or extreme emotional stress resulting from combat or civilian catastrophe (APA, 1952). Research in the 1950's was in opposition to the effects of childhood sexual abuse, the Kinsey Institute reported a prevalence of 25% in females, Weinberg's child sexual abuse research claimed the prevalence of nine cases in a million based on court cases only (Spiegel, 2013). Venzlaff (1958) published work on a study of Nazi concentration camp victims suggesting traumatic stress caused a 'life event-based personality change'. In 1992 the WHO added 'enduring personality change after

catastrophic experiences' to ICD-10, the disorder is now known as Complex PTSD (C-PTSD), based on the negative alterations of cognition and mood cluster of symptoms found to be prevalent in victims of prolonged and sustained abuse (WHO, 2010).

Survivor syndrome was recognised in 1961 by Niederland, with an emphasis on survivor guilt, the study of victims of the concentration camps demonstrated C-PTSD type symptoms, with an inability to experience pleasure, establish interpersonal relationships and chronic anxiety. Denial of PTSD still occurred around 1962, explanations are typified as a form of malingering behaviour, with faked symptoms to acquire compensation that subside once this has been achieved (Trimble, 1985). Dr Henry Kempe produced research in 1962 'the battered child syndrome' highlighting evidence for PTSD symptoms in children. In 1968 updates were made in the ICD-8 and 'transient situational disturbance' replaced 'acute situational maladjustment' including diagnoses of combat fatigue and gross stress reaction (WHO, 1968), there were no revisions to the previous ICD – 7 with context to PTSD type illnesses. 'Transient situational disturbance' was also included in DSM-II (APA, 1968) recognised by the term 'adjustment reaction of adult life'. Importantly the effects of trauma were recognised as an external causational factor as opposed to a personality related disorder, specifying improvement to the condition once the level of stress is reduced or removed. Following the Vietnam War (1974) with heightened awareness of the effects of combat exposure, public awareness was also enhanced, and further research was conducted. The start of the women's movement also raised awareness of the effects of abuse towards females. Rape trauma syndrome was highlighted by Burgess and Holmstrom (1974) with reference to flashbacks and nightmares symbolic with combat veterans.

The ICD-9 is published in 1977 with 'acute reaction to stress' with symptoms of predominant disturbance of emotions, consciousness, or psychomotor disturbance (WHO, 1977). In 1978 Charles Figley himself a Vietnam veteran and later to become an academic on the subject of trauma publishes the first edited book about PTSD in Vietnam veterans entitled 'stress disorders among Vietnam veterans' (Figley, 2012). The DSM-III in 1980 included for the first time PTSD as a separate diagnosis. Labelled in the anxiety disorders section. The trauma related incident involving its inception is categorised as 'outside of the range of usual human experience' listing both civilian and military combat trauma. No direct reference is made to domestic violence or child abuse (APA, 1980). The PTSD diagnostic criteria were revised in the DSM-III-R in 1987 with inclusion of avoidance symptoms and symptoms persisting for one month or more from diagnosis, the traumatic experience was revised to state

‘intense fear, terror or helplessness’ (APA, 1987). In 1992 C-PTSD was first proposed by Judith Herman to account for PTSD sub-symptomology in those who have suffered protracted trauma and abuse (Herman, 1997). It is also first proposed to incorporate three non-PTSD post traumatic disorders, dissociative identity disorder, borderline personality disorder and somatisation disorder. The condition was renamed to ‘Disorders of Extreme Stress not Otherwise Specified’ by the DSM-IV workgroup, who rejected it viewing it as a more severe form of PTSD. ICD-10 was published in 1992 with the inclusion of three post traumatic conditions. Acute stress reaction with symptoms persisting for a month or less post trauma and PTSD with symptoms persisting for a month or more post trauma, both are classed as anxiety disorders. Enduring Personality Change after Catastrophic Experiences which later becomes known as C-PTSD is classed as an adult personality disorder (WHO, 1992).

DSM-IV published in 1994 added ‘Acute Stress Disorder’ to encompass post – traumatic disorder with similar symptomology to PTSD but that does not persist for longer than a month (APA, 1994). C-PTSD was not included as a separate diagnosed disorder. The DSM-5 was published in 2013, PTSD and Acute Stress Disorder are moved from the Anxiety disorders to a new Trauma and Stressor – Related Disorders section (APA, 2013). A dissociative subtype of PTSD was introduced. C-PTSD was again not included as a separate diagnosed disorder. Complex PTSD was later included as a separate diagnosis in ICD-11 (WHO, 2018).

It is clear and important to note from the above timeline of events that the clinical diagnosis of PTSD in its current form has come about from a significant amount of change and amendments based upon significant practitioner expertise and research and has rarely remained static. As such the importance of the stated timeline allows for a concise explanation to the evolvement of the disorder’s diagnosis and reasoning behind it in order to contextualize it in its current format.

1.2.2 The Context of Psychological Trauma

When PTSD was first added to the anxiety disorders section of the DSM III (APA, 1980), it was controversial, but the PTSD diagnosis filled an important gap in psychiatric theory and practice. The most significant proliferation from its historical perspective was its stipulation that the causational factor was outside of the individual (a traumatic event) as opposed to inherent individual weakness (traumatic neurosis). The necessary latter

understanding of PTSD must first be derived from an understanding of the concept of 'trauma' (Trimble, 1985).

The concept of psychological trauma was first proposed by Oppenheim (1885) who used the term 'traumatic neurosis' and initiated the word 'trauma' into the use of psychiatry as well as surgery (Weisaeth, 2014). Psychological abuse described as "interactions in which one person behaves in a violent, demeaning or invasive manner towards another person" (VandenBos, 2006) is distinct from psychological trauma which is "the result of direct personal experience of an event that involves actual or threatened death or serious injury; threat to one's physical integrity, witnessing an event that involves the above experience, learning about unexpected or violent death, serious harm, or threat of death, or injury experienced by a family member or close associate" (APA, 2000, p. 424). Definitions of what constitutes a 'psychological trauma' have been wide ranging due to the prognosis that allows for the criteria of PTSD to be met, and inversely variations of trauma have been included to meet the diagnostic criteria of PTSD.

In the DSM-III (APA, 1980) formulation for PTSD diagnostic traumatic events were conceptualised as catastrophic stressors outside the range of normal human experience. Distinctions were made between those events that constitute the painful stressors of life i.e. divorce, serious illness, financial difficulties and those that constituted traumatic events such as war, torture, rape, natural disasters and human made disasters. Importantly it listed both civilian and military combat trauma as causes and introduced the concepts of similarity in the exposures in the subsequent symptomology. In this concept of terminology ordinary stressors would under DSM-III have been diagnosed as adjustment disorders and would not meet the criteria for traumatic stressors. The distinction being that although most individuals would have the ability to cope with ordinary stress they would likely be overwhelmed and unable to cope with catastrophic stressors (APA, 1980; Trimble, 1985). DSM-III diagnostic criteria were revised in DSM-III-R, DSM-IV and DSM-IV-TR (APA, 1987; 1994 & 2000). Subsequent research revealed an important distinction since PTSD's first proposed diagnostic criteria (APA, 1980), firstly being its relative commonality. Suggested lifetime PTSD prevalence rates of 3.6% for men and 9.7% for women occur in the USA (Kessler, Chiu, Demler, Merikangas & Walters, 2005). In post conflict countries rates of PTSD have been found to be much higher, Algeria 37%, Cambodia 28%, Ethiopia 16% and Gaza 18% (De Jong, Komproe, Ivan, von Ommeren, Masri, Araya, Khaled, van de Put & Somasundarem, 2001). The DSM-IV incorporated a history of exposure to a traumatic event and symptoms from each of the three

clusters, B (persistent re-experiencing of the traumatic event), C (persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness) and D (persistent symptoms of increased arousal) as its diagnostic criteria (APA, 1994) a fifth criteria included duration of the symptoms and a sixth that the symptoms cause significant distress and impairment (see section 1.3, sub section 1.3.2, PTSD, for full symptom cluster definitions). DSM-5 revisions from DSM-IV made a move away from a fear-based anxiety disorder to classifying it in a new category, Trauma- and Stressor-Related Disorders, in which each disorder is preceded by exposure to a traumatic or adverse environmental event. Diagnosis expanded to include anhedonia and dysphoric symptom presentations marked by negative alterations to cognition and mood and disruptive behaviours (APA, 2013).

Psychological trauma is currently classified into two types, Type I and Type II respectively. Determining the type of the trauma and its impact may lead to subsequently determining whether an individual will develop PTSD. Type I trauma is defined as a single incident trauma, this may include a catastrophic incident on a mass scale e.g. a natural disaster or a more specific incident to the individual e.g. serious physical injury through assault. Type II trauma sometimes known as 'complex trauma' is a repetitive and chronic trauma exposure that may occur over subsequent occasions and prolonged periods of time, generally this occurs in some type of captivity which is not necessarily physical, where a person is subjected to systematic methods of coercive control by the perpetrator who assumes totalitarian control, such as domestic violence, concentration camps, cults, organised sexual exploitation and childhood abuse (Courtois & Ford, 2009).

Because of the trauma classifications, potential for the development of PTSD currently encapsulates a wide range of trauma exposures and chronic abuse scenarios. DSM-5 stipulates "the directly experienced traumatic events in Criterion A include but are not limited to, exposure to war (combatant or civilian), threatened or actual physical assault, threatened or actual sexual violence, being kidnapped, being taken hostage, terrorist attack, torture, incarceration as a prisoner of war, natural or human made disasters, and severe motor vehicle accidents" (APA, 2013, p. 274). For children prognosis encompasses developmentally inappropriate sexual experiences. Life threatening illnesses or debilitating medical conditions are not considered traumatic events, however DSM-5 stipulates "medical incidents that qualify are those that involve sudden catastrophic events, witnessed events include but are not limited to, observing threatened or serious injury, unnatural death, physical or sexual abuse of another person due to violent assault, domestic violence, accident, war or disaster, or a medical

catastrophe in one's child, indirect exposure through learning about an event is limited to experiences affecting close relatives or friends and experiences that are violent or accidental" (APA, 2013, p. 275). In contrast the ICD-10 (WHO, 1992) PTSD criteria was more limited in its definition and conceptualises the trauma as a stressful event or situation (of either brief or long duration) of an exceptionally threatening or catastrophic nature, which is likely to cause pervasive distress in almost anyone, it also does not provide specific mention to what, where or how these events can / or may occur.

Importantly, contextualising trauma is necessary for any subsequent diagnosis to occur. Trauma and/or abuse are the only recognised causes of PTSD. It is generally accepted that the disorder as outlined in DSM-5 requires subjection to a type I trauma and that type II traumas are not considered severe enough to meet present diagnostic criteria. However, current research investigating the role of multiple type II traumatic experiences in the development of psychological symptomology is now being recognised (Debowska, Boduszek, Sherretts, Willmott, & Jones, 2018; Humphries, Debowska, Boduszek, & Mattison, 2016). The distinction between type I and type II trauma is essential, the typology of trauma shapes the clinical presentation, conceptualisation and treatment approach. PTSD diagnosis as described in DSM-5 is reflective of post traumatic responses inflicted by type I trauma. Patients that present with type II trauma exposure show wider ranging clinical manifestations that include dissociation, self-harming behaviour, addiction and paranoia. Various psychological conditions independent of PTSD can manifest because of exposure to type I traumas and repeated exposure to type II traumas such as, acute stress disorder, PTSD, adjustment disorders, reactive attachment disorder, disinhibited social engagement disorder, other specified trauma and stressor related disorders, unspecified trauma and stressor related disorders (APA, 2013; WHO, 1992).

1.3 PSYCHOPATHOLOGY – OPERATIONAL DEFINITIONS

1.3.1 Trauma and stressor related disorders

The trauma and stressor related disorders section was included in DSM-5 (APA, 2013) following revision from DSM-IV (APA, 1994). Originally the disorders stipulated within this section, such as PTSD were included within the section of anxiety disorders. However, the combining pre-requisite of the trauma and stressor related disorders are the requirement for traumatic or stressful events as a specific diagnostic criterion. Because traumatic exposure and subsequent psychological distress are transient its manifestations are also variable. In some cases, symptoms present as anxiety or fear based and as such can be more simplified. However, many trauma exposed individuals exhibit much more complex symptomology prominent with clinical characteristics of anhedonia and dysphoric symptoms, externalised anger and aggression as well as dissociation, because of this important symptomology distinction from fear based and anxiety disorders the trauma and stressor related disorders section was thus created (APA, 2013). In most individuals who are traumatically exposed it is not uncommon for them to present with a combination of the above symptoms coupled with or without anxiety and fear-based symptoms (Hall & Geher, 2003), and this has long been an established finding within the adjustment disorders. The trauma and stressor related disorders section therefore became distinct and incorporates Reactive Attachment Disorder (RAD), Disinhibited Social Engagement Disorder (DSED), Adjustment Disorder (AD), Other Specified and Unspecified Trauma and Stressor Related Disorders, Acute Stress Disorder (ASD) and Post Traumatic Stress Disorder (PTSD).

1.3.2 Post-traumatic Stress Disorder - PTSD

Posttraumatic stress disorder (PTSD) is a trauma and stressor related disorder and heterogeneous syndrome characterised by relatively disparate symptom clusters. PTSD is categorised in the ICD-10 (WHO, 1992) under the neurotic, stress-related and somatoform disorders, reaction to severe stress and adjustment disorders sub section. Within DSM-IV (APA, 1994) PTSD was originally categorised under the anxiety disorders section, before its inclusion in the TSRD section in DSM-5 (APA, 2013). A number of important revisions were also included in DSM-5 (APA, 2013), in particular how the traumatic experience was initiated and perceived, emotional reactions to the traumatic event e.g. fear, helplessness, horror are no longer part of the criterion A symptomology. Diagnostic symptom clusters were also increased

by one with the inclusion of the negative alterations in cognition and mood category (NACM). Distinctions between acute and chronic phases of PTSD were not included in DSM-5 as opposed to DSM-IV, and two new subtypes were included, preschool type and PTSD with prominent dissociative symptoms.

Within the DSM-5, "PTSD is comprised of four symptom clusters – intrusion symptoms, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity. The diagnosis of PTSD requires exposure to a traumatic event and that the four clusters of symptoms are present for at least one month, causing significant distress or impairment to the individual affected" (APA, 2013 p. 274). PTSD develops after exposure to a traumatic event in which an individual has experienced or witnessed actual or threatened loss of life or serious injury. Like the other trauma and stressor related disorders, "rather than the experience of trauma it is the person's reaction to the trauma that is critical in the development of PTSD" (APA, 2013, p. 274), according to Conway and Holmes (2010) for the subsequent development of PTSD the catalyst traumatic event must be experienced as majorly stressful. Grey, Holmes and Brewin (2001) have also found that other emotions are experienced, including anger and shame. PTSD symptoms present as 'intrusions' with the re-experiencing of the traumatic incident through dreams, thoughts or flashbacks. Avoidance symptoms develop as individuals learn what may trigger the traumatic memory intrusions and seek to avoid the cues that cause them. Hyper – arousal develops as the individual affected may experience constant alertness and impaired concentration.

The diagnostic features of PTSD are exposure to actual or threatened death, serious injury, or sexual violence in one or more of the following ways, directly experiencing, witnessing the event in person occurring to others, learning the event occurred to a close family member or friend (in the cases of actual or threatened death it is stipulated the event must have been violent or accidental) and experiencing repeated or extreme exposure to aversive details of the traumatic event. An important stipulation within the criterion A category is that traumatic exposure is not applied through the use of electronic media, television or pictures unless the exposure is work related, examples of Police Officers investigating child abuse are given (APA, 2013).

The following cluster symptoms are associated with the traumatic event and develop after exposure, Criterion B category (intrusion symptoms) requires the presence of one or more of the following, recurrent, involuntary and intrusive distressing memories of the event, recurrent distressing dreams in relation to the event, dissociative reactions or 'flashbacks' in

which a feeling of the event happening again is experienced, intense or prolonged psychological distress and marked physiological reactions at exposure to internal or external cues that resemble or symbolise the event. Criterion C category (avoidance symptoms) again requires the presence of one or more of the following, avoidance of or efforts to avoid distressing memories, thoughts or feelings about the event or close associations, avoidance of or efforts to avoid external reminders that arouse the distressing memories, thoughts or feelings about the event or close associations. Criterion D category (negative alterations in cognition and mood symptoms) requires the presence of two or more of the following, inability to recall important aspects of the traumatic event, persistent and exaggerated negative beliefs or expectations about themselves, others or the world, persistent distorted cognitions surrounding the cause and consequences of the event that may lead an individual to blame themselves or others. Persistent negative emotional state, diminished interest or participation in significant activities, feelings of detachment and estrangement to others, persistent inability to experience positive emotions. Criterion E category (alterations in arousal and reactivity symptoms) again requires the presence of two or more of the following, irritable behaviour and anger outbursts expressed as verbal and / or physical aggression toward people and objects, reckless or self-destructive behaviour, hypervigilance, exaggerated startle response, problems concentrating, sleep disturbance. The duration of the symptoms must have persisted for more than a month following traumatic exposure and cause significant distress or impairment in social, occupational or other areas of functioning and the disturbance is not attributable to physiological effects of substances or other medical conditions (APA, 2013).

Between and within individuals the clinical presentation of PTSD varies. In some individual's characteristics may manifest through fear-based re-experiencing with emotional and behavioral symptoms predominating. Anhedonia, dysphoria and negative mood states may be seen in some, whilst in others arousal and reactive externalizing symptoms are prominent, dissociative symptoms may also predominate in certain individuals particularly those who have been chronically trauma exposed (Zoladz, 2013) many more will exhibit a combination of all these symptom factors.

Prevalence rates for PTSD vary, figures of 3.5% have been found in the general population in the US, with rates of 0.5-1.0% in European, Asian, African and Latin American countries (APA, 2013). Higher rates are present in areas of armed conflict with combatants and civilians both affected (Bisson et al., 2015) and in occupations whose roles entail a higher risk of trauma exposure, police officers (Perrin et al., 2007), firefighters (Corneil et al., 1999), and

military personnel (Fulton et al., 2015). The highest rates are found among those individuals exposed to rape, military combat and captivity, ethnically or politically motivated genocide and internment, between 30-50% of these such individuals will develop PTSD. Higher rates are recorded in females in comparison to males (Kessler et al., 1994) with females twice as likely to develop the disorder as males. Females experience PTSD for longer durations than males. Increased risk for females may stem from increased likelihood of exposure to traumatic events, particularly rape and interpersonal violence. Within older adults there is evidence that the prevalence of full threshold PTSD is lower than the general population and that sub threshold PTSD symptomology is more common than full PTSD later in life and that the symptoms are associated with severe clinical impairment (Helzer, Robins, & McEvoy, 1987; Stein, Walker, Hazen, & Forde, 1997; McLaughlin, Koenen, Friedman, Ruscio, Karam, Shahly et al., 2015).

Particular symptom subsets of PTSD may vary over time as well as their predominance, duration of symptoms may also vary, complete recovery occurs within 50% of adult individuals within 3 months, amongst the remaining 50% some individuals may present with symptomology anywhere from 12 months to 50 years after initial trauma exposure. In such individual's further reoccurrence may occur because of reminders of the original trauma, life stressors, or the experiencing of new traumatic events.

Risk factors for PTSD include pre-traumatic, peritraumatic and post-traumatic. Pre-traumatic factors include, childhood emotional problems before the age of 6, and prior mental disorders. Heightened risk is associated with lower socioeconomic status, lower educational attainment, prior trauma, childhood adversity, cultural characteristics, lower intelligence, minority racial / ethnic status and family psychiatric history (APA, 2013). Genetic and physiological factors include, female as opposed to male gender and younger age at time of trauma. Peritraumatic factors include, trauma intensity, perceived threat to life, acquisition of personal injury, whether interpersonal violence has occurred (particularly in children from a caregiver), for military personal risk enhancement occurs for those who have been a perpetrator, witnessed atrocities or killed the enemy and from dissociation that occurs during and after the trauma. Posttraumatic risk factors include, negative appraisals, inappropriate coping strategies (e.g. substance abuse), initial development of acute stress disorder, subsequent exposure to reminders about the traumatic event, adverse life events or other trauma related losses, and a lack of social support (APA, 2013).

Individuals with PTSD are also 80% more likely to present with symptoms that meet diagnostic criteria for at least one other mental disorder, particularly depression and anxiety, males are also more likely than females to present with comorbid substance use disorders and conduct disorder. (Brady et al., 2000; Brady, Brewerton & Lucerini, 2000).

1.3.3 Acute Stress Disorder

Acute Stress Disorder (ASD) is characterised by a traumatic exposure response, acute stress reaction is the precedent to delayed stress reaction or PTSD. ASD displays the same symptomology characteristics of PTSD and is distinguished from PTSD by the longevity of the symptoms, if the symptoms persist longer than a month the disorder is then classified as PTSD (Bryant & Harvey, 2000).

Prevalence rates for ASD are around 20% for exposure to traumatic events that do not include interpersonal injury, higher rates of 20-50% are recorded for interpersonal traumatic events. Approximately 50% of individuals who develop PTSD will initially present with ASD (Creamer, o'Donnell & Pattison, 2004). ASD is attributed to stronger initial dissociative states than PTSD, during which an individual may experience difficulties in concentration, experiencing of the world in a dreamlike or unreal state, feelings of detachment of body and difficulty in the recall of the traumatic event. As such they experience a decrease in emotional responsiveness coupled with anhedonia symptoms.

ASD diagnosis requires a criterion A exposure and a presence of nine or more symptoms from any of the five designated PTSD symptom categories. The duration of the symptoms must last from three days to one month and cause significant distress or impairment and the disturbance must not be attributable to physiological effects of substances or other medical conditions (APA, 2013). Shevlin, Hyland & Elklit (2014) findings show statistically significant direct relationships between high levels of ASD and later development of PTSD in female victims of sexual trauma, supporting the findings of Creamer, o'Donnell & Pattison (2004) that show 50% of individuals who develop PTSD will initially present with ASD indicating symptom severity and amount may intensify over time in certain individuals.

1.3.4 Complex PTSD

Complex Posttraumatic Stress Disorder (C-PTSD) is thought to occur because of repetitive, prolonged and chronic trauma exposure that involves sustained abuse or abandonment by means of an interpersonal relationship with an uneven power dynamic (ICD-11; WHO, 2018). Trauma inflicted in the form of sexual, emotional, physical abuse and neglect

in childhood, sustained chronic intimate partner violence, victims of kidnapping and hostage situations, slavery and prisoners of war are some of the examples of trauma exposure that may induce feelings of terror, worthlessness, helplessness and deformation of an individual's identity and sense of self.

The concept of C-PTSD was first suggested in 1992 (Herman, 1992). Researchers have argued that C-PTSD is a sibling disorder of PTSD with similarity in aspects of its symptomology but distinct in its presentation (Brewin et al., 2017). There is a growing body of research into C-PTSD within the literature (Hyland et al., 2017, 2018) but as of yet there has been no inclusion within the DSM (APA, 2013). However, a disorder referred to as enduring personality change after catastrophic experience (EPCACE) is listed in ICD-10 (WHO, 1992) and PTSD with prominent dissociative symptoms in DSM-5 (APA, 2013) to account for the strong characteristic dissociative and NACM symptoms that are postulated to be present within C-PTSD.

C-PTSD incorporates similar characteristics to these disorder definitions but occurs in response to symptomology present in individuals who are chronically trauma exposed to less catastrophic but more sustained incidents. It has now been included in the ICD-11 (WHO, 2018) within the mental, behavioural or neurodevelopmental disorders, sub section of, disorders specifically associated with stress, alongside PTSD. ICD-11 defines C-PTSD as "a disorder that may develop following exposure to an event or series of events of an extremely threatening or horrific nature, most commonly prolonged or repetitive events from which escape is difficult or impossible (e.g., torture, slavery, genocide campaigns, prolonged domestic violence, repeated childhood sexual or physical abuse). The disorder is characterized by the core symptoms of PTSD; that is, all diagnostic requirements for PTSD have been met at some point during the disorder. In addition, C-PTSD is characterized by 1) severe and pervasive problems in affect regulation; 2) persistent beliefs about oneself as diminished, defeated or worthless, accompanied by deep and pervasive feelings of shame, guilt or failure related to the traumatic event; and 3) persistent difficulties in sustaining relationships and in feeling close to others. The disturbance causes significant impairment in personal, family, social, educational, occupational or other important areas of functioning" (ICD-11; WHO, 2018).

C-PTSD primarily occurs as a result of chronic trauma exposure, type II trauma is distinguished by trauma that occurs on multiple occasions and over a longer period. Individuals exposed to type II traumas may anticipate what is going to happen but be unable to do anything

about it. Many type II traumas may involve people known to the individual, particularly more commonly family members (Courtois & Ford, 2009). Type II 'complex trauma' is often defined as long term interpersonal abuse occurring on multiple occasions and often beginning early in life (Herman, 1997).

ICD-11 C-PTSD diagnosis comprises six symptom clusters, three are shared with PTSD (re-experiencing, avoidance and sense of threat) and three additional symptom clusters related to disturbances in self-organisation (DSO), specifically; affect dysregulation, negative self-concept and difficulties in relationships. Whereas previously listed, EPCACE (WHO, 1992) requires a notable change in personality C-PTSD does not and the problems associated with it which reflect DSO characteristics are sustained and pervasive and occur in a variety of contexts. Within DSM-IV (APA, 2000) 'Disorders of Extreme Stress not Otherwise Specified' (DESNOS) was previously suggested to incorporate responses to chronic or repeated trauma, its diagnosis has previously been tested (Pelcovitz, van der Kolk, Roth, Mandel, Kaplan, & Resick, 1997) utilising 48 symptoms and 6 scales and 27 sub scales. ICD-11 C-PTSD is based on a similar conceptual framework as DESNOS and is in part derived from its empirical testing (Roth, Newman, Pelcovitz, van der Kolk, & Mandel, 1997). The C-PTSD diagnosis incorporates 12 symptoms in line with emphasis on clinical utility, which includes limiting symptom amounts to formulate diagnosis.

It has been debated as to whether C-PTSD is PTSD with comorbid Borderline Personality Disorder (BPD). However, the proposed diagnostic requirements for C-PTSD are differentiated from BPD, firstly a specific trauma history is a mandatory requirement of C-PTSD whereas BPD can be diagnosed without it, secondly BPD is characterised by instability in sense of self which alternates between highly positive and negative self-evaluation and emotionally intense and unstable relationships, fluctuating with idealised perceptions and extreme criticism of others. In contrast C-PTSD is defined by a stable sense of self albeit negative with perceptions of relationships as painful, problematic with evidence of deliberate avoidance (Brewin et al., 2017).

Prevalence rates for C-PTSD suggest 0.6% in the general population and 13% in combat veterans, one quarter to one half of individuals who present with PTSD meet criteria for C-PTSD (Wolf et al., 2015). Individuals who have suffered trauma before the age of fourteen are more likely to develop C-PTSD as opposed to PTSD, particularly if the trauma has been inflicted by a caregiver (Roth et al., 1997), clinical populations are also significantly more likely to present with C-PTSD as opposed to non-clinical populations (Brom, Kleber &

Witztum, 1992). Ford, Fournier & Moffitt, (2001) presented data examining the experience of multiple traumas that patients with severe and persistent illness experienced over their lifetime, results showed that there was a 100% lifetime prevalence of at least 3 of 12 possible types of psychological trauma. There was also a 40% current and 75% lifetime prevalence of PTSD and complex PTSD as well as substantial axis I and axis II comorbidity. C-PTSD was the disorder most associated with psychiatric illness, substance abuse severity, and healthcare utilisation (Rosenberg et al., 2000; Hidalgo & Davidson, 2000).

1.3.5 Subthreshold PTSD

Trauma exposed individuals may display similar symptoms to PTSD that are more enduring than ASD but do not display the full cohort of symptoms to meet criteria for PTSD diagnosis. Such individuals have found to be borderline cases and are described as developing subthreshold PTSD (S-PTSD), (Helzer, Robins, & McEvoy, 1987; Stein, Walker, Hazen, & Forde, 1997; McLaughlin, Koenen, Friedman, Ruscio, Karam, Shahly et al., 2015). However, S-PTSD is relevant as it is also associated with significant and enduring symptomology (Marshall, Olfson, Hellman, Blanco, Guardino & Struening, 2001; Cukor, Wyka, Jayasinghe, & Difede, 2010).

Symptomology in individuals that fails to meet the full criteria specification for diagnosis has also been termed ‘partial’ PTSD within the literature. The National Vietnam Veterans Readjustment Study (NVVRS; Kulka et al., 1988; Weiss et al., 1992) was the first research to report on the prevalence of S-PTSD, in order to account for trauma exposed individuals who were not categorised as ‘non-cases’ or ‘full-cases’. Further research into diagnostic criteria emerged to formulate diagnoses for S-PTSD. All diagnostic definitions have been based on criteria established since DSM-IV (APA, 2000) requiring exposure, duration, distress or impairment criteria, with some combination of symptoms; B (re-experiencing), C (avoidance/numbing), and D (hyperarousal).

Common diagnostic strategies have required that an individual have at least one B, one C, and one D criterion symptom (Breslau, Lucia, and Davis, 2004; Pietrzak, Goldstein, Southwick, and Grant, 2011a; Stein, Walker, Hazen, and Forde, 1997). Other strategies allow multiple ways of meeting partial criteria requiring that either B and C criteria or B and D criteria be fully met (Blanchard et al., 1994) Schnurr, Friedman, and Rosenberg (1993) at least one B, one C, and one D symptom; or B and D criteria, or B, C, and D criteria, but with allowance for symptoms to be present at subthreshold levels. The DSM-5 does not specify formal diagnostic

criteria for S-PTSD but indicates that it can be diagnosed as an "Other Specified Trauma-and Stressor-Related Disorder" (DSM-5; APA, 2013).

Prevalence of S-PTSD may be higher than full PTSD, within a subsample of participants in the National Comorbidity Survey-Replication, the prevalence of lifetime PTSD was 9.7% and lifetime S-PTSD ranged from 9.8% to 11.6% depending on which of the five diagnostic rules were used (Mitchell et al., 2012). Prevalence for full PTSD and S- PTSD has been found to be higher in women than in men: 2.7% / 3.4% versus 1.2% / 0.3% (Stein et al., 1997). S-PTSD has been shown to hold clinical relevance (e.g., Breslau et al., 2004; Pietrzak, Goldstein, Southwick, and Grant, 2011b, 2011c; Pietrzak et al., 2012; Schnurr et al., 2000; Stein et al., 1997) and is associated with increased burden and decreased quality of life and is also associated with psychiatric and medical comorbidity (e.g., Fetzner, McMillan, and Asmundson, 2012; Pietrzak et al., 2011b, 2011c, 2012; Schnurr et al., 2000; von Känel et al., 2010; Yurgil et al., 2014).

1.3.6 Depression

Depression is a general state of low mood and aversion to activity that can affect a person's thoughts, behaviours, tendencies, feelings and sense of wellbeing. Depressive disorders are categorised in the ICD-10 (WHO, 1992) as mood (affective) disorders and incorporate the manic and bipolar disorders.

DSM-5 (APA, 2013) incorporated a Bipolar and Related Disorders section in its revision from DSM-IV (APA, 1994). The depressive disorders section therefore became distinct and incorporated disruptive mood dysregulation disorder, major depressive disorder, persistent depressive disorder (dysthymia), premenstrual dysphoric disorder, substance / medication induced depressive disorder, depressive disorder due to another medical condition, as well as other specified depressive disorder and unspecified depressive disorder. "The common feature of the depressive disorders is the presence of sad, empty or irritable mood, which is accompanied by somatic and cognitive changes that significantly affect an individual's capacity to function, it is the features of duration, timing and aetiology that differentiate them" (APA, 2013, p. 155). Major depressive disorder represents the classic condition within the group of disorders.

Major depressive disorder (MDD) is a common depressive disorder, in the US its prevalence rate is 7% of the population, with similar rates of between 5 -10% being found in the UK (Office for National Statistics, 2018), three times the number of 18-29-year olds present

with the disorder than individuals above 60 years of age. Females experience one and a half to three times the rates of males (APA, 2013). The diagnostic feature of MDD is that it must be present nearly every day, and the depressed mood must be present for most of the day. It is characterised by depressed mood or loss of interest or pleasure. A major depressive episode presents with the following symptoms during the same two-week period or longer, diminished interest and pleasure, significant weight loss or gain (5% of body weight in a month), insomnia or hypersomnia nearly every day, psychomotor agitation or retardation nearly every day, fatigue or loss of energy, feelings of worthlessness, excessive and inappropriate guilt, diminished concentration or indecisiveness, recurrent thoughts of death, suicidal ideation with or without a specific plan of suicide. The symptoms must cause clinically significant distress, impairment in social, occupational or other areas of functioning (APA, 2013).

Presence of a depressed mood can be inferred by an individual's facial expressions and demeanour. Somatic complaints can also be common as well as reported or exhibited irritability, anger outbursts and sense of frustration over minor matters. Loss of motivation and interest is commonly reported often accompanied by social withdrawal or neglect of pleasurable avocations. Decreased energy, tiredness and fatigue are also commonly reported. Individuals commonly report debilitating effects with even the smallest tasks that require substantial effort as well as decreased efficiency in the completion of such tasks. Impaired ability to think, concentrate or make even minor decisions is also evident (Hewitt, Flett & Mosher, 1992). MDD carries a greatly increased risk of suicidal ideation and suicide attempts. Alongside thoughts of death, thoughts of a wish not to awaken after sleep or beliefs that other people would be better off if the individual were dead are also commonly reported (Berman, 2009).

Persistent depressive disorder (PDD) also referred to as dysthymia, occurs when a major depressive episode manifests over a longer period of time. Diagnostic requirements state that the depressed mood should be present for most of the day, for more days than not, for at least two years. Symptomology presents as poor appetite or overeating, insomnia or hypersomnia, low energy or fatigue, low self-esteem, poor concentration or difficulty making decisions, feelings of hopelessness. Many individuals display chronic and persistent irritability alongside the depressed mood. Because the symptoms are characteristically chronic, they can become part of an individual's day to day experience and become maladaptive without cognitive recognition (Sansone & Sansone, 2009). In contrast to MDD when the symptoms rise to a level of a major depressive episode, they generally present at a much lower level, however they

are much less likely to resolve in a given time period (APA, 2013). Individuals with PDD are at higher risk also for general psychiatric comorbidity, anxiety disorders and substance use disorders in particular. Early onset is strongly associated with development of personality disorders, particularly BPD (APA, 2013). The disorder is fairly common in the US general population 3–6% as well as in primary care 7% and mental health settings (up to one-third of psychiatric outpatients) (Sansone & Sansone, 2009).

1.3.7 Anxiety

Anxiety is a general state of emotion whereby an individual characteristically feels an exaggerated state of nervousness, agitation and rumination, it is often accompanied by somatic complaints, restlessness, fatigue and problems with concentrating. Anxiety in the form of 'feeling anxious' can be appropriate in certain situations but can become problematic when over experienced regularly. Anxiety is distinguished from fear which occurs as an emotional response to a real or perceived imminent threat, whereas anxiety is the anticipation of a future threat. Although similar, fear is associated with autonomic arousal for the 'fight or flight' response, anxiety is associated with enhanced vigilance for future threat with cautious or avoidant behaviours.

Anxiety disorders are categorised in the ICD-10 (WHO, 1992) as neurotic, stress-related and somatoform disorders. DSM-5 (APA, 2013) categorises the disorders within the Anxiety disorders section. The Anxiety disorders are differentiated by the typology of objects or situations that may induce fear, anxiety or avoidance behaviours and the associated cognitive ideation (APA, 2013). Therefore, although the disorders share comorbid symptomology they can be differentiated by the types of situations and the associated thoughts and beliefs that accompany the fear or avoidance. The DSM-5 Anxiety disorders section incorporates, separation anxiety disorder, selective mutism, specific phobia, social anxiety disorder, panic disorder, panic attack specifier, agoraphobia, generalised anxiety disorder, substance-medication induced anxiety disorder, anxiety disorder due to another medical condition, other specified and unspecified anxiety disorder.

Prevalence rates in people for anxiety disorders stand at 12% in any given year, with between 5-30% affected by one or more of the disorders within a lifetime period. Anxiety disorders occur twice as often in females than males. The most common disorder is specific phobias with a prevalence of 12% and social anxiety disorder affecting 10%. The ages of

between, 15-35 are the most commonly reported age categories for occurrence of an anxiety disorder (Kessler, Angermeyer, Anthony, de Graaf, Demyttenaere, Gasquet et al., 2007).

With reference to generalised anxiety disorder (GAD), DSM-5 diagnostic criteria stipulate "excessive anxiety and worry which occurs more days often than not for at least six months about a number of events or activities. The individual finds it difficult to control the worry. The anxiety is associated with three or more of the following, restlessness or feeling keyed up or on edge, being easily fatigued, difficulty concentrating or mind going blank, irritability, muscle tension, sleep disturbance. The anxiety worries or physical symptoms must cause clinically significant distress, impairment in social, occupational or other areas of functioning" (APA, 2013, p. 222).

Prevalence of GAD is around 2.9% of adults in the US, prevalence rates in other countries ranges from 0.4-3.6%. Within the UK rates of 5% of the population have been found (Office for National Statistics, 2018). Females are twice as likely as males to experience GAD. Individuals who present with criteria for GAD are likely to meet or have met criteria for other anxiety disorders and unipolar depressive disorders (Gale & Millichamp, 2011). The neuroticism or emotional liability underpinning the comorbidity is associated with personality characteristics as well as genetic and environmental risk factors shared between the disorders, although it is stated independent pathways may be possible (APA, 2013). The characteristic feature of GAD is excessive anxiety and worry, which can be about several activities or events which is disproportionate to the intensity, duration and frequency of the events or activities and their actual likelihood and impact. Individuals with GAD often display worry about everyday routine life circumstances.

GAD distinguishes itself from non-pathological anxiety by its level of excessiveness and interference with psychosocial functioning. In everyday life individuals may use agency to delay issues of worry and will perceive them as manageable as opposed to an individual with GAD. Worries attributed to GAD are more pervasive, pronounced and distressing and endure for longer. The greater the range of circumstances of an individual's worries the more likely they are to present with symptomology of GAD. Furthermore, everyday worries do not usually present with the range of physical symptomology that accompany GAD. GAD symptoms can significantly impair an individual's ability to do things quickly and efficiently, in any environmental setting. Persistent worrying uses time and energy and the associated features of muscle tension, feeling on edge, tiredness, concentration difficulty and disrupted sleep exacerbate the impairment. GAD symptoms are also invariably present in PTSD; however,

GAD is not diagnosed if the anxiety and worry symptoms can be better explained by a PTSD diagnosis. GAD is also a common comorbid feature of the depressive disorders (APA, 2013).

1.3.8 PTSD and Comorbidity

PTSD is associated with high rates of psychiatric comorbidity, lifetime prevalence of psychiatric disorder comorbidity with PTSD is around 80% (Helzer et al., 1987; Breslau et al., 1991; APA, 2013). Depression, substance use and anxiety consistently emerge as the most common comorbid disorders with PTSD (Brady et al., 2000). Studies regarding the effects of military and civilian psycho-traumatisation show PTSD rarely occurs in isolation in individuals exposed to trauma (Kozari´c-Kovaci´c et al., 2001; Orsillo et al., 2002).

Comorbid rates of PTSD with depression have been found to range from, 21-94% with comorbid anxiety 39-97% and 11-67% endorsing a triple comorbidity (Ginzburg et al., 2010).

Breslau (2002) and O'Donnell et al. (2004) have attributed such wide ranging findings to the fact that firstly, depression and anxiety may increase the risk of developing PTSD; secondly PTSD may be causational in the development of anxiety and depression; thirdly the observed comorbidity may be attributed to an overlap of symptomology and fourthly, PTSD, anxiety and depression may share commonalities of risk factors but remain distinct disorders.

Ginzburg et al., (2010) longitudinal study of military veterans' found rates of triple comorbidity (PTSD, anxiety and depression; 26.7–30.1%) were higher than rates of PTSD by themselves or comorbid with depression or anxiety. PTSD predicted depression, anxiety, and comorbid disorders, but not vice versa. PTSD and depression comorbidity studies also suggest that significant depressive symptomology affects 30-50% of patients with a PTSD diagnosis (Nixon, Resick & Nishith, 2004; Blanchard, Buckley, Hickling & Taylor, 1998). Campbell et al., (2007) found a prevalence of 36% of depressed patients as meeting criteria for PTSD, and MDD comorbid with PTSD, patients reported greater overall social, health and economic problems than MDD patients.

Prevalence of PTSD comorbid with anxiety has been found in survivors of natural disasters (Dai et al., 2017) individuals presenting with PTSD, anxiety, and comorbidity of PTSD and anxiety with rates of 9.54%, 9.23%, and 6.15%,respectively. Furthermore, 64.52% of those with PTSD had anxiety and 66.67% of those with anxiety had PTSD. Nearly a fifth of the elderly survivors of the Wenchuan earthquake met the criteria for both PTSD and anxiety (Zhang, Shi, Wang et al., 2012) and in Northern Uganda, more than a third of former abductees from the civil war were identified with both PTSD and anxiety (Pfeiffer & Elbert, 2017). Of

the survivors of chemical warfare in Iran who developed PTSD, 87% were found to suffer from anxiety (Hashemian, Khoshnood, Desai et al., 2006) and the prevalence of anxiety among female Bosnian refugees with PTSD was recorded at 97.1% (Sundquist, Johansson, DeMarinis et al., 2005).

Other deleterious health effects have also been found in PTSD patients, behavioural disorders 43%, comorbid alcohol abuse or addiction to alcohol and psychoactive drugs of 35-52%. PTSD patients may also experience psychotic symptoms (Kozari´c-Kovaci´c & Borovecki, 2005; Kaˇstelan, Franciskovi´c, Moro, Roncevi´c, Grkovi´c, Jurcan et al., 2007; Soosay, Silove, Bateman-Steel, Steel, Bebbington, Jones, et al., 2012). In conjunction and aside from psychiatric comorbidity chronic PTSD patients may also present with a range of somatic health problems, cardiovascular, endocrine, gastrointestinal, respiratory, musculoskeletal, dermal and venereal diseases as well as medically explained and unexplained pain symptomology (Engel, Liu, McCarthy, Miller & Ursano, 2000; Barrett, Doebbeling, Schwartz, Voelker, Falter, Woolson, et al., 2002; Uhac, Tariba, Kovac, Simoni´c-Kocijan, Lajnert, Mesi´c,et al., 2011).

Klaric et al., (2017) found 97.4% of PTSD-diagnosed veteran's satisfied criteria for other mental disorders, 44.8% suffered chronic somatic problems, a current depressive episode (41.6%), past depressive episode (36.4%), depressive episode with melancholic features (36.4%), dysthymia (13.6%), panic disorder with agoraphobia (11.0%), generalized anxiety disorder (82.5%) alcohol abuse (34.4%) and suicidal ideation (26.0%). Comorbidity with PTSD is associated with functional impairment and disability across a variety of co-occurring disorders, including comorbid alcohol abuse (Drapkin et al., 2011) and depression (Ikin et al., 2010). PTSD has also been found to be associated with suicidal ideation and para-suicidal behaviours, however evidence suggests comorbidity with anxiety and mood disorders confers a higher risk of suicidality (Sareen et al., 2005). In serving US military personnel and combat veteran's co-occurrence of PTSD and mild traumatic brain injury rates are 48% for those who have seen active service in Iraq and Afghanistan. Amongst male's comorbid substance use disorder and conduct disorder are more common than amongst females (APA, 2013). Higher rates of comorbidity are observed amongst men 88.3% than women 79% (Kessler et al., 1995) with commonalities of comorbid alcohol dependence, drug abuse and depression for both genders. Debell et al., (2014) found alcohol misuse in those with PTSD ranged from 9.8 to 61.3 % and that alcohol misuse in those with comorbidity PTSD ranged from 2.0 to 63.0 %, most prevalence rates were over 10.0 %, this review also found most evidence for associations

between alcohol misuse to be attributed to both the avoidance/numbing symptoms and hyperarousal symptoms of PTSD.

Typology of trauma event exposure has also been shown to be significantly linked with higher numbers of comorbid disorders, such as rape and sexual assault (Leskin, 2002; Rees, 2011). Prevalence of PTSD with MDD (84.4%) has been associated with females, and all types of childhood trauma, neuroticism, low extraversion and symptom severity to be significantly correlated with the highest significant risk factors for those females who were, victims of child sexual and physical abuse (Spinhoven, Penninx, Hemert, Rooij, & Elzinga, 2014). A latent class analysis of PTSD comorbidity (Galatzer-Levy, Nickerson, Litz & Marmar, 2013) found three meaningful subtypes of lifetime comorbidity with PTSD; comorbid mood and anxiety disorders; comorbid mood, anxiety, and substance dependence; and a low-comorbidity PTSD class. Individuals in both the high comorbid classes displayed two and a half times the rates of suicidal ideation, with a greater overall PTSD symptom severity in comparison to the low comorbidity class. Men were also more likely to fall into the substance dependent class.

1.4 PTSD, THEORETICAL PERSPECTIVES AND CONCEPTS

1.4.1 Introduction

Various theories have been proposed to explain perceptions of trauma exposure and subsequent development of PTSD. As PTSD is associated with disturbances in a wide range of psychological processes including, memory, attention, cognitive-affective reactions, beliefs, coping strategies, and social support. PTSD theories seek to encapsulate these factors and account for its development as a result. The structure and content of some of the following sections are based on the paper 'psychological theories of post-traumatic stress disorder' (Brewin and Holmes, 2003) whose succinct account of the psychological processes involved and theoretical explanations of PTSD provides one of the best reviews to its development, exploratory and supportive literature.

Identifiable changes in memory functioning have been found within PTSD sufferers, with a biased tendency toward enhanced recall of the trauma related incident and difficulty in the retrieval of autobiographical memory (Buckley, Blanchard & Neill, 2000). Specific to PTSD is contradiction in recall relevant to the trauma, with high levels of emotion associated with vivid and long lasting memories in some studies (Brown & Kulik, 1977; Conway et al., 1994; Pillemer, 1998; Rubin & Kozin, 1984), and memories associated with vagueness and lack of detail in other studies (Koss, Figueredo, Bell, Tharan, & Tromp, 1996; Kuehn, 1974; Loftus & Burns, 1982). The relieving of experiences in PTSD often referred to as 'flashbacks' in relation to trauma incidents differ from normal autobiographical memory function. PTSD intrusions are associated with sensory detail, vivid mental imagery, sounds and sensations, with a key characteristic being their fragmentation and distortion of time with a sensation of 'reliving' or occurring in the present as opposed to the past. Attentional bias has been found within PTSD sufferers operating very early in the processing of information (Harvey, Bryant, & Rapee, 1996; Bryant & Harvey, 1997) however other studies have produced incomparable results (Trandel & McNally, 1987).Dissociation symptomology can occur to varying degrees in PTSD, those symptoms that occur as a result of trauma commonly include emotional numbing, derealisation and depersonalisation and are directly related to the severity of the trauma (Holman & Silver, 1998; Morris, Kaysen, & Resick, 2000; Reynolds & Brewin, 1999).

Consistent with the former prognosis of PTSD (DSM-IV, APA, 1994) experiencing intense fear, helplessness, or horror at the time of the trauma are factors of cognitive-affective

reactions, Brewin, Andrews & Rose, (2000) found a strong relationship between victims of violent crime and risk of the development of PTSD six months later associated to fear and helplessness. Other studies have reported shame and anger to be the dominating emotions experienced after the event (Grey, Holmes, & Brewin, 2001; Holmes, Grey, & Young, 2003). Victims of trauma have also reported 'mental defeat' a state in which an individual may relinquish all efforts to retain their identity as a human being with a will of their own (Ehlers, Maercker, & Boos, 2000), this is particularly evident in victims of sustained and chronic trauma exposure (Ehlers et al. 2000). Subjective perceptions of threat in contrast to objective indicators have been shown to be more influential predictors of distress and failure to respond to treatment (Alvarez-Conrad, Zoellner, & Foa, 2001; Bernat, Ronfeldt, Calhoun, & Arias, 1998; Girelli, Resick, Marhoefer-Dvorak, & Hutter, 1986). Negative beliefs about the self, others and the world have also been found in PTSD sufferers (Dunmore, Clark, & Ehlers, 1999; Foa, Ehlers, Clark, Tolin, & Orsillo, 1999).

1.4.2 Early Theories

Early theoretical conceptions of PTSD have encompassed social-cognitive theories, conditioning theories and information processing theories.

Social-cognitive theories centred on the work of Horowitz (1976, 1986) Stress Response Theory (SRT) which proposed that when faced with a traumatic event an individual will respond with outcry at its realisation with attempts to assimilate the new trauma information with prior knowledge. Many individual's subsequently experience an information overload and are unable to provide cohesion with how their thoughts and memories were represented prior to the trauma. In order to counteract the tension, defence mechanisms are operationalised to counteract intrusive memories and the frequency of recall of the trauma. Denial may be a strong responsive factor ensuing numbing and avoidance, however the need to reconcile old and new information means intrusions occur in an attempt to assimilate the new information and reconcile them with pre-trauma representations. SRT proposes two opposing processes are at work, defence from the trauma through suppression of thought and the other being to assimilate the trauma and work through it. Therefore, oscillating from avoidance to intrusions of the trauma. This process allows the trauma to be worked through decreasing its intensity through each phase. SRT emphasises the impact of trauma on wider belief perspectives but fails to encroach on the difference between intrusions and ordinary memories of trauma, individual variations, peri-traumatic reactions, environmental factors, and the distinction of supressed

symptomology through successful recovery rather than successful avoidance (Brewin et al., 1996).

A further earlier influential social-cognitive model is the Theory of Shattered Assumptions (TSA). Janoff-Bulman (1992) proposed that there are three common assumptions we hold about the world as individuals that significantly influence our response to trauma, that the world is benevolent and meaningful, and the self is worthy. Generally speaking, other people are assumed to be well meaning, well disposed to others, and rules are reliable, and principles followed enabling the prediction of behaviours and outcomes. During a traumatic incident when our survivability is doubtful these beliefs are challenged and may contradict our own deep-rooted assumptions of how we hold the world and individuals within it to be. These assumptions are update in the manner of the processes involved in SRT (Horowitz, 1986). Similarly, to SRT, TSA's strength lies in the explanation of long-term effects of the disorder following trauma as opposed to its short-term implications. The components of TSA imply that individuals who hold positive assumptions are the most likely to be affected by traumatic incidents. Research, however, shows that the prior experience of trauma is one the highest predictors for development of PTSD (Resick, 2001; Brewin et al., 2000) therefore previously trauma exposed individuals should have lost some of their protective illusions about the world. Janoff-Bulman (1992) suggests that individuals with positive assumptions have greater initial distress but recover more rapidly, and that previous trauma would present a risk factor to individuals who had not re-established a secure and stable inner world.

Classical conditioning theories have also been applied to PTSD based on their previous application and development to the anxiety disorders. Two Factor Learning Theory proposed by Mowrer (1960) stipulates an initial phase of acquisition of fear through classical conditioning which results in neutral stimuli that may be present at the time of trauma exposure becoming fear eliciting in the individual through the association with the unconditioned stimulus (the elements of the trauma experience that produced fear). Numerous associated stimuli may be able to produce the fear response through stimulus generalisation and higher order conditioning (Keane, Zimering & Caddell, 1985). Repeated exposure to intrusions of the trauma would normally eradicate the associations, however if an individual supresses or develops avoidance this elimination would fail as the exposure is deemed incomplete and would be reinforced by a reduction in fear leading to the maintenance of PTSD. Conditioning theories fail to distinguish PTSD from other anxiety disorders; however, they encapsulate an explanation of the prominent features of PTSD in particular, the wide range of potential trauma

reminders, physiological and emotional arousal as a result of these and the role of avoidance in the continuation of PTSD. Conditioning theories fail when they are applied to re-experiencing symptoms, and effects on attention and memory, the role of appraisals and coping strategies and the influence of emotions other than fear, indeed with the amendments to DSM-5 (APA, 2013) fear is no longer a predominant prerequisite for PTSD diagnosis. Conditioning theories of PTSD are generally now enhanced by theory from a larger research pool based on cognition and memory (Pitman et al., 2000)

Cognitive theories such as information processing theories focus on the trauma incident itself as opposed to the personal and social contexts involved (Chemtob et al, 1988; Creamer et al., 1992; Foa et al., 1989; Litz & Keane, 1989). The primary context of the theories being that the traumatic events are processed differently in memory functions and as such if they are processed incorrectly psychopathology may result. The earliest theories (Lang, 1979) attempted to understand fear conditioning and phobia development. Lang adapted behaviourist conditioning theories of fear by incorporating more elaborate cognitive processing networks. Lang proposed traumatic events were represented in memory as interconnections between nodes, trauma memories were represented by three types of propositional information, stimulus information about the traumatic event, information concerning the individual's emotional and physiological response to the trauma, and meaning information concerning the level of threat to the individual. The model proposed that cognition and affect were integrated and thus created a response program designed to escape or avoid danger. The model echoed later evolutionary theory surrounding PTSD (Chemtob et al., 1988) asserting in individuals with PTSD fear networks becomes permanently activated to ensure survival for adaptive purposes.

Foa et al. (1989) suggested the distinguishing factor of PTSD in relation to other anxiety disorders is the significance of the traumatic event and its violation within individuals of previously held concepts of safety. Traumatic events lead to representations in memory that differ from memories created by everyday life, nodes that are created to form representations become much stronger during traumatic incidents in relation to general experiences of the same event. In this sense someone who is attacked in a location they frequent regularly, will form representative nodes of behavioural and physiological responses that are much stronger than the nodes that are created when potential trauma is not present in the same location when it is represented in a neutral or positive mood state. If the location for example is revisited or a very similar situation or scenario ensues the fear network within memory would be activated causing hypervigilance (arousal), with information from the network entering consciousness

(intrusions) and attempts to supress and avoid (avoidance symptoms). This fear inducing network is characterised by strong response elements, high numbers of environmental triggers and a low threshold for activation. Information in this fear network must be weakened for it to integrate with the individual's other memories. To reduce associations the network must be activated by imagined or situational exposure and then subsequently modified with compatible information. Symptoms in the form of intrusions continue to persist in the fear network because of the variation in the duration of exposure, as a result some associations are weakened but others remain strongly associated with fear (Foa et al., 1989).

Early cognitive models of fear inducing networks have enabled a clearer distinction as to how a traumatic event may be processed at the time and post trauma, and what types of cognitive functioning may be apparent during the process. Limitations of the models however are their difficulty in explaining the connections between how memories can produce rapid intrusion and physiological arousal but also produce vague and disorganised memories. They also fail to distinguish between intrusive memories and ordinary memories of the trauma, or disparate emotions and beliefs evident in PTSD patients.

Other theorists have argued for the similarity of panic disorder and PTSD (Barlow, 1988) the Anxious Apprehension Model emphasises a similarity between panic attacks and intrusion symptoms. As such biological vulnerabilities coupled with trauma and intense emotion and cognitive processing may produce heightened 'anxious apprehension'. PTSD invariably produces a focus of attention and hypervigilance to emotional alarms and stimuli, and in the absence of real potential trauma false alarms may occur as with panic disorder (Barlow, 1988). PTSD patient's anxious apprehension focuses on cues from the trauma and avoidance of disturbing recollections and feelings. These learnt behaviours initiate the hyperarousal symptoms and through the associations with similar cues present at the time of the trauma generate a negative cycle causing the intrusion symptoms. To prevent triggering of alarms an individual will avoid the emotional information generated through emotional numbing. Jones and Barlow's (1990) theory emphasises similarity with anxiety disorders, consistent with the model panic type symptoms are often reported by PTSD patients during and after trauma exposure (Bryant & Panasetis, 2001; Falsetti & Resnick, 1997; Nixon, Resick, & Griffin, 2004). However, whilst potentially highlighting an important aspect of PTSD it fails to highlight in detail the role and variety of emotions and cognitions that may follow from trauma exposure.

1.4.3 Evolutionary Theories

Evolutionary theoretical perspectives to PTSD (Cantor, 2005; Chemtob et al., 1988) have also been proposed as a potentially important consideration of focus because of the link between trauma exposures that humans in the environment of evolutionary adaptedness (EEA) would have faced coupled with the development of heightened vigilance, and the subsequent benefit to their survival as a result. It also provides a focus for the similarity between trauma exposure in the EEA and the current time period in terms of the similarities inherent with modern occupational roles and the risk of interpersonal violence. As fear is a key emotion in PTSD, evolutionary theories propose that its purpose may be to motivate defence. However, as PTSD is a debilitating disorder its function as a preventive disorder has been questioned, evolutionary theorists counter argue that what was once considered adaptive in a previous environment may not be so in another and that it is debilitating only because of its modern situational context (Blanchard, Yang, Herber & Blanchard, 2007).

Evolutionary theories of PTSD propose that the re-experiencing cluster of symptoms represent higher order memory functioning and learning experiences, coupled with hypervigilance and avoidance behaviours. Hominoids within the EEA who were exposed to potentially seriously threatening experiences may have promoted their long-term survival strategies if experiences were not forgotten (re-experiencing); remaining on an extended period of high alert (hyperarousal); along with avoidance of high-risk locations and strategies (avoidance behaviours) and utilised other defensive mechanisms determined by contextual demands. In this sense the theory proposes that evolutionary processes naturally selected for an enhanced mechanism promoting survival in context to situations of extreme threat to an individual. As hominoids evolved as a highly ordered social species this survival mechanism may also have had been selected for by the experience of witnessing potential extreme threats to conspecifics and thus adapting behaviours in response.

Intrusion symptoms have been found to intensify overtime in individuals with PTSD (Yehuda et al. 1998) but re-experiencing symptoms fade more quickly than avoidance behaviours and hyperarousal symptoms. In this sense evolutionary theory suggests that PTSD is a survival mechanism that promotes cautionary behavioural manifestations meaning the re-experiencing processes lessens the harshness of the experience overtime without its compete eradication and vigilance and avoidance promote survival capabilities even when the symptoms become overgeneralised. Evolutionary theory views re-experiencing symptoms as the mechanism by which learning, memory and prioritization of defence memories have occurred,

following seriously threatening exposure to dangers. Avoidance behaviours reflect avoidance, flight and numbing phenomena. The hyperarousal category of symptoms conceptualizes as hypervigilance phenomena, encompassing both ethological and physiological vigilance.

As PTSD is proposed to be a disorder of defence that is likely to use existing brain neuro-circuitry controlling defensive functions, the theory also suggests PTSD may well exist in many species. Evolutionary PTSD theory however is regarded by many as speculative, teleological and empirically untestable. It draws heavily on comparative psychology and although suggestions have been made for comparative research, studies into PTSD in other species are limited, those that exist do provide support for similar PTSD observed symptomology, and interestingly this predominates in higher social ordered mammals such as chimpanzees, elephants and canines (Ferdowsian et al. 2011; Whitaker, Gilpin & Edwards, 2014). Most importantly the theory fails to provide substantial explanation as to why PTSD occurs in only a proportion of individuals who are traumatically exposed, the theory is also predominately based upon symptomology criteria for DSM-IV which has now been updated to DSM-5 with notable differences particularly surrounding the NACM cluster of symptoms, and the re-categorisation of PTSD as a trauma related disorder distinct from anxiety related disorders, That said although evolutionary perspectives fail to fully explain how PTSD may develop and be maintained it does propose reasoning to its purpose and potential beneficial probabilities.

1.4.4 Current Theoretical Approaches

The most current theoretical perspectives of PTSD development centre on three pre-dominant theories, Emotional Processing Theory (EPT; Foa & Kozak, 1986), Dual Representation Theory (DRT; Brewin, Dalgleish & Joseph, 1996) and the Cognitive Model of PTSD (CM; Ehlers & Clark, 2000). The three theories are presented and critiqued in the following sections along with a broad overview of the literature surrounding each theory. Although this thesis did not directly test the theories in question an overview of all three has been provided to contextualise and explain the potential development of PTSD following trauma exposure. As all three theories display a degree of overlap, incorporating a wide range of findings on the importance of contributing factors to the development and maintenance of PTSD it is necessary to outline all three perspectives as opposed to isolating explanations for choice theories. Where the three theories differ is how the trauma impacts on memory and

processes and where the changes happen in memory, and how they relate to recovery. Memory disturbance and appraisal are accounted for as distinct aspects of PTSD in DRT and the CM in comparison to EPT. EPT relies on the conception of a single associative network in memory, in DRT trauma stimuli that is insufficiently processed to form ordinary autobiographical memories are stored in the two processing systems. In the CM the autobiographical memory system consists of higher order themes, personal time periods, and specific event related information. Poor incorporation of a traumatic memory into this autobiographical database leads to fragmented memory recollection and cue orientated intrusions.

1.4.4.1 Emotional Processing Theory

Emotional Processing Theory (Foa & Kozak, 1986; Foa et al., 1989) draws on many of the assumptions of earlier theories but emphasises that the memories of traumatic events are different from those of normal events. Traumatic events are said to violate the assumptions that people hold regarding concepts of safety. The central concept of the theory is the fear network that assumes a cognitive representation of fear within memory as well as emotional reactions and ongoing beliefs about levels of threat present within the environment. Foa et al., (1989) proposed the activation of one node (the scene of trauma) would automatically action the fear node and subsequent physical and behavioural responses. Activation would thus be noticeable in terms of hypervigilance, intrusion and re-experience to trauma cues, with accompanying physiological responses with attempts to supress or avoid intrusions.

EPT was later remodified (Foa & Riggs, 1993; Foa & Rothbaum, 1998) with an increased emphasis on the negative appraisals of behaviours and responses which could lead to increases in an individual's perceptions of incompetence. The modification incorporated the assumptions that the beliefs an individual may have held prior to trauma, during and after could interact and as such reinforce the negative schemas that involve danger and incompetence. Foa & Rothbaum, (1998) proposed this was the fundamental factor that underlies chronic PTSD. Further factors were also proposed that involved the treatment of trauma exposure, namely the highlighting that repeatedly reliving traumatic experiences could increase fear habituation and as a consequence reduce the levels of fear that are associated with specific recollections of the trauma as well as decrease the beliefs held that the anxiety maybe permanent. As such it was hypothesised this would ensure avoidance of the recollection of the trauma would become

negatively reinforced and this practice within a therapeutic environment could incorporate safety information into the trauma recollection.

Treatment of PTSD incorporating the methodology based on EPT by prolonging exposure has been established as an effective treatment for PTSD (Foa et al., 1991, 1999). Evidence suggests that the successful outcome of exposure treatment is supported (Foa, Riggs, Massie, & Yarczower, 1995; Pitman et al., 1996; Jaycox, Foa, & Morral, 1998) but it appears that it is necessary for a significant amount of habituation to occur in order to significantly increase its effectiveness as demonstrated by Van Minnen & Hagenaars (2002) findings, suggesting that it is the repeated re-evaluation of the associations surrounding the trauma that is the critical element in reducing the intrusive nature of the PTSD symptoms.

Furthermore, symptom improvement has shown to vary during treatment sessions and between them (Jaycox et al., 1998; Van Minnen & Hagenaars, 2002). With improvements being related to fear reduction between treatment sessions as opposed to a reduction in fear in treatment sessions, it has remained unclear however whether this is a result of habituation or the process of reappraisal.

The assessment of trauma narratives by analysing the complexity and level of articulation within them by measuring its reading ease found assault victims whose accounts reflected lower reading levels and greater reading ease had more severe PTSD symptoms three months later (Amir, Stafford, Freshman, & Foa, 1998) these findings however were found to be the polar opposite by Zoellner, Alvarez-Conrad, and Foa (2002). Replicated studies supported Amir et al. (1998) findings (Gray & Lombardo, 2001) but the effect disappeared when cognitive ability and writing skill was controlled for. The problems cited for the disparity of findings in these studies centre on the use of computer software programs that measure reading levels and unsubstantiated evidence that they may be related to other factors such as articulation of trauma memory for instance.

Consistent support has been found for the prediction of higher levels of disorganisation and fragmentation in trauma narratives related to dissociative responses (Harvey & Bryant, 1999a; Murray et al., 2002; Engelhard et al., 2003). Little evidence has been found that suggests dissociation leads to shorter and simplistic trauma narratives (Gray & Lombardo, 2001) high dissociation states were found to relate to more complex narratives (Zoellner et al., 2002). Research by Foa et al. (1995) on trauma narratives of rape victims at the commencement and end of exposure therapy found an increase in narrative length, an increase of thoughts and

feelings, particularly organisation of the trauma memory. Fragmentation however did not change and those narratives that did showed a reduction in trauma related anxiety but not depression whereas the reverse was true in those narratives that showed an increased organisation of recollection. Further studies (Van Minnen et al., 2002) that reported improvement in PTSD symptoms were associated with a decrease in disorganised thoughts, whereas other studies (Halligan et al., 2003) observed no significant associations between changes in memory disorganisation and changes in symptoms. Disparity in the findings associated in trauma narrative therapies have been attributed to the simplicity of the investigative studies which have been criticised for the focusing on one emotion rather than several (in particular fear) which may simply evoke feelings of fear to varying degrees by its prompting. A further problem appears to be that representation of knowledge with levels of meaning cannot be attained beyond that of the word or sentence, where it has further been proposed that meanings of emotion are far more complex, categorical and extremely difficult to capture in words.

EPT provides a complex and comprehensive explanation to PTSD, drawing attention to many important aspects relevant to the therapy and treatment of PTSD. The rigidity of beliefs deemed as problematic by EPT has helped to elaborate it further from the conceptualisation of TSA, regardless of whether the beliefs held are positive or negative, the theory has also been associated with very effective treatment for sufferers of PTSD using prolonged exposure therapy. There is a large amount of literature that supports the emphasis of pre-trauma risk factors and appraisal processes, however literature surrounding the other aspects of EPT are less established, in particular the mechanisms of change. Associative network models have also been criticised for their simplicity and inability to encapsulate complex clinical phenomena (Teasdale & Barnard, 1993; Johnson & Multhaup, 1992; Power & Champion, 1986) and to be flexible enough to account for the contradictory phenomena that is sometimes apparent.

1.4.4.2 Dual Representation Theory

Dual Representation Theory (Brewin et al., 1996, 2010; Brewin, 2008) provides a contrast to EPT proposing the traumatic memory is an ordinary memory with a particular structure. DRT postulates the trauma memories are represented in a distinct way, Terr (1990), van der Hart & Horst (1989), van der Kolk & van der Hart (1991) all suggest pathological responses attributable to PTSD occur when traumatic memories become dissociated from ordinary memory systems and recovery processes lie in the ability to assimilate the traumatic memories into ordinary memories.

Brewin et al.'s (1996) version of DRT proposed two memory systems operate in parallel, however one may take precedence over the other at different times. The intrusion symptoms of PTSD are proposed to be the result of enhanced coding surrounding certain aspects of the traumatic event which were previously referred to as situationally accessible memories (SAM; Brewin et al., 1996) and later sensation near representations (S-reps; Brewin et al., 2010) and reflects the fact that the intrusions occur as a direct result of involuntary situational reminders of the trauma, these can be encountered externally in the environment or internally within an individual's mental processes. The S-rep system incorporates information from a more extensive, lower level perceptual process of the trauma that is primarily sensory and provides an explanation as to why the intrusion symptoms often feel like they are occurring in the present as they lack a spatial and temporal context. The system also records information about the individuals' physiological response to the trauma, resulting in the intrusions being more detailed and emotion laden as opposed to ordinary memories.

DRT secondly proposes there is an impaired coding of the information in parallel contextualised representations (C-reps; Brewin et al., 2010) which were formerly referred to as the verbally accessible memory system (VAM; Brewin et al., 1996). C-reps represent consciously processed information regarding the trauma information that can be communicated to others. The trauma memory is therefore integrated with other autobiographical memories that can be deliberately retrieved when necessary. These memories however are restricted with the amount of information available because the process has only recorded what has consciously been attended to. The volume and detail of the information processed at the time is therefore restricted. The accompanying emotions incorporate 'primary emotions' that occurred at the time of trauma and 'secondary emotions' as a result of subsequent cognitive appraisals by the individual. Because the S–rep system unlike the C–rep system does not use a verbal code the memories are difficult to communicate and do not interact and update with other autobiographical knowledge. S–rep memories are difficult to control as they remain unregulated because they are predominantly made up of sensory information, therefore the memories that accompany them are restricted to 'primary memories' experienced during the trauma.

According to DRT (Brewin, 2008) the encoding of memories that occurs in the S-rep and C-rep systems may be a result of peri-traumatic dissociation reactions. The 'intrusive memories' or 'flashbacks' that ensue are postulated to be adaptive to encourage the encoding of information into contextualised representations that strengthen the connection between S-

reps and C-reps thus creating a memory representation relevant to the trauma with a temporal and spatial context. This subsequent awareness that the trauma has occurred in the past would then decrease the need for sensory memories in response to potential traumatic cues. In the case of PTSD, DRT proposes the re-encoding from S-reps to C-reps does not take place, and therefore leads to dissociation, fragmented verbal memory, coupled with persistent and intense intrusions. Furthermore, PTSD can be thought of as a hybrid disorder incorporating the two pathological processes, recovery from PTSD is purported to occur by addressing both of these processes. This occurs in several ways, through the assertion of perceived control, integration of new information with pre-existing beliefs and concepts and through the prevention of an automatic activating of the S-rep system regarding the knowledge of the trauma which overall reduces the negative emotions generated by the cognitive appraisal of the trauma. Whereas exposure treatments employed in EPT seek to produce new elements in regularities and patterns of the traumatic experience, the process by which symptomology is reduced is automatic, in contrast cognitive methods based on the theoretical concepts of DRT involve deriving clear rules, with deliberate evaluation which are modified verbally in therapy.

Neuropsychological studies have provided support for DRT, highlighting the brain region of the amygdala is activated in fear response and processing of trauma information (Brewin, 2001). Pathways that involve processing via the hippocampus provide coherent representations of conscious experience and are available for deliberate recall like C-rep memories. However, information can reach the amygdala independently of the hippocampus by more indirect faster routes and as a result these memories are not open to deliberate recall but could be accessed automatically via cued reminders, in particular perceptual features which are recorded in trauma memory. Stress in contrast to fear response has been shown to have a different effect on the amygdala and hippocampus (Cahill & McGaugh, 1998) which ensures that emotional events may be preferentially retained in memory. Intense prolonged stress correlated with high corticosterone impairs the functioning of the hippocampus reversing the improvement in declarative memory whereas the amygdala is enhanced by increases in stress levels (Bremner et al., 1995; Metcalfe & Jacobs, 1998).

These distinct memory pathways provide a neural basis for C-reps and S-reps and PTSD symptomology as proposed by DRT. In particular C-reps suggest encoding of memories dependent on the hippocampus perceived as occurring in the past. S-rep memories suggest encoding distinct of the hippocampus and are unable to be perceived distinctly from past and present. The lack of temporal context implies when memories are retrieved, they are

experienced as occurring in the present and the representation of threats lead to an attentional and memory bias (Ehlers & Clark, 2000).

Fear association network theories suggest single types of memory trauma, in contrast to this DRT proposes two types of trauma memory detected in the individual that occur concurrently. Empirical evidence for this has been supported by research (Brewin & Saunders, 2001; Holmes et al., 2002) supporting the claims of DRT that the intrusions which occur in PTSD are the result of different memory systems which are predominately visuospatial as opposed to verbal in nature. Hellawell & Brewin (2002) tested single versus dual representation theories in PTSD patients, they found support for S-rep systems indicating higher levels of physiological arousal and intrusion consistent memories in contrast to more attentive verbally orientated C-rep systems. DRT forms a basis for how trauma-focused cognitive behavioural therapy (CBT) can be applied (Brewin 2005). The process involves both the S-reps and C-reps, patients seek to focus attention on intrusion memories thereby re-encoding information into the C-reps which was formally only available in the S-rep system, thereby strengthening the connections between the two systems. As such patients can contextualise the memory as historical and the threat as no longer present reducing the overall intrusive symptoms.

DRT addresses observations regarding PTSD that are difficult to explain using single memory system theories by differentiating cognitive processes that occur post trauma from more extensive appraisals. However, DRT primarily focuses on memory, emotion and appraisal and does not encapsulate important features of PTSD such as dissociation and emotional numbing as well as increased condition ability.

1.4.4.3 The Cognitive Model of PTSD

Emotional responses to trauma are dependent upon cognitive appraisal, factors such as the individual's expectancies and perception of control over the situation have been elaborated by the Cognitive Model of PTSD (Ehlers & Clark, 2000).

The CM identifies a wider range of negative appraisals relevant to PTSD. The experiencing of extreme stress and the way an individual appraises potential threat is an essential factor in the occurrence of acute stress reactions, which all display biological, emotional and behavioural effects. If an ineffective regulation of these acute stress reactions occurs, it may result in an ongoing dysregulation which the CM postulates will result in PTSD symptoms occurring. The likelihood of negative appraisals occurring are based on the individual's peri-traumatic thought processes and prior beliefs and experiences. The concept

of ‘mental defeat’ (Ehlers, Maercker, & Boos, 2000) inhibits an individual’s ability to influence their fate and is a significant risk factor for negative self-appraisals, along with prior exposure to trauma may which acts in such a way an individual may appraise themselves as being vulnerable, weak, helpless and a target for hostility. The CM proposes that when an individual processes a sense of threat in this way it leads to the pathological symptoms seen in PTSD. The sense of the current threat may then be inward or outward focused leading to misgivings about the self or in distrust of other people’s intentions.

The negative appraisals that occur account for the range of emotions experienced by patients with PTSD. Because the nature of trauma memory is different from normal memory and is poorly elaborated and incomplete with spatial and temporal perception and inadequately integrated into autobiographical memory it perpetuates the sense of ongoing threat. Situations that involve similarities to the traumatic event may also evoke a strong sense of threat which occur in a cue driven and unintentional manner. Difficulties in intentional recall are also present as well as re-experiencing of the event in the present and the lack of connection to other relevant information. Similar to DRT the CM proposes memory of the trauma is poorly elaborated with insufficient context in terms of time and place, an important distinction from DRT however is the difference between data driven (sensory impression focusing) and conceptual processing (focusing on the meaning of the situation). Conceptual processing involves the integration of the trauma memory with autobiographical knowledge whereas data driven processing leads to perceptual priming and difficulty in the retrieval of the trauma memory. Other peri-traumatic factors result in inabilities to establish self-referential perspectives, dissociation, emotional numbing, and a lack of cognitive capacity to evaluate accurately. In the CM flashbacks and intrusions are thought to be the result of enhanced perceptual priming which are the result of a reduced perceptual threshold for the trauma related stimuli. A further important aspect of the CM is the behavioural and cognitive coping strategies which an individual adopts that maintain and onset the PTSD symptoms, behavioural strategies such as suppression of thoughts, seeking distraction, avoidance of the trauma reminders, use of alcohol and substance abuse, disengaging with normal activities, and adoption of safety behaviours are evident as are cognitive strategies that are employed such as persistent rumination, dissociation, and selective attention to threat cues.

The following research (as cited in Brewin & Holmes, 2003) has provided support for various aspects of the CM, mental defeat (Ehlers et al., 2000), rumination and safety behaviours with avoidance (Clohessy & Ehlers, 1999; Ehlers et al., 1998; Mayou et al., 2001; Murray et

al., 2002; Steil & Ehlers, 2000; Dunmore et al., 1999) thought suppression (Clohessy & Ehlers, 1999; Ehlers et al., 1998; Mayou et al., 2001; Steil & Ehlers, 2000) negative interpretations of others responses (Dunmore et al., 1997, 1999); perception of permanent change in self or life goals (Dunmore et al., 1999; Ehlers et al., 2000) negative trauma interpretations (Dunmore et al., 1997; Dunmore et al., 1999) negative interpretations of initial PTSD symptoms (Clohessy & Ehlers, 1999; Dunmore et al., 1997, 1999; Halligan et al., 2003; Ehlers et al., 1998; Ehlers & Steil, 1995; Mayou et al., 2001; Steil & Ehlers, 2000) and peri-traumatic dissociation (Halligan et al., 2003; Murray et al., 2002). Further studies have controlled for levels of initial symptoms and variables of mental defeat, negative interpretations of initial PTSD symptoms, safety behaviours with avoidance, negative interpretations of initial PTSD symptoms, rumination and thought suppression, and implications in the way PTSD symptomology develops after the initial period post trauma (Dunmore et al., 2001; Ehlers et al., 1998; Halligan et al., 2003; Mayou et al., 2001; Clohessy & Ehlers, 1999; Ehlers et al., 1998; Steil & Ehlers, 2000).

Cognitive therapies for PTSD based on the theory of the CM have proved effective in treatment (Bradley et al., 2005). Negative appraisals and cognitions are highlighted and sought to be replaced with more adaptive ones. Intrusive memories have been found to be represented by stimuli that were present before the moments of trauma and have the greatest emotional impact (Ehlers et al., 2002). These have been labelled ‘warning signals’ due to the fact they alert the individual to danger if it is reencountered. During therapeutic strategies ‘hotspots’ are sought in trauma narratives; these are the intrusions that are based on the strongest emotional impact for an individual. Focusing on these ‘hotspots’ in order to change their contextual meanings allow the symptoms of PTSD to be reduced (Ehlers et al., 2005).

The CM of PTSD provides a strong theoretical base to the disorder along with an effective CBT based therapeutic treatment strategy as well as what is currently the most detailed account of the theoretical perspectives of the maintenance of PTSD. Despite an extensive range of literature supporting the CM there have been problems identified (Holmes et al., 2002; Murray, 1997; Murray et al., 2002) namely, the measuring of trait or spontaneous trauma processing are consistently related to the experience of intrusions, with attempts to instruct individuals to process material in a particular way that tends to be ineffective. This has led to a number of implications including deliberate attempts to dissociate or engage in data driven processing are only weakly related to spontaneous reactions to trauma. Furthermore, issues have been identified in research regarding data driven versus conceptual processing,

research in this area is largely restricted to giving participants instructions on how to deliberately process relatively simple verbal or pictorial meaning (Roediger & McDermott, 1993) as such little is known about styles of processing that could be applied to more complex emotional material.

1.4.5 Conclusions

EPT (Foa & Kozak, 1986), DRT (Brewin et al., 1996) and the CM of PTSD (Ehlers & Clark, 2000) all display a degree of overlap, incorporating a wide range of findings on the importance of contributing factors to the development and maintenance of PTSD. Where the theories differ is how the trauma impacts on memory and processes and where the changes happen in memory, and how they relate to recovery.

Memory disturbance and appraisal are accounted for as distinct aspects of PTSD in DRT and the CM in comparison to EPT. EPT relies on the conception of a single associative network in memory, in DRT trauma stimuli that is insufficiently processed to form ordinary autobiographical memories are stored in the two processing systems. In the CM the autobiographical memory system consists of higher order themes, personal time periods, and specific event related information. Poor incorporation of a traumatic memory into this autobiographical database leads to fragmented memory recollection and cue orientated intrusions. The CM places more emphasis on the processing of stimuli during trauma as opposed to specific ways the output processes, data driven, and conceptual processing are represented in memory.

The CM differentiates general autobiographical memory from more specific sensory information known as event specific knowledge. It is proposed this event specific knowledge process may operate similarly to S-reps in DRT. Although DRT and the CM are aligned more closely of the three theories there are differences in certain predictions, they both make. Within the CM data driven processing during trauma is a risk factor for PTSD development, in DRT sensory information processing is only regarded as a developmental risk factor through overrepresentation in the S-rep system relative to the C-rep system. DRT also differs from EPT and the CM in the way disorganisation and fragmentation of the trauma memory are not deemed to be risk factors for PTSD, instead proposing it is the stimuli associated with high arousal during trauma represented in the C-rep system that is critical. All three theories support the notion of reliving the trauma to allow its elaboration and contextualisation but differ in the interpretation of the helpfulness of the process. EPT proposes it enables reintegration with the

rest of the memory network, therefore strengthening the associations of the trauma memory with external elements also. The CM suggests contextualising the trauma memory enables it to be sited in periods and themes of autobiographical memory inhibiting the retrieval of sensory and physiological intrusive responses in recollection of the trauma. DRT proposes contextualisation results in the creation of new memories in the C-rep system that prevent the amygdala reacting to traumatic reminders.

The three theories also differ in accounts of the process of psychological treatment for PTSD. EPT advocates the emphasis of incorporation of disconfirmation of information into the trauma memory but does not differentiate at a theoretical level changes brought about in the trauma memory by exposure, between sessions and cognitive reappraisal. DRT and the CM both propose the modification of the trauma memory and changes in appraisal by assessing the circumstances under which cognitive restructuring would best precede exposure work. The CM also proposes that it may be insufficient to carry out this cognitive restructuring in isolation and reappraisals may need to be incorporated into exposure sessions. DRT incorporates the notion that treatment can also induce new trauma memories competing with pre-existing representations as such which particular representations are retrieved will depend on factors such as, their accessibility, the match between cues and information in the memory, retrieval amount of representations that have been practiced, and the distinctiveness of the representations. However, researchers and practitioners are generally in unifiable agreement that social factors play a major part in the development and maintenance of PTSD and may moderate responses to trauma exposure. Perceived poor social support is well supported as a major risk factor to the development of PTSD following trauma (Brewin et al., 2000).

Some authors (Summerfield, 2001) have criticised the concept of PTSD arguing that culturally determined and understandable emotions to traumatic events are being pathologically categorised. Arguing PTSD is predominately a socio-political idea as opposed to a psychiatric illness, citing evidence such as its popularity and apparent prevalence in recent years. The concern primarily raised is the over diagnosis of PTSD as much as its actual existence. Concerns about the over diagnosis of PTSD are held by researchers who are not critical to its concepts, the stigmatisation of being pathologically categorised, and promotion of abnormal illness behaviour depleting a focus away from potential recovery. However, such a stance as is neither beneficial nor productive to the undoubtable physical and psychological symptoms that occur in a proportion of individuals who are exposed to trauma and develop aversive reactions with the obvious need for clinical address.

To date there is no unified theory regarding the development of PTSD that encapsulates and incorporates the principles and elements of, the CM, DRT and EPT that have been proposed. It is likely due to the complexity of the many factors involved that inherently a combination of the theories lays in the most comprehensive and accountable explanation as to its development. Furthermore, limited agreed consensus exists as to the most effective wholesale treatment strategy for PTSD and thus a combination of psychiatric treatment, medication, CBT, and counselling strategies appear to be the most effective approach to date.

1.5 TRAUMA EXPOSURE MEASURES

The impact of potentially traumatic experiences is considerable, findings show that prevalence and subsequent adverse psychological development may go undetected in a vast amount of cases (Jacobson, 1989). Furthermore, assessment of exposure may not routinely be carried out in clinical and research settings because available measures take too long to complete and do not assess other critically relevant information such as emotional impact.

Psychometric measures that can provide information about exposure to trauma can enable practitioners to better assess patients and formulate diagnoses and treatment plans. Researchers can also use such information to study the variability in exposure to events and responses and extend the understanding of why some events may cause traumatic stress in certain people. Furthermore, research on the long-term effects of traumatic stress can also be encapsulated by using a quick and efficient method of data gathering.

In view of this several self-report measures have been developed over the past 25 years to assess exposure to potentially traumatic experiences, high magnitude stressors, trauma related incidents and traumatic life events. These measures are generally referred to as trauma exposure measures, but most do not assess whether events are associated with significant or lasting psychological distress and as such further assessment measures and / or clinical diagnoses are often used to assess lasting psychological harm, the Brief Trauma Questionnaire (BTQ; Schnurr, Vielhauer, Weathers & Findler, 1999) 10 item self-report measuring lifetime trauma history, Davidson Trauma Scale (DTS; Davidson et al., 1997) self – report of 17 items measuring current past week PTSD symptoms, Distressing Event Questionnaire (DEQ; Kubany, Leisen, Kaplan & Kelly, 2000) self-report 35 items measuring PTSD symptoms for multiple events over lifetime, Evaluation of Lifetime Stressors (ELS; Krinsley, 1996) structured interview of 56 items measuring lifetime trauma history, Impact of Event Scale Revised (IES-R; Weiss, 2004) self-report of 22 items measuring current past week PTSD symptoms, Life Events Checklist for DSM-5 (LEC-5; Weathers et al., 2013) 17 items self-report measure for lifetime trauma history, Life Stressor Checklist - Revised (LSC-R; Wolfe, Kimerling, Brown, Chrestman & Levin, 1997) 30 items self-report measure for lifetime trauma history, Stressful Life Events Screening Questionnaire (SLESQ; Goodman, Corcoran, Turner, Yuan & Green, 1998) 13 items self-report measure for lifetime trauma history, Trauma Assessment for Adults (TAA; Resnick, Falsetti, Kilpatrick & Freedy, 1996) self-report

measure of 17 items for lifetime trauma history, Trauma History Questionnaire (THQ; Hooper, Stockton, Krupnick & Green, 2011) structured interview of 24 items measuring lifetime trauma history, Trauma Symptom Inventory (TSI; Briere, 1996) structured interview of 100 items measuring last 6 months trauma related symptoms, Traumatic Events Questionnaire (TEQ; Vrana & Lauterbach, 1994) 9 items self-report measure of trauma history, Traumatic Life Events Questionnaire (TLEQ; Kubany et al., 2000) 23 item self-report measuring 22 types of potentially traumatic events, The Trauma History Screen (THS; Carlson et al., 2011) 14 item self-report measure of trauma history.

The stated measures primarily seek to assess criterion A, eligibility for diagnosis of PTSD defined by the DSM (APA, 2000, 2013). Within the DSM-IV, criterion A eligibility stated "the individual must have been exposed to a traumatic event in which both of the following had been present: the person has experienced, witnessed, or been confronted with an event or events that involve actual or threatened death or serious injury, or a threat to the physical integrity of oneself or others and the person's response involved intense fear, helplessness, or horror" (APA, 2000, p. 424) within DSM-5, criterion A eligibility states "the individual was exposed to: death, threatened death, actual or threatened serious injury, or actual or threatened sexual violence, in the following way(s): direct exposure, witnessing the trauma, learning that a relative or close friend was exposed to a trauma, indirect exposure to aversive details of the trauma, usually in the course of professional duties (e.g., first responders, medics;" APA, 2013, p. 274).

The measures listed assess eligibility for PTSD by posing questions to ascertain responses to a generalised event that meets the DSM criterion A terminology i.e. have you ever witnessed someone's death, have you ever been inflicted with a life-threatening injury by another person etc. Certain measures seek to ascertain if this has occurred more than once, whilst others such as the Trauma History Screen (THS; Carlson et al., 2011) expand this element further by assessing perceived emotions, thoughts and feelings at the time of the event, The THS, was designed to address the issue that available measures that gather information about individual's exposure to traumatic stressors are too long and complex for use in many settings. The THS, was developed to provide a very brief and easy-to-complete measure of exposure to high magnitude stressor events and of events associated with significant and persisting posttraumatic distress. A varying element of the THS is that the distress associated with persisting posttraumatic distress events could take the form of PTSD symptoms but could also manifest as other anxiety symptoms, depression, or other behavioural disorders. The THS

however like other measures listed previously ascertain trauma exposure in a generalised manner and do not make specific reference to singular, context specific variables of potential trauma exposure that may occur as a result of professional occupational hazards for instance. The development of such context specific trauma exposure scales in the literature is limited.

The Combat Exposure Scale (CES; Keane, Fairbank, Caddell, Zimering, Taylor & Mora, 1989) is a 7 item self-report, context specific measure of combat exposure in military personnel. The CES measures the intensity of an individual's exposure to combat situations, by deducing to what extent a combatant has been exposed to a particular situation that may be deemed traumatic in itself, or which may have led to a potentially traumatic experience, further measures however are then needed to identify the specific traumatic exposure prompted by some of the scales items and further measures / assessments are also needed to identify potential adverse psychological outcomes. The Deployment Risk and Resilience Inventory (DRRI; King, King, Vogt, Knight. & Samper, 2006) is a 14 measure, 201 item, self – report to assess key psychosocial risk and resilience factors for military personnel and veterans deployed to war zones or other hazardous environments. The inventory comprises 14 separate measures assessing features of pre-deployment background, deployment-related experiences and perceptions, and post-deployment events and circumstances. The 14 measures have good content and predictive validity for adverse psychological outcomes, PTSD, depression and anxiety. Each of the measures in the DRRI can also be used as a stand-alone instrument. Of particular note in the context of trauma exposure is its ability to assess pre-deployment stressors, perceived threat level, combat experience, aftermath of battle and post-deployment stressors in 5 of the 14 measures. The Critical Incident History Questionnaire (CIQH; Weiss, Brunet, Best, Metzler, Liberman et al., 2010) indexes cumulative exposure to traumatic incidents in police officers by examining incident frequency and rated severity. It is a 34-item self – report measure that measures context specific traumatic incidents police officers may encounter in the course of their duties. The University of California, Los Angeles, Life Adversities Screener (LADS; Liu, Prause, Wyatt, Williams, Chin et al., 2015) is a 21 item self-report context specific measure of life adversities with predictive validity for depression and PTSD and comorbidity in African Americans and Latin Americans, 5 domains of mental health risk are assessed including perceived discrimination, sexual abuse histories, family adversity, intimate partner violence, and trauma histories.

The advantages in developing such context specific measures are apparent in the specific situational, cultural, organisational and occupational populations that they target to

assess. Isolating context specific trauma exposure from general life history trauma events can help establish the essential differentiation between the two situational exposures and help ascertain magnitudes and frequencies within specified populations and individuals thus enabling more detailed post trauma treatment diagnosis and strategies. Such measures may also enable clinicians, researchers and others with vested interests to better ascertain where and which exposures to potentially traumatic events may be problematic within the working environment for example, of collective or individual employees, and how repeated exposure to specific traumas may lead to adverse psychological outcomes, chronic maladaptation and other negative health related outcomes.

The need for context specific measures of Trauma Exposure and PTSD in specified populations has been highlighted, Stover & Berkowitz (2005) conducted a critical review of assessment measures available for the evaluation of potentially traumatic events and posttraumatic stress disorder symptoms in children under six years of age. Stover & Berkowitz (2005) critiqued available measures designed for assessment of trauma exposure and PTSD in children, highlighting many of the measures reviewed are administered to parents only stating this does not allow for direct assessment of what the child has experienced and relies entirely on parent's awareness of their children's experiences, and also limits the ability to identify trauma exposure in children as a direct result of parental abuse and neglect, which has also been identified as a major pre –cursor to PTSD in children (Ford et al., 2000). There are similar calls for alternative assessment measures of trauma and posttraumatic stress symptoms in people with severe mental illness, O'Hare, Shen & Sherrer, (2013) have compared different approaches to measuring traumatic events: the index trauma, whether the event "ever occurred," "lifetime frequency" of occurrence, and client self-reported "subjective distress" associated with these events to determine which approach was more positively correlated with posttraumatic stress symptoms while controlling for other psychiatric symptoms, levels of functioning, and gender, it was found physical abuse, sexual abuse, and unexpected losses would account for more variance in posttraumatic stress symptoms than other trauma and that total subjective distress would explain more variance in posttraumatic symptoms when compared with index traumas, total types of trauma experienced, and total frequency of traumatic events. They proposed further research is needed to compare various approaches to measuring stressful and traumatic events and how they correlate with posttraumatic stress symptoms while controlling for key psychiatric symptoms and related psychosocial problems and suggested that because most researchers have not controlled for other symptoms and

variables when measuring the relationship between trauma and PTSD, it remains unclear what the unique associations are between trauma and PTSD.

PTSD symptoms have been shown to correlate with psychological disorders such as depression and anxiety (Marshall, Schell, & Miles, 2010), Mueser et al., (2002) have suggested that posttraumatic stress symptoms mediate trauma and other psychiatric symptoms, it also seems likely that some events could exacerbate other psychiatric symptoms such as depression, psychosis, or mood dysregulation directly, and indirectly increase posttraumatic symptom load and longitudinal research is needed to better illuminate these pathways. In addition to not controlling for co-occurring symptoms, there has been little research comparing different approaches to measuring trauma. Tolin and Foa (2006) have noted ambiguities regarding what constitutes a criterion A event (APA, 2000) and perhaps an overreliance on the "worst" (i.e., index) trauma rather than assessing the effects of both multiple types and incidents of trauma and other highly stressful events.

Context specific measures in the literature that have been used to ascertain trauma exposure in prison personnel specifically are limited, as are attempts to provide cohesion in using generalised trauma measures. With reference to prison personnel, Slade & Lopresti (2013) researched resilience in prison staff in England & Wales aiming to outline the potential impact on staff of the experience of different challenging experiences in relation to personal resilience, emotional labour and working relationships and explore the factors in the prison environment, types and level of experience and personal factors which promoted resilience in prison staff. As well as using established psychometrically validated measures, prison personnel were asked about twelve unique challenging situations or experiences pertaining to working in a prison environment and asked to record the frequency the events had happened to them for the analysis of the study. Results showed seven of the identified experiences as having some level of impact on staff, with five types of experience with no identified pattern of impact. The Violence Injury and Death Exposure Scale (VIDES) (Denhof & Spinaris, 2014) is a 12-item self – report measure of direct and indirect exposure to potentially traumatic events, intended for commercial purposes and use in different organisations where exposure to violence or death may be a consequence of the occupation in question. It has been psychometrically validated in large samples of U.S Correctional Facilities Personnel (Denhof & Spinaris, 2013, 2014) with predictive validity for PTSD, depression, anxiety and comorbidity symptomology.

1.6 PTSD AND TRAUMA EXPOSURE IN RISK ASSOCIATED OCCUPATIONS

Potential exposure to trauma is a consequence of certain work occupations that are routinely expected to deal with, experience and witness traumatic incidents of a potentially catastrophic nature. Most industrialised and developing countries are equipped with organisations such as Armed Forces, Police Forces, Firefighting Services and Medical Services. Of interest are frontline occupations where exposure to violence, injury and death is a matter of routine such as combat personnel, police officers, paramedics / first responders and firefighters. There is to date a wide array of literature surrounding the potentially adverse psychological outcomes of such traumatic exposure within these occupations (Perrin et al., 2007, Corneil et al., 1999, Fulton et al., 2015, Gates et al., 2012) and the potential for the development of PTSD. The following section will briefly review the PTSD literature surrounding these occupations and although unexhaustive it provides a generalised overlook of the potential for and prevalence rates of trauma exposure and PTSD development. It must be noted that this section encompasses the more widespread and universal trauma exposed occupations but 'at risk' occupations may also entail the work of frontline first responder organisations such as, mountain and cave rescue services, coastguard and lifeboat services for example.

1.6.1 PTSD and Trauma Exposure in Military Personnel

Military personnel have been of particular interest to PTSD researchers, because combat personnel fulfil the ideological stereotype of the trauma exposed PTSD victim, and traditionally the historical diagnostic development of the condition has centred on studies and observations of combat exposed soldiers. War in general and particularly combat, exposes civilians and soldiers to potential physical and sexual violence, death, threatened death, captivity, torture, sustained abuse or the witnessing and indirect involvement of all of these factors on an individual, combatants may also face the added exposure of taking life as well, directly and indirectly. It can be argued that in no other environment is there a sustained potential for individuals to be exposed to the quantity, variety and severity of trauma both psychological and physical as there are during times of war.

PTSD within military settings has often been referred to by the labels 'combat stress', 'combat stress reaction', and 'combat operational stress reaction' (Campise, Geller & Campise,

2006) rather than the traditional diagnostic term of PTSD, this is partly to distinguish the uniqueness of exposure to warfare, it has also been argued by some researchers to be a separate and distinct form of PTSD, military personnel have often been found to not report feelings of 'fear, helplessness or horror' but to meet all other diagnostic criteria for PTSD (Alder et al., 2008). Behaviours such as 'hyperarousal' are sometimes considered to be functional and potentially advantageous in a military setting as opposed to a civilian one.

The National Vietnam Veterans Readjustment Study (NVVRS; Kulka et al., 1990) was a population-based study that incorporated three cohorts, Vietnam veterans, Vietnam era veterans (who did not serve directly) and a community-based sample. PTSD was found to be more prevalent for Vietnam veterans with men recording a rate of 15.2% for current PTSD significantly higher than that recorded for Vietnam era veterans (2.5%) and civilians (1.2%) with lifetime rates recorded at 30.9% for Vietnam veterans. Female veterans also recorded a current rate of 8.5% and a lifetime rate of 26.9%, suggesting exposure to the war zone was enough to elevate the rates irrespective of direct or indirect combat involvement (women did not serve on the frontlines during Vietnam but were predominately deployed as nursing personnel). Rates of major depressive disorder and psychiatric comorbidity were also found to be significantly higher within the Vietnam veteran's sample. Schlenger et al., (1992) found current PTSD rates in male personnel of 36% exposed to high combat stress compared with 8% exposed to low to moderate stress. Re-evaluation of the NVVRS data (Dohrenwend et al., 2006) was carried out due to inconsistences in the methodology employed (namely, sample analysis procedures) in the initial study (NVVRS; Kulka et al., 1990) and found lower current and lifetime PTSD rates (9.1% and 18.7%) although these were still significantly higher than the general population, the highest rates of current and lifetime PTSD were found within veterans exposed to the highest levels of war zone stress. A number of inconsistencies relating to the classifying of what composed levels of 'combat stress' were evident in the first study and were subsequently evaluated at a whole PTSD level in the second study as opposed to categorising the level of stress. Despite this both studies indicated that despite a heavy toll of PTSD amongst veterans the majority did not develop war related PTSD.

The Vietnam experiences study (VES; US, Centres for Disease Control, 1988) reported that several other disorders were more prevalent than PTSD amongst veterans, major depression (4.5% vs 2.3%), generalised anxiety (4.9% vs 3.3%) and alcohol abuse or dependence (13.7% vs 9.2%). However, for those with current PTSD, comorbidity was common 66% meeting criteria for major depression and / or generalised anxiety and 39% for

alcohol abuse or dependence also. Further studies conducted to generalise the NVVRS and VES studies and discrepancies centred on methodology (Thompson, Gottesman & Zalewski, 2006) found much lower lifetime and current PTSD rates amongst veterans, however these were again still significantly higher than general population figures. Despite the many re-evaluations several commonalities of research into Vietnam veterans have arose, notably that PTSD was the most common psychiatric disorder reported and diagnosed as a consequence of the war and occurred in comorbidity with other psychiatric disorders more prevalently than PTSD alone.

The first Gulf War (1991) was unusual in its brevity, in that ground operations only lasted one week before the liberation of Kuwait, combat fighting was limited to small isolated areas, however the potential for the witnessing of loss of life was prevalent as troops moved through the country during the liberation, rendering aid and restoring order to Kuwait. Research has showed a prevalence of 12.1% for subthreshold PTSD in US combat troops post theatre with the degree of combat exposure strongly correlated with PTSD, with 3.3% for minimal exposure to 22.6% for high level exposure (Kang et al., 2003). Further studies of US personnel deployed to Kuwait show rates of 6.2% for PTSD, 7.1% for major depressive disorder, 1.2% for panic disorder and 1.9% for specific phobias (Toomey et al., 2007). Extensive fighting within two recent major conflicts, the second Iraq war (2003) and the deployment to Afghanistan (2001- 2016) led to a significant increase and recognition of combat related trauma being the focus of scientific research. The potential for exposure to conflict and trauma was extremely high with many soldiers and civilians receiving catastrophic life changing injuries. PTSD studies regarding these conflicts show a prevalence of 9.2% for PTSD post deployment and alcohol misuse of 25.4%. Rates corresponded to levels of combat exposure, with those recording involvement in five or more firefights increasing to 19.3% for PTSD (Hoge et al., 2004). The Post Deployment Health Assessment (PDHA; Hoge, Auchterlonie & Milliken, 2006) and the Post Deployment Health Reassessment (PDHRA; Milliken, Auchterlonie & Hoge, 2007) was carried out on samples of over 300,000 US military personnel. Of the number of mental health disorders assessed during the PDHA, PTSD proved to be the most common amongst personnel deployed to Iraq (9.8%) and Afghanistan (4.7%) of those screening for PTSD 79.6% reported exposure to direct combat. The PDHRA data indicated that PTSD rates increased significantly over time following deployment (16.7%). Furthermore, data for the PDHA and PDHRA was collected in 2003, one month into the start of the deployment to Iraq and two years after the deployment to Afghanistan, both conflicts were to last another eight

and thirteen years respectively. Further studies by Hoge et al., (2007) indicated that PTSD remained at a stable rate (16.6%), however PTSD rates for personnel injured during combat were much higher (31.8%) in comparison to uninjured personnel (13.6%). Later research (Schell & Marshall, 2008) indicated a PTSD and depression prevalence rate of 14%, one third of the sample had returned from their last deployment 36 months previous indicating the potential longevity of PTSD symptomology.

1.6.2 PTSD and Trauma Exposure in Firefighters, Paramedics and First Responders

Potential trauma exposure within occupations such as firefighters, paramedics and first responders is fairly unique in that the potential trauma exposure does not routinely involve conspecific trauma potential through violent exposure like other 'at risk' occupations such as military and police personnel. This is primarily because the trauma exposure entails the witnessing of violent trauma as opposed to the subjection to it, however there is certainly the potential for loss of life and serious injury amongst firefighters because of their occupational role. Within certain countries such as the US firefighters and paramedics assume the same roles whereas in other countries such as the UK, they are organisationally distinct services. Significant events such as 9/11 in the United States have brought attention to trauma exposure experienced by firefighters, paramedics and first responders (Berger et al., 2012). It is estimated in the US alone these services respond to 50 million emergency calls annually, and although events such as 9/11 are unprecedented in their magnitude each despatch of personnel has the potential for a myriad of potential trauma exposure to personnel. Events can range from fatal vehicle accidents, fires, natural disasters, and the aftermath of violent incidents. The nature and frequency of these events has been shown to put personnel at significant risk of the development of psychological illness, particularly PTSD (Haugen, Evces & Weiss, 2012).

Literature reviewed by Jones, Nagel, McSweeney, & Curran, (2018) on twenty seven studies between 1998-2015, specific to firefighters and paramedics, in relation to daily-duty trauma exposure, showed prevalence rates of 4-30% for PTSD and 4-22% for anxiety. Problems were found to emerge as early as post initial training and persist after retirement. Despite the disparate rates it indicates there is the potential for significant trauma exposure leading to adverse symptomology from the first day of operational service and this may endure over time. Suicide rates of 15% were found to occur amongst retired personnel. In their own study Jones et al., (2018) found rates of 14% for moderate-severe and severe depressive symptoms, 28% for moderate-severe and severe anxiety symptoms, 26% for significant symptoms of PTSD, and 34% indicating high risk for suicide. Significant differences were

found for female personnel, shift structures, and medical histories of hypertension. Early studies found prevalence rates of 22% and 17% respectively for US and Canadian firefighters and paramedics (Corneil et al., 1999), with paramedic rates in the UK of 22% (Bennett, Williams, Page, Hood, & Woollard, 2004; Clohessy & Ehlers, 1999). Meta-analysis studies report a worldwide prevalence rate of 10% (Berger et al., 2012). A further recent meta-analysis of literature conducted solely on ambulance personnel, concluded a prevalence rate of 11% for PTSD, 15% for depression, 15% for anxiety, and 27% for general psychological distress (Petrie et al., 2018). The stated findings suggest that exposure to trauma and potential development of psychological illness is particularly problematic in this cohort regarding the role entailment of individuals, which is evident in the similarity of findings internationally.

Differentiation of PTSD symptomology has also been found amongst first responders in comparison to military personnel and veterans (Boyd et al., 2018) Compared with first responders, military personnel and veterans showed higher levels of derealisation, functional impairment, alexithymia, anxiety, and depression. Marmar et al., (2006) identified several significant risk factors for development of PTSD in police officers and first responders, higher peritraumatic stress, higher peritraumatic dissociation, higher routine work environment stress and lower levels of social support. Peritraumatic dissociation in first responders has further been associated with a greater likelihood of developing PTSD (Galatzer-Levy, Madan, Neylan, Henn- Haase, & Marmar, 2011; Maia et al., 2011). The nature, severity and repetition of exposure to traumatic events has been found to influence the prevalence of PTSD amongst firefighters, paramedics and first responders. Higher PTSD rates have been associated with previous disaster experience, higher exposure and the assisting of survivors (Fullerton, Ursano & Wang, 2004). Despite the identification of the risk for development of PTSD following natural disasters limited research has been carried out on the potential significance of mass conspecific violence incidents on PTSD development. A systematic review (Agaibi & Wilson, 2005) found a disparate range of between 4-20% for PTSD amongst first responders in relation to mass terror attacks and has highlighted the need for further research within this area to identify possible variations in the context of typology of trauma exposure. However, some evidence exists to suggest that terrorist related incidents may create more negative psychological consequences in survivors than exposure to natural disasters (Norris et al., 2002).

Overall prevalence rates for PTSD amongst firefighter's ranges from 17% to 22% (Vieweg et al., 2006). Although PTSD prevalence amongst firefighters has been found to be potentially much higher in non – western countries at rates of 57% (Alghamd, Hunt, & Thomas,

2013). Research into firefighters attending the World Trade Centre disaster, indicated an elevation risk for the development of PTSD over time, rising from 9.8% to 10.6% prevalence rates over a four year period (Berninger et al., 2010). Studies into Australian firefighters have shown experiencing multiple sources of trauma, and higher levels of organisational and operational stress, were all significant predictors of PTSD symptoms (Armstrong, Shakespeare-Finch, & Shochet, 2014). Studies on Korean firefighters have found individual resilience to be a key moderator in the association between traumatic stress and PTSD symptoms, firefighters with high levels of resilience were protected from both the direct and indirect impacts of traumatic stress (Lee, Ahn, Jeong, Chae, & Choi, 2014). These findings were also replicated in a sample of firefighters from Nigeria (Onyedire, Ekoh, Chukwuorji, & Ifeagwazi, 2017) showing higher resilience levels were negatively correlated with PTSD symptoms. Amongst firefighters from Portugal, levels of perceived threat were found to moderate the association between psychopathology and PTSD (Pinto, Henriques, Jongenelen, Carvalho & Maia, (2015).

1.6.3 PTSD and Trauma Exposure in Police Officers

Several studies have shown that law enforcement is one of the most stressful occupations worldwide (Aytac, 2015; Lau, Hem, Berg, Ekeberg, & Torgersen, 2006; Anshel, 2000). Mental health related problems for police officers in Northern Ireland have risen in the last several years affecting their ability to optimally perform their duties as police officers. Figures show that officers missed 37,674 days of work in 2017 due to mental health illness. This number has increased by more than 60% over the last three years (McDonald, 2016). Historically policing in Northern Ireland has presented serious challenges and added risks to officers with exposure to potential terrorism, however this has abated since the Good Friday agreement of 1998 but threats and the need for vigilance remain high in the wake of dissident republican terrorist groups continuance, potentially exacerbating levels of stress amongst officers.

Research has highlighted the demand of police officers work, demonstrating the potential to deal with a high number of potentially traumatic incidents (Violanti, 1996). Police officers can experience serious injury while on duty, also witnessing the serious injury or death of a colleague or member of the public, life-threatening incidents against themselves or others, and various other forms of trauma as a requirement and hazard of their occupational role entailment (Atkinson-Tovar, 2003; Cross & Ashley, 2004; Karlsson & Christianson, 2003; Papazoglou, 2013).

Studies have demonstrated the potential for repeated exposure to traumatic events to be predictive of developing PTSD (Moran & Britton, 1994; Green, 1994; Violanti, 1996). Troop and Hiskey (2013) have further demonstrated exposure to numerous traumatic events could exacerbate PTSD symptomology in contrast to the experiencing of a single event. The type and nature of events therefore that police officers deal with potentially expose them to the experiencing of repeated trauma exposure and PTSD. Weiss et al., 2010 utilising the Critical Incident History Questionnaire in a sample of large US urban Police departments, found that individual officers had been exposed on average to 168 potentially traumatic incidents over the course of their careers. Chopko, Palmieri & Adams (2015) utilising the same instrument reported an average of 188 per individual officer in small and midsize agencies. Studies have shown that the prevalence of PTSD in police officers (Mann & Neece, 1990; Carlier, Lamberts & Gersons, 1997; Robinson, Sigman & Wilson, 1997) maybe insignificant in comparison to general population figures (Carlier et al, 1997; Kessler et al, 2005; Vries & Olff, 2009). However other studies have shown prevalence rates of 26% (Martin, McKean & Velkamp, 1986). Higher rates have been observed in police officers exposed to shootings highlighting that the severity and typology of the trauma exposure may exacerbate PTSD (Stratton, Parker & Snibbe, 1984; Manolias & Hyatt-Williams, 1993). Studies in police officers taking early retirement in New Zealand have shown prevalence rates of 43% with the reason of exposure to trauma cited as the significant precursor for leaving service (Stephens & Miller, 1998). Recent studies indicate a prevalence rate of PTSD between 4.5 and 9% (Berger et al., 2012; Maia et al., 2007) with rates of 15-16% with subthreshold PTSD (Maia et al., 2007; Marmar et al., 2006). Police officers have also been shown to develop emotional or behavioural symptoms, burnout, negative attitudes towards people, suicidal ideation, alcohol abuse, anxiety, depression and other psychosomatic symptoms (Chopko, Palmieri, & Adams, 2018; Hartley et al., 2012; Lawson, Rodwell, & Noblet, 2012; Stanley, Hom, & Joiner, 2016). Research into a large sample of police officers who attended the World Trade Centre disaster 10 years on, showed a prevalence rate of 21.8% with PTSD, and 12.9% with subthreshold PTSD, (Bowler et al., 2016). A large proportion of PTSD research within police officers has involved cross comparisons with civilian samples and has been open to criticism. More specific research has been carried out to directly compare police officers, distinguishing between those exposed to traumatic events and those who hadn't, findings identified no difference in levels of PTSD (Alexander & Wells, 1991), however this research has been critiqued as it failed to distinguish between typologies of trauma exposure between a group subjected to one specific traumatic incident and a control group that had not, but who had been trauma exposed in other incidents.

However, for officers in both groups who did not present with PTSD, both were exposed to significant previous trauma in regard to their occupation and as such it was proposed resilience may have been a protective factor, although this was neither tested nor controlled for.

As a consequence of the discrepancies between rates of PTSD prevalence amongst police officers, researchers have proposed that officers may be better able to cope with the management of trauma exposure and may therefore have diminished levels of PTSD development in comparison to other trauma exposed occupations. Certain research suggests that repeated and chronic exposure to trauma may develop systems of learning to deal over time with the trauma, limiting the effects of the trauma exposure and potential for developing adverse symptomology. It has been proposed that this may occur in police officers as an effect of 'police culture' (Papazoglou, 2013) and that police officers may become 'hardened.' Hardiness has been shown to potentially buffer and protect from PTSD symptomology amongst police officers (Huart, El, Potard, & Courtois, 2017). Other research supports this notion suggesting that police become emotionally detached after their first eighteen months in the role, (Singleton & Teahan, 1978) whereas other research suggests that it takes police officers at least eleven years to be less likely to indicate PTSD (Robinson et al, 1997). There is however difficulty in distinguishing between emotional detachment, resilience and hardiness, it has been suggested that these are the same construct and / or separate variables with significant overlap (Caska & Renshaw, 2013; Lee et al., 2014). Furthermore, research has found in certain individuals' exposure to repeated trauma may increase resilience; whereas the reverse can also be true (Figley, 1985, 1986; Wilson, 1989, 1995; Wilson & Raphael, 1993; Wilson & Drozdek, 2004). Other research suggests post traumatic growth in police officers is influenced by whether or not direct or indirect trauma exposure was experienced regardless of the level of experience (Chopko, Palmieri, & Adams, 2018).

Criticism regarding rates of PTSD in Police officers has proposed this may be due to the difficulty in discerning work related and non-work-related stress (the extent to which personal issues e.g. in marriage, financial difficulties etc. may play a contributing factor) as well as occupational (role related stressors, i.e. trauma incidents) and organisational related stressors. PTSD studies amongst police officers have also been criticised for failing to separate and control for these factors and the contribution each may make to the presence of symptoms (Chopko et al., 2018). Plat et al., (2013) however, identified a negative association regarding personal trauma exposure and work-related trauma exposure with the latter being found to be

much higher. Therefore, inferring that stress that leads to development of PTSD is work related, trauma related, and a result of occupational stressors.

A further factor that may produce discrepancies on the prevalence of PTSD amongst Police officers is the lack of official Police organisational statistics, thus creating an over reliant focus on self-report study. PTSD has become better understood in recent years however hardened cultures that exist within organisations such as the police may create a 'taboo' effect surrounding PTSD and individuals may not wish to appear weak or unable to cope in front of colleagues. Violanti, Mnatsakanova and Andrew (2013, p. 39) have stated "Police officers may also be ashamed to acknowledge suffering from a traumatic event because they are stereotypically seen as emotionally strong individuals, in the perceptions of the general public, in turn this could affect the likelihood of developing PTSD because they may not face the symptoms of PTSD and deal with them effectively, thus exacerbating the symptomology."

1.6.4 Prison Personnel

Within prison establishments various types of personnel are employed that facilitate a variety of occupational roles fulfilling the growing complex needs of prison systems. Such roles include but are not limited to, managerial governors and wardens, administration staff, chaplains, works personnel, healthcare professionals, psychologists, and probation officers.

It is important to note that there are discrepancies between countries in the approach to prisonisation and this has impacts on generalisation. General practices within the developed world are for the most part similar in their respective approaches, generally running models as outlined above, with most if not all state-run funding, accountability and some monitoring of procedure. Developing countries, however, often lack significant state funding, have significant problems with corruption due to inadequate polices and control and generally lack any rehabilitative approach. That said all countries predominately employ some form of personnel to control and monitor the prison population and consequently these personnel are exposed to very similar potentially hostile outcomes from prisoners.

Perhaps the most well-known, numerous and long-established are correctional and prison officers. Many definitions of this role exist amongst countries, organisations, and the general public and media. A prison or correctional officer denotes an individual granted official authority within the specific domain of a prison environment, to supervise and manage prisoners (individuals held more often than not against their will in forfeit of their freedom as decreed to be so by a Court of Law). From here on, in this thesis the umbrella term of prison

officers (PO's) will be used for ease of simplicity to define such personnel (Prison Officer is the official title used within the UK prison system). PO's for the most part play the more front-line work role in prison establishments and predominately have the highest amount of occupational contact with prisoners (Denhof & Spinaris, 2013; Obidoa, Reeves, Warren, Reisine & Cherniack, 2011; Spinaris et al., 2012; Stadnyk, 2003).

The closed nature of prison work has traditionally shielded prison personnel from public view. Prison work has sometimes been perceived as 'dirty work' in the sense that it is undesirable due to a number of factors and perceptions such as interaction with marginalised populations, work that requires dealing with poor or dangerous conditions and that maybe perceived to be morally questionable by some (Ashforth & Kreiner, 1999; Tracy, 2004; Tracy & Scott, 2006). Prison work often also receives little occupational prestige and status associated with it even within the criminal justice community (Maghan & Mcleish-Blackwell, 1991; Tracy, 2004). The prison environment is unique and unlike any other, with the exception of psychiatric institutions and other secure types of confinement. More recently such environments have granted access to the public through the media, documentary makers and researchers, but still remains poorly understood. Within the US, Canada, UK and other similar developed countries the prison environment has undergone several varied changes over the last 30 to 40 years. The traditional role of prisons was to protect society from convicted individuals. However, in recent years there has been a shift toward a more focused service-based organisation tasked increasingly with the rehabilitation and resettlement of offenders. Inevitably such contrasting and ideological changes have resulted in ambiguity, upheaval and conflict within prison organisations.

The role of PO's in particular has changed significantly (Liebling, 2006; Rostaing, 1997). The dual purpose of providing secure confinement and rehabilitation has made the PO's role more complex. PO's must successively maintain control and discipline amongst prisoners, facilitate rehabilitation and provide a service to clientele. Changes have also affected the hiring polices of many prison organisations, with an increase of female PO's (Rostaing, 1997). Likewise, more and more professional, non - PO employees have entered the scene (social workers, psychologists, etc.; Lhuilier & Aymard, 1997). PO's face difficult work conditions particularly in respect to the ambiguities of the modern role (Kommer, 1993) increases in specialised personnel and elimination of traditional tasks afforded to PO's which have been redirected has limited the authority needed to perform the role (Jauvin, Vézina, Dussault, Bourbonnais, & April, 2003). This coupled with diminished staffing levels, increases in

violence, self-harm and suicide rates (Ministry of Justice, 2018) increasing numbers of female staff to male staff ratios and widescale hiring of younger PO's s to replace experienced PO's (Jauvin et al., 2003) organisational shifts to a rehabilitative framework and pressures from central governments to provide a more cost effective public service, have all had major repercussions on absenteeism rates, turnover, retention, and stress in the workplace and the deterioration of social relationships among members of the organization, as well as staff and prisoner relationships. Of concern is the potential exacerbation of adverse psychological outcomes amongst prison personnel in response to such rapid and potentially misdirected implementations.

1.6.4.1 Occupational and Organisational Stress in Prison Personnel

Members of professions that require a significant interaction with varieties of people, in the execution of their duties, such as police and prison officers may demonstrate high levels of chronic stress. Stress has multiple definitions throughout the literature, according to Matteson & Ivancevich (1987) all stress definitions can be categorised as a stimulus or response, stress that acts as a stimulus and has a negative effect is known as a stressor, role conflict, ambiguity, and overload being such examples (Lambert & Paoline, 2008). Job stress has been defined as the response by an individual to such stressors. Within the prison literature an individual's job stress is usually defined as feelings of tension, anxiety, frustration, worry, emotional exhaustion, and distress. In this conceptualisation job stress is stress that is a response to the stimulus of stressors (Griffin et al., 2010). In distinguishing job stress amongst prison personnel, it is important to recognise the distinction between occupational and organisational stress. Occupational stressors are a consequence of working with the management and incarceration of prison populations and there are distinct similarities within the occupational role regardless of country, these stressors include but are not limited to, risk of assaults, intimidation, physical and psychological abuse for example. This is in contrast to organisational stressors that may occur as a consequence of the cultural, organizational and political factors that differentiate the detainment and management of prisoners in different countries.

Within the prison personnel research literature, occupational and organisational Stress has been fairly well studied within certain domains. Research findings from several countries suggest that working in a prison environment can be stressful (Johnson et al., 2005; Kinman et al., 2014). UK research (Johnson et al., 2005) found that Prison Officers reported poorer physical and psychological health and lower job satisfaction than the majority of the 26

occupational groups included. Denhof and Spinaris (2016) review of US corrections literature found that prison staff and particularly prison officers are often exposed, directly and indirectly, to incidents involving violence, injury and sometimes death (Konda, Tiesman, Reichard, & Hartley, 2013; Schlosser, Safran, & Sbarratta, 2010; Spinaris, Denhof & Kellaway, 2012; as cited in Denhof & Spinaris, 2016) reported examples included being physically assaulted, witnessing attempted or completed suicides, being threatened with physical harm, witnessing assaults, riots, arson, or learning disturbing details about an offender's crimes on a recurrent basis over their careers. Spinaris et al. (2012) reported that United States corrections professionals experienced an average of 28 exposures to violence, injury and death events over a five-year period involving events of five different types. Violence and aggression from prisoners have been highlighted as a particular source of stress for PO's. Labour statistics from the USA indicate that correctional officers have a considerably greater risk of non-fatal 'on-the-job' injuries than any other occupational group (Kunst, 2011). US PO's in 2014, sustained 53 work-related intentional injuries by another person per 10,000 hours worked or equal to an average of 53 injuries per individual for every 5 years of service. Prisons in England and Wales reported record figures of operational incidents in 2016 (Ministry of Justice, Safety in Custody statistics, 2017). In the US from 1999 to 2008, there were 113 confirmed work-related fatalities among PO's (Konda et al., 2013).

Studies of prison staff have highlighted a range of occupational and organisational working conditions that are particularly stressful (Kunst, 2011). Studies identifying the working conditions that are most stressful concluded that the organizational structure and climate, rather than factors intrinsic to the job role, posed the greatest risk to wellbeing (Finney, Stergiopoulos, Hensel, Bonato & Dewa, 2013). Reviews of 43 official investigations in nine European and American countries revealed high work constraints amongst PO's involving, role ambiguity (Dollard & Winefield, 1994; Triplett, Mullings, & Scarborough, 1996), role conflicts (Dollard & Winefield, 1994; Grossi & Berg, 1991; Triplett et al., 1996; Whitehead & Lindquist, 1986), lack of participation in decision making (Lindquist & Whitehead, 1986), low social support at work, management problems, job pressure, low decision latitude (Dollard & Winefield, 1994), limited promotional prospects, overtime fulfilment demands (Triplett et al., 1996), health and safety concerns (Grossi & Berg, 1991; Grossi, Keil, & Vito, 1996; Triplett et al., 1996; Triplett, Mullings, & Scarborough, 1999) and constantly working with the same inmates (Triplett et al., 1996, 1999) shift schedules, position held, and lack of experience (Dollard & Winefield, 1994).

Studies on PO's in Canada show they are more likely to present signs of psychological distress linked with work when they were exposed to high psychological demands, low decision latitude, job strain and poor social support from superiors and colleagues (Bourbonnais, Jauvin, Dussault, & Vézina, 2007). Amongst PO's in Peru greater levels of experience have been associated with greater role conflict, role ambiguity, job dissatisfaction, burnout, along with positive and negative modifications to family and work relationships (Clemente, Reig-Botella, & Coloma, 2015). Research in Taiwan, indicates that younger PO's report higher levels of fear of victimisation by prisoners, fear of victimisation also increased with the security level of the prison, overall higher levels of perceptions of stress were reported along with lower levels of workplace safety (Lai, Wang, & Kellar, 2012). Research in South Korea indicates high job stress and low psychosocial wellbeing amongst PO's (Koo & Kim, 2006).

Several negative outcomes for PO'S are related to stress, such as increased levels of turnover and burnout (Garner, Knight, & Simpson, 2007; Griffin et al., 2010; Keinan & Malach-Pines, 2007), decreased levels of organizational commitment and job satisfaction (Hogan, Lambert, Jenkins, & Hall, 2009; Lambert & Paoline, 2008), as well as adverse psychological symptomology (Cheek & Miller, 1983; Kauffman, 1988). As well as stress perpetuated by occupational roles and organisational policies, external influences have also been shown to have an impact on PO's wellbeing, the negative portrayal in the media of PO's can erode support from and status within the larger community, which, in turn, may contribute to PO's stress (Keinan & Malach-Pines, 2007; Vickovic, Griffin, & Fradella, 2013). Historical usages of prison systems, such as those in ex-communist countries, where prisons were often employed against the people, have compounded stress that PO's face from the general public viewing them in a negative light as they make the transition to the post-communist era in the application of the prison system as a service (Szczepanik, Simpson, & Siebert, 2014). The concept of 'care' is now associated with the role of many prisons particularly in western countries, and is central to staff and prisoner relationships, in direct opposition to their original conceptualisation which was to incarcerate and punish convicted criminals and keep them from mainstream society. The emphasis of a PO's work now is finely balanced between the polar of providing support and maintaining authority and control. The PO has now had to adapt to this new role furthermore, the number of mental health issues and psychiatric illness continues to rise amongst global prison populations giving rise to the ambiguity of the modern PO's and traditional PO's roles and concepts (Tait, 2011). The tension between custody and care is not

always problematic, the maintenance of order is of mutual interest to PO's and prisoner's alike, safer, stable, and predicative environments can alleviate stress between the two parties. Indeed the balance of power has to be carefully sought and maintained, if the equilibrium fluctuates this is often when conflicts and issues arise (Liebling et al., 2005; Crewe, Liebling, & Hulley, 2011).

Staff turnover rates, particularly amongst PO's are problematic in the realm of prison facilities (Tipton, 2002). Half of US facilities have reported difficulties recruiting and retaining staff (Sumter, 2008) with turnover estimates of 15 to 25% (Minor, Wells, Angel, & Matz, 2011). The prison service of England & Wales, reported a loss of 596 PO's in 2016 and 1244 in 2018 an increase of 109%, 1 in 16 Officers left service in 2018, with 1 in 100 leaving in 2010, 6,000 years of Officer experience were lost in 2017, with reports that 1 in 3 Officers having less than 3 years' experience in 2018 in comparison to 1 in 8 in 2010 (Ministry of Justice, 2018). Furthermore, 33% of officers who left service in 2018 had less than 12 months experience in comparison to just 7% in 2010. A high rate of sickness absence has also been recorded in the prison service of England & Wales, in the twelve-month period to March 2014, 40,000 working days were lost (equal to 2.6 days per individual prison officer) over a quarter of this absence was due to job-related stress, anxiety and depression, equal to 0.6 days per individual prison officer (Ministry of Justice, 2014) furthermore, rates between individual 'cases' may vary greatly. Failures to address turnover issues and subsequent understaffing can lead to the compromising of safety for staff and prisoners (Higgins, Tewksbury, & Denney, 2013). Turnover as well as the cost associations present other problematic issues the loss of experience and skills and expertise amongst staff take time to re-establish, lack of experienced mentors leads to an influx of inexperienced staff compromising vital relationships between staff and prisoners which help to ensure stability (Minor et al., 2011). Other areas affected are the ability to maintain prison regimes with particular emphasis on 'time out of cells' and attendance of work for prisoners, creating further tensions between staff and prisoners (Griffin, Hogan, & Lambert, 2014). Reliance of overtime to compensate for low staffing levels can result in, sleep deprivation and fatigue leading to cognitive impairment, lack of vigilance, decreased motor skills, and decreased morale (Higgins et al., 2013). The effect of staff perceptions of safety is critical, staff members who believe their safety to be at risk while at work have been found to be more likely to express a desire to seek alternative employment or take sickness leave, decreasing staff numbers even further (Tipton, 2002).

The experience of work-related stress has been found to be more strongly correlated with anxiety and depression amongst Australian PO's than to experiences of critical incidents alone (Gehrke, 2004) and corresponds with the police literature on psychological stress where organisational stressors rather than occupational stressors demonstrate the strongest relationships with adverse psychological outcomes (Brough, 2004). Fear of prisoners amongst PO's, both as a result of emotional preconceptions and coupled with the real risk of violent victimisation by prisoners has been shown to be a causation of stress amongst PO's (Gordon & Baker, 2017). Female PO's report greater perceived fear of victimisation by prisoners and overall feelings of reduced safety as opposed to male PO's (Garcia, 2008; Gordon & Moriarty, 2007; Gordon, Proulx, & Grant, 2013). Studies that have examined fear, have considered it as a causational factor as opposed to a predictive outcome (Stichman & Gordon, 2014; Taxman & Gordon, 2009). PO's fear and perceived danger has been linked to increased stress and negative job satisfaction in many studies (Dowden & Tellier, 2004; Lambert, Cluse-Tolar, & Hogan, 2007). Amongst the factors that have been associated with PO's stress the fear of violence is highly correlated (Schaufeli & Peeters, 2000). Furthermore, stress amongst PO's has also been linked to avoidance, mental disorder, negative attitude, and job burnout (Schaufeli & Peeters, 2000). As such, fear is a significant factor in a variety of negative outcomes for PO's. Research has shown that female and male officers do not differ in their levels of responsiveness to aggressive prisoners, although female PO's report higher job related stress overall it is not associated with likelihood of aggressive responses (Tewksbury & Collins, 2006).

Harvey (2014) found a significant negative correlation between perceived physical health and psychological distress in UK PO's, there was some evidence that social support from the prison organisation moderated this relationship whereas social support from significant others did not. Rembert & Henderson (2014) examined excessive use of force in PO's and found correlations with retaliatory violence, negative attitudes, and failure to listen to prisoner's concerns, inadequate training, and an inability to decipher reliable threat cues. PO's also come into contact daily with ex intravenous drug users who may carry the HIV infection, prevalence rates of 2.5% (50,000 prisoners) exist in US state prisons (Vlahov et al., 1991; Smith et al., 1991). Fear of infection has been found to be a significant stress predictor amongst PO's (McIntyre, Marquart, & Brewer, 1999). Comparatively low levels of stress however have been found in Canadian PO's working in the northern provinces, lower levels of

stress were attributed to prisons that were not overcrowded, high staff numbers, lower prisoner numbers and low sickness levels (Pollak & Sigler, 1998).

Crawley (2004) has identified the significant problems UK PO's have in detaching themselves from their role when they are off duty and the impact it has on their family lives. Displacement of stress and anger is a reported common feature amongst police officers (Klein & Klein, 2000; Gershon, 2000) and has been studied in PO's also (Valentine, Oehme, & Martin, 2012). Both family / work conflict (family responsibilities conflicting with work) and work / family conflict (overtime demands, inability to switch off from work) are significantly related to both job stress and job satisfaction amongst PO's with lower levels of family and supervisory support associated with job stress (Armstrong, Atkin-Plunk, & Wells, 2015). Furthermore, the demands of PO's work and family conflict are significantly correlated with high levels of divorce rates (Lambert & Paoline, 2008).

Organisational structure (arrangement, management and operationalisation) of individual prisons have been found to compound job stress amongst PO's. Low levels of organisational forms of structure pertaining to centralisation, instrumental communication, integration, and legitimacy were all found to be significant predictors of job stress (Lambert, Allen, & Hogan, 2006). The experiencing of victimisation, higher levels of prison violence and greater job demands are related to higher stress amongst PO's, whereas higher perceived control over prisoners and support from co-workers are related to lower levels of stress (Steiner & Wooldredge, 2015). Some research has focused on the environmental factors, such as overcrowding, inadequate sanitation, dilapidated accommodation and poor architectural design within prisons that contribute to stress and wellbeing (Bierie, 2012). Such factors can impact stress by increased job demand, decreased job control and lower opportunities for social support and reduction in workplace safety. Prisons in the Southern United States are reported to be among the most underfunded, understaffed, and crowded in the US, with occupancy rates between 154% and 206% of capacity. PO's within these facilities reported high levels of stress and impaired job performance due to understaffing and overwork. Officers at the most crowded prisons were the most stressed and most fearful of inmates (Martin, Lichtenstein, Jenkot, & Forde, 2012). Prison overcrowding is prevalent within the prison system of England & Wales, 68% of prisons house more prisoners than their usable "certified normal accommodation", 80 of 117 prisons have been found to breach this limit, with some holding more than 50% over the certified population levels (Ministry of Justice, 2017). Overcrowding within a prison generates higher workloads for PO's, individual workloads can heighten individually perceived

levels of stress (Dollard & Winefield, 1998) however overcrowding may independently contribute to stress amongst PO's because of the reduced ratios of staff to prisoner numbers (Finn, 2000). Perception of less control may increase autonomy use and reduce legitimate authority levels. Overcrowding may also inhibit the PO's capabilities to effectively manage the prisoner population (Steiner & Wooldredge, 2009). Loss of familiarity amongst officers and prisoners can increase uncertainty amongst officers and reduce opportunities for the development of supportive relationships (Liebling, 2004). As a consequence of reduced officer numbers and increasing prisoner numbers, violent incidents may ensue between prisoners and staff and prisoners', perpetuating stress levels, as well as diminishing perceptions of workplace safety (Spector et al., 2007). Violent prisons erode confidence in prisoners for officers to maintain a controlled and safe environment and diminish relationships, encouraging further rule breaking and the policing of their own environment, furthermore loss of stability enables gangs or individual prisoners engaged in illicit activities to exploit the breakdown in stability, further increasing violence, lack of safety, bullying, drug usage, self-harm and suicide amongst prisoners (Kirk & Papachristos, 2011).

Security levels of prisons and the typology of prisoners housed in them have also been associated with varying stress levels amongst PO's, lower security prisons typically house lower risk prisoners resulting in less stressful environments (Steiner & Wooldredge, 2009). Life sentenced prisoners are typically housed in maximum security conditions but may be more stable in comparison to short term prisoners housed in large overcrowded and busy court serving gaols. Prisons that house female offenders have lower incidences of violence but high levels of self-harming behaviour, whereas prisons that house young offenders are typically problematic with large incidences of assaults on staff and violence between prisoners (Cullen et al., 1985) and this still appears consistent with current statistics (Ministry of Justice, 2018).

PO's work involves professionally encountering all kinds of prisoners, no matter how resistant they are or regardless of the crimes they have committed. Studies on Swedish PO's show that in managing their own emotional strain, whilst managing prisoners varying emotional states different strategies of self-management they employ may cause different types of emotional strain, 'surface acting' (trying to remain emotionally detached) may lead to the cynicism and alienation of prisoners whereas 'deep acting' (becoming emotionally attached) may lead to increased stress and exhaustion (Nylander, Lindberg, & Bruhn, 2011). Costello, Bogue, Sarma, & McGuire, (2015) found chronic pain prevalence in a significant sample of Irish PO's to be associated with both physical and psychological impairment, and majorly

prevalent in the prison work environment. An independent UK research study (Kinman et al., 2014) commissioned by the Prison Officers Association (POA; the trade union body representing prison officers and secure psychiatric workers) found that the employing bodies were not meeting the minimum standards recommended by the UK Health and Safety Executive (HSE) for the management of employees' work-related wellbeing. Levels of wellbeing were lower than those found in the Police, Fire and Ambulance services. Participants reported that they experienced verbal abuse from prisoners regularly. Half received verbal threats and were subjected to intimidation from prisoners regularly. Thirty percent had been physically assaulted by a prisoner, with most assaults occurring during the last four years. These respondents were found to have higher psychological distress and emotional exhaustion and to have experienced problems with anxiety and insomnia. More than thirty percent had been diagnosed with a stress-related illness.

Research on gender variables amongst PO's revealed that selected workplace variables had statistically similar associations with work stress and job satisfaction for women and men, except for role problems (aggression and confrontation from prisoners), which had a negative significant relationship on the job satisfaction of female PO's only (Lambert, Kim, Keena, & Cheeseman, 2017). Unique difficulties for female PO's have been found, reporting feelings of isolation in their roles and a lack of support by supervisors, in addition to difficulties with shift work and family commitments (Cheeseman, 2010). PO's perceptions of prisoners and relation to job stress studies have showed, low supervisor support and perceptions of danger are associated with higher levels of job stress, officers who perceived inmates as being unfriendly and / or antisocial reported higher levels of stress (Misis, Kim, Cheeseman, Hogan, & Lambert, 2013). Historically prison work has generally been male orientated (barring the larger cohorts of female officers in female prisons). Women officers were first introduced into male prisons within the US in the last 40 years rising from less than 10% in the 1970's to 40% by 2010 (Tewksbury & Collins, 2006) similar figures prevail in UK prisons with the transition period occurring from 1990 to the present. The appropriateness of female officers working in male establishments has long been debated as have their abilities to perform the role as well as their male counterparts (Tewksbury, 1999). The prison environment has traditionally largely been overshadowed by a masculinised and machismo ethos, and just as this had implications for the acceptance of female officers so too has the acceptance of stress. Although long suspected and chronicled that prison work maybe stressful (Kauffman, 1988) and adverse psychosocial symptoms may be present amongst officers, the acceptance of it amongst officers and measured

research has been slow to occur. This was largely due to appearances of being perceived as weak to other colleagues, and self-perceptions of not being able to cope with prisoners or maintain control over them or even to admit fear. In this sense it was dually a concern of being ostracised from a cohesive group of colleagues for failing to adhere to the norms or expectations of the group which is integral to an officer's support network and ability to function in their role. In this way the officer may self-deny and self-suppress symptoms. Stress that was felt amongst officers was culturally dealt with through self-medicating behaviours, particularly alcohol use which has been shown to be prevalent amongst PO's (Kauffman, 1998; Cheeseman, 2010). Aside from this, organisationally managerial practice has remained unchanged and largely unresponsive to the effects of prison work, prison work in the UK was only recently formerly acknowledged as stressful (HM Prison Service, 1996). Employees who previously presented with stress were often viewed incapable of continuing with prison work and were regraded, dismissed or medically retired, research has supported the notions of 'management bullying' being a prevalent source of stress amongst officers (Crawley, 2004). Because of all these factors PO's have been resistant to declare problems with stress, coupled with the longstanding notions of self and group perceptions of masculinity and expectations that they will supress non-masculine emotions have often prevented officers seeking the help they need. With the inclusion of female officers into male prisons many female officers have also become adopting of masculine ethos's and recruited into these existing cultural attitudes, however whilst many women officers are aware of the need to present confidence and authority in their role they are more likely to share their feelings with colleagues, and in response male officers have reported the benefit of being able to express their feelings to female colleagues in a way they were previously unable to do (Crawley, 2004; Bennet, Crewe & Wahidin, 2008).

1.6.4.2 Burnout in Prison Personnel

An area that is of particular consequence and relevance to PO's are the effects of burnout (Maslach & Jackson, 1981). There is a body of research pertaining to burnout within the prison literature with research having been carried out predominately in US prisons. Systematic literature reviews (Lambert, Griffin, Hogan & Kelley, 2015) have identified large gaps within the literature and inconsistencies of measurement, however almost all the studies reviewed ranging from 1981-2014 indicated significant levels of burnout within PO's.

Job stress has in some studies been defined as the same as burnout, however burnout is conceptually different from stress (Keinan & Malach-Pines, 2007). Burnout generally develops as the result of prolonged chronic exposure to job stress (Maslach, 1982; Maslach & Jackson,

1984). Burnout takes a longer period of time to develop than job stress, however job stress has been shown to be one of the major causes of burnout (Garland, 2004). Amongst prison personnel empirical evidence supports the contention that job stress is associated with burnout (Garner et al., 2007; Keinan & Malach-Pines, 2007). Burnout is defined as 'a syndrome of emotional exhaustion and cynicism that occurs frequently among individuals who do people work of some kind' (Maslach & Jackson, 1981). Burnout is multidimensional in concept and is perpetuated by excessive strain and psychological exhaustion faced by an employee. The three factors involved in burnout, are emotional exhaustion, involving a feeling of being emotionally drained, fatigued and overstretched, depersonalisation, involving the impersonal treatment of others, callous feelings towards them, and holding of the view of them as impersonal objects, reduced sense of personal accomplishment, characterised by feelings of ineffectiveness, having no positive impact, and not being effective in the dealing with others (Maslach & Jackson, 1981, 1984). Occupational burnout is not recognised as a distinct disorder within the DSM-5 (APA, 2013), but is included in the ICD-10 (WHO, 1992) listed under problems related to life management difficulty.

The strain of intense emotionally supportive work, that occurs overtime in care occupations (Grunfield et al, 2000; Abedi-Gilavandi et al., 2019) may also be particularly problematic for PO's, in respect to the fact that the conceptualisation of prison systems has changed toward a service-based system and ethos, focused more on care and rehabilitation of offenders as opposed to incarceration. Burnout predominately occurs over a period of time, with a gradual loss of caring by employees about the people they work with as they are simply unable to sustain the pressure, personal care required and commitment that is the essence of their jobs (Maslach, 1978). Modern prison systems deal with a varying typology of offenders imprisoned in them, with offenders who are emotionally vulnerable, substance dependent, personality disordered, traumatically exposed, have complex past histories, high psychopathy levels, high psychological illness and high levels of self-harming and suicidal ideation (McDermott, 2017; Boduszek et al., 2018). Further to this organisational stressors as previously reviewed are postulated to be major contributors to job burnout also (Maslach & Jackson, 1981; Cherniss, 1980). Difficult and stressful work environments may lead to staff burnout, coupled with the combination of unique organisational and occupational stressors within the prison environment, risk of burnout amongst prison personnel has been shown to be greater than other occupations (Keinan & Maslach-Pines, 2007).

Left untreated burnout is a deleterious psychological condition and it has also been associated with physical symptomology including, chronic pain manifestations, stomach ailments, insomnia, and fatigue and lethargy (Elman & Dowd, 1997; Maslach, 1982). Psychologically sufferers report, anger, depression, helplessness, reduced sympathy, and a loss of self-esteem and motivation (Maslach, 1982). Burnout has also been shown to impact individual behaviour by increasing staff withdrawal, unnecessary risk taking, negative attitudes, oppositional posturing, and alcohol and drug abuse (Maslach, 1981, 1982; Freudenberger, 1974; Corrigan et al., 1998). Within the work environment burnout has a negative impact on the individual, employees, prisoners and the organisation, negatively impacting interactions with colleagues and prisoners (Garland, 2002). Burned out PO's often may withdraw, losing the confidence and self-esteem which are necessary to handle interactions with prisoners. Staff may depersonalise because of burnout leading to callous attitudes and manners in their dealing with prisoners, as well as becoming emotionally numb to their problems as a result of the emotional exhaustion that entails (Garner et al., 2007). Work performance may also become depleted and staff absenteeism levels rise, leading to the burdening of co-workers (Garner et al., 2007) as well as then potentially exacerbating levels further throughout the organisation (Maslach et al., 2001) turnover levels may also subsequently increase (Neveu, 2007).

Much of the research surrounding prison personnel burnout has centred on its possible antecedents, age has been found to have an inverse relationship with all three dimensions of burnout (Garner et al., 2007). Male PO's have reported higher levels of depersonalisation and reduced sense of accomplishment whereas female officers have reported higher levels of personal accomplishment, but both genders did not differ on levels of emotional exhaustion (Carlson, Anson & Thomas, 2003). Higher contact with prisoners has been associated with higher levels of sense of accomplishment (Whitehead & Lindquist, 1986). PO's that are primarily involved in treatment positions have reported higher levels of burnout (Carlson & Thomas, 2006). However, a large majority of the research on prison personnel suggest organisational influences as opposed to individual variables exert a greater influence on work experiences (Garner et al., 2007). Amongst PO's job satisfaction has been found to have a negative association with emotional exhaustion, depersonalization, and a sense of reduced accomplishment at work. In contrast job stress has been shown to have a positive association with depersonalization and emotional exhaustion (Griffin et al., 2010). Depersonalization and

emotional exhaustion have also been associated with increased turnover and high staff sickness rates (Lambert, Hogan & Altheimer, 2010).

Garland, Lambert, Hogan, Kim, & Kelley, (2014) found that affective commitment (loyalty to the organisation) had a negative association with emotional exhaustion, depersonalization, and feelings of reduced accomplishment, while continuance commitment (personal reasoning for continued employment) had a positive relationship with all three dimensions of burnout. Suggesting that individual employees committed to an employer and its inherent functions and objectives were less susceptible to the effects of burnout in comparison to individuals that continued with their occupation in order to simply support themselves and their families financially. Controlled variables of tenure (those who have held position the longest in an organisation) had a positive association with emotional exhaustion, age had a negative relationship with depersonalization, and average daily contact with prisoners had a positive association with feelings of reduced accomplishment, suggesting that individuals who have higher levels of occupational experience are more prone to the effects of burnout. This is supported by previous research Lambert, Kelley & Hogan (2013) found a negative relationship between burnout and affective commitment, and a positive relationship between burnout and continuance commitment.

Studies have investigated, work stressors, coping styles, and work-related social support in relation to PO's burnout. Cieslak, Korczynska, Strelau & Kaczmarek (2008) found emotion-oriented coping to be positively related to emotional exhaustion, and negatively related to personal accomplishment. Task-oriented coping to be positively related to personal accomplishment. Social support from work was found to be negatively related to emotional exhaustion. The effects of work stressors on burnout were found to be mediated by work-related social support and by emotion-oriented coping. Additionally, some of the mediating effects were moderated by endurance. Work-related social support was negatively related to depersonalization but only among participants with strong endurance. High level of work stressors predicted high emotion-oriented coping but only among individuals with weak endurance. Morgan, Van Haveren & Pearson (2002) found older and more experienced officers reported increased levels of personal accomplishment, whereas less experienced officers reported increased levels of depersonalization and emotional exhaustion and decreased levels of personal accomplishment. Gender comparisons indicated that female officers were less likely to respond impersonally to prisoners than their male counterparts. Studies into perceptions of harassment have shown that women officers report significantly more

harassment than males within the prison environment but were again less likely to depersonalise prisoners than male officers. For female officer's harassment was a significant predictor in burnout, organisational commitment and perceived stress, whereas only harassment was significant for male officers in relation to perceived stress, however both male and female officers were found not to differentiate on levels of burnout (Savicki, Cooley & Gjesvold, 2003).

Social support in the form of co-workers, managers, supervisors, and family and friends, has been found to influence the different dimensions of burnout, Lambert, Altheimer & Hogan (2010) found all dimensions of job burnout to be influenced by one type of social support but that the effects of some types of social support were unique to specific dimensions of job burnout, and none of the types combined to influence any dimension of job burnout in a uniform manner, therefore suggesting the need to address the differing aspects of burnout through specific social support. Conversely Dignam, Barrera & West (1986) found no support for either the direct or buffering models of workplace social support, rather that the data was consistent with the indirect model of workplace social support in the form of diminished role ambiguity. Lambert, Hogan, Barton-Bellessa & Jiang, (2012) further studied the effects of trust in supervisors and management in relation to burnout and found that trust in supervisors and management can lead to decreased burnout, and a lack of trust can increase the level of burnout. Job autonomy and job variety have been shown to have a negative association with emotional exhaustion and perceived ineffectiveness, along with, supervision consideration, job autonomy, and job variety on effects of depersonalization (Griffin, Hogan & Lambert, 2012).

Research in Bulgaria (Harizanova & Tarnovska, 2013) has found a high prevalence of burnout amongst PO's (75%), furthermore younger and more inexperienced staff were found to have the highest levels of burnout. Research in China (Hu et al., 2015) examined job burnout on three subscales, emotional exhaustion, cynicism, and professional efficacy. The strongest associations were found between occupational stressors and burnout. Imbalances between extended efforts and rewards caused negative effects and therefore predicted burnout, particularly emotional exhaustion and cynicism, a strong over commitment to work was also associated with emotional exhaustion and personal effectiveness also. Lambert et al., (2010) have focused on organisational perceptions of justice and found both distributive justice (the perceptions of fairness of outcomes for employees within an organization) and procedural justice (the processes that organizations use to make salient outcome decisions) had inverse

associations with burnout and turnover intent, while procedural justice had positive associations with life satisfaction.

Gould, Watson, Price, & Valliant (2013) investigated the mediating effects of coping strategies employed by PO's, results indicated that within the study sample there were higher rates of emotional exhaustion and depersonalisation. Emotion focused, and problem focused coping strategies were not found to significantly mediate the effects of burnout. Female PO's were found to employ a wider range of coping strategies in situations of stress. PO's with greater experience reported higher levels of emotional exhaustion, but no relationship was found between length of experience and depersonalisation. In a UK based study (Xanthakis, 2009) it was found that PO's reported moderate levels of burnout, with attitudes towards prisoners and tenure on the job being the most significant predictors of staff with the highest burnout levels. Lambert et al., (2015) found all the variables assessed in relation to burnout were affected by length of service in PO's, greater experience led to greater role conflict, role ambiguity, job dissatisfaction, burnout, and modifications in family and work relationships both positive and negative. Overall research on the antecedents of job burnout among prison personnel are more common than research on the possible consequences or outcomes of job burnout. The majority of studies have focused on staff working in a variety of institutional positions, with fewer studies focusing exclusively on the subgroup of PO's, and even fewer focusing on different subgroups. Furthermore, despite the empirical emphasis on the antecedents of burnout, there has been almost no research on effective interventions designed to deal with prison personnel burnout therefore, significant gaps remain in the literature (Lambert et al., 2015).

1.6.4.3 Trauma Exposure, PTSD, Depression and Anxiety in Prison Personnel

As highlighted in the preceding sections, during the course of performing their duties, prison staff, and particularly prison officers are often exposed, directly and indirectly, to incidents involving violence, injury and sometimes death (Konda et al., 2013; Schlosser et al., 2010; Spinaris et al., 2012 as cited in Denhof & Spinaris, 2016). Common reported examples include being physically assaulted, witnessing attempted or completed suicides, being threatened with physical harm, witnessing assaults, riots, or arson, or learning disturbing details about an offenders crimes on a fairly recurrent basis over their careers (Denhof & Spinaris, 2016), Spinaris et al. (2012) reported that United States corrections professionals experienced an average of 28 exposures to violence, injury and death events over a five year period

involving events of five different types. Violence and aggression from prisoners have been highlighted as a problematic source of stress for prison officers (Kunst, 2011).

Reports from prisons in England and Wales (Ministry of Justice, 2017) suggest that self-inflicted deaths amongst inmates had increased 32% from the previous year and doubled since 2012. Self-harm incidents had increased 23%, prisoner on prisoner assaults increased 28% and serious assaults (classified on severity of injury) by 30%. Crucially assaults on staff had increased 40% with 761 classified as serious and trebled since 2012. All of these figures were reported to be the highest on record (Ministry of Justice, 2017) in UK prisons. Further reports released by the Ministry of Justice (June 2018), showed that these figures had further increased. Self-harm incidents rising by 16%, prisoner on prisoner assaults rising by 16% and serious assaults (classified on severity of injury) by 9%. Assaults on staff had further increased by 26% with serious assaults increasing by 11% (Ministry of Justice, 2018). US figures from 1999 to 2008, showed 113 confirmed work-related fatalities among PO's (Konda et al., 2013), 28 of these were homicides. Of non-fatal work-related injuries due to assaults 37% were found to occur while restraining or being assaulted by a prisoner.

Whilst other similar occupational roles have received greater research attention than prison work it is often the case that PO's are exposed to similar work-related traumatic events as police officers, firefighters and military personnel (Perrin et al., 2007; Corneil et al., 1999; Fulton et al., 2015; Gates et al., 2012 as cited in Denhof & Spinaris, 2016). Holmes and MacInnes (2003) reported that PO's believe they lack sufficient training to deal with the traumatic situations that are sometimes encountered, and this exacerbates the stress they experience further. Direct trauma exposure has been found to cause adverse psychological effects amongst PO's within the US prison system (Bureau of Labor Statistics, 2015; Denhof & Spinaris, 2013; Denhof et al., 2014; Konda et al., 2013; Spinaris et al., 2012; Stadnyk, 2003).

Given the findings of prison personnel's high levels of potential exposure to traumatic events it reasons that PO's could face similarly higher rates of PTSD and / or depression, anxiety. Studies support a link between exposure to violence, injury and death and PO's mental and physical health (Denhof & Spinaris, 2013; Spinaris et al., 2012; Stadnyk, 2003), furthermore, higher exposure is correlated with increased mental health symptomology.

Research on associations between grades and types of prison personnel have found PO's to be significantly more vulnerable than other types of personnel, as PO's for the most part have the highest amount of daily contact with prisoners (Denhof & Spinaris, 2013; Obidoa,

Reeves, Warren, Reisine & Cherniack, 2011; Spinaris et al., 2012; Stadnyk, 2003). Studies have found that a high percentage of officers demonstrate moderate to severe levels of depression, stress, or anxiety disorder symptoms at a higher rate than prison personnel with different job roles (Denhof & Spinaris, 2013). In severe cases, full criteria has been met for major depressive disorder (Obidoa et al., 2011; Denhof & Spinaris, 2013; Samak, 2003), PTSD (Spinaris et al., 2012; Stadnyk, 2003), or comorbid conditions (Denhof & Spinaris, 2013). Evidence of negative effects upon physical health, such as high blood pressure, digestive disorders, sleep difficulties, and memory impairment, have also been found (Denhof & Spinaris, 2013; Morse, Dussetschleger, Warren, & Cherniack, 2011; Spinaris et al., 2012).

Whilst negative health effects have been shown to be correlated with trauma exposure in prison environments, Denhof and Spinaris (2013) have found the presence of comorbid depression and PTSD to be particularly problematic in comparison to either depression or PTSD alone. Spinaris et al. (2012) found a prevalence rate of 27% within a sample of $N = 3599$ for PTSD amongst US, PO's, male officers and those involved in security and custody settings had significantly higher PTSD rates than female officers and non-security and custody personnel 31% versus 22% and 34% versus 23% respectively. PTSD rated participants reported higher exposure to workplace violence, injury, and death, higher levels of depression, anxiety, and stress, higher absenteeism, health services use, health conditions, and substance use, and lower levels of pro-health behaviours, life functioning, and life satisfaction.

Denhof & Spinaris (2013) further reported prevalence rates of PTSD amongst PO's far in excess of the US general population rates. A number of scales were used to measure PTSD, depression, anxiety and stress and correlations with witnessing and experiencing workplace violence, injury and death in a large sample ($N = 3599$) of US, PO's. Comorbid PTSD / depression demonstrated a positive correlation on a number of variables reflecting health and functioning. Depression rates of 28.7% and 22.1% were reported for male and female officers respectively. Security staff reported 31% and non-security staff 22.1%. Higher rates of depression were found for those who had been exposed to at least one traumatic event involving, violence, injury, or death 27.6% as opposed to those who hadn't been exposed of 13%. Male officers with PTSD were found to have a prevalence of 30.5% as opposed to female officers with 21.7%. With those who had been exposed to at least one traumatic event involving, violence, injury, or death 29.1% as opposed to those who hadn't been exposed of 9.3%. Amongst the sample of those who reported significant depression, 67% were also found to have PTSD.

Denhof & Spinaris (2016) further assessment of Michigan based US correctional officers (N = 991) revealed 68.7% were exposed to moderate to extreme levels of traumatic incidents involving, violence, injury, or death and correlated significantly with PTSD and Depression. A 33.7% prevalence rate for PTSD was found. PO's working in higher security prisons had a significantly higher rate than those working in low security prisons, 39.3% and 28.8% respectively. PO's working in high security settings were found to have a 37% greater risk of PTSD than lower security settings. A 36.3% prevalence rate for Depression was found. Rates for high and low security subgroups were 41.8% and 31.5% respectively. PO's working in high security settings were found to have a 33% greater risk of depression than lower security settings. Comorbidity prevalence of PTSD and Depression was found to be 24.9%. Rates for high and low security subgroups were 30.7% and 19.3% respectively. The prevalence of suicide risk was also assessed and found to be 4.6%. Individuals working within high security settings were deemed to be 87% more likely to score within the high suicide risk category than individuals working within low security settings. Comparatively similar rates for all of these assessments were found for male and female officers. Significantly higher rates across all assessments were found for individuals who had more than 10 years length of service experience.

Research into French PO's (Boudoukha, Altintas, Rusinek, Fantini – Hauwel & Hautekeete (2013) have found high levels of PTSD, burnout, and stress. Violent interactions with prisoners led to experienced trauma of all types (PTSD, secondary, or vicarious trauma). Results also highlighted a PO's profile who is PTSD susceptible demonstrating high levels of emotional exhaustion, high levels of stress and high levels of depersonalization. Research within a therapeutic prison within the UK housing sex offenders and prisoners with severe personality disorders, revealed 95% of PO's presented as potential clinical cases for adverse psychological illness (Walker, Jackson, Egan, & Tonkin, 2015). UK based research on the impact on PO's following a 'death in custody' incident 3-7 months after the event found a 36.7% prevalence rate of PTSD. Avoidance, prior experience of suicide, and level of involvement in the incident were direct mediators of the impact of the event, whilst perceived control, emotional support, and problem-solving style had an indirect effect. Comparison analyses of PTSD vs non-PTSD groups showed that the only mediator for the PTSD group was prior experience, whereas for the non-PTSD group a range of variables were found to mediate the impact (Wright, Borrill, Teers, & Cassidy, 2006). The effects of such traumatic events on

prison staff in the UK such as 'deaths in custody' remains under researched (Snow & McHugh, 2002).

Research amongst PO's in Nigeria revealed a 6 and 12-month prevalence rate for generalised anxiety disorder and major depression of 2.3 and 4% respectively (Badru, Ogunlesi, Ogunwale, Abdulmalik & Yusuf, 2018). Stadnyk (2004) found a prevalence of PTSD of 26% in a group of prison workers employed in the Canadian province of Saskatchewan. Bogaerts & Van der Laan (2012) researched the interaction effects of workplace aggression and PTSD amongst Dutch prison workers and found a significant interaction effect between the type of violence experienced and those with type D personalities (which have been shown to exhibit high negative affectivity and are more likely exhibit victim behaviour and thus have greater potential for PTSD development). Furthermore, type D individuals who had been physically assaulted showed significant correlations with PTSD, and type D personality was found to have a strong main effect on PTSD. Although not directed toward a study of prisoner on staff violence and potential trauma, the study highlights another possible area of concern in the development of PTSD amongst prison personnel and of the effects on type D personality individuals employed within a prison environment.

Research on a large sample of PO's in China have revealed significant differences in levels of depression between frontline officers and non-frontline officers. Frontline officer's depressive symptoms were negatively associated with perceived organisational support, psychological capital, hope, resilience, and optimism (Liu, Hu, Wang, Sui, & Ma, 2013). Goldberg et al. (1996) found a prevalence of 24% of French PO's with depressive symptoms. Approximately 61.4 % of Chinese male PO's were found to have depressive symptoms (63.5 % in frontline POs and 57.3 % in non-frontline POs). Analyses showed that effort–reward ratio (individuals perceived to exhibit high commitment for low occupational reward), over commitment (increased effort and long hours worked), chronic disease, and threat perception were associated with depressive symptoms in frontline and non-frontline POs, whereas weekly work time (in the form of high levels of overtime) had an effect only in frontline POs (Sui et al., 2014). The findings suggest that within the cohort those exhibiting excess commitment intentionally via additional hours working or through individual work ethic were more susceptible to the effects of depression, particularly those individuals who had more personal contact with prisoners. Approximately one-third of the POs employed at two state prisons in the north-eastern U.S. reported serious psychological distress (Obidoa et al., 2011). Current research on a sample of Washington (US) based PO's ($N = 355$), has found a PTSD prevalence

rate of 19%, 1 in 5 of the sample, PTSD rates were higher among women, black employees, and employees with more than 10 years of experience. PTSD scores didn't differ based on where the employee worked, minimum versus maximum security facility, associated risk factors for higher PTSD scores as measured by the PCL-5 included higher exposure to critical incidents, and role ambiguity (James & Todak, 2018).

Suicide risk has also been studied amongst PO's, Stack & Tsoudis (1997) examined PO's suicide rates in the US and found that PO's risk of suicide was 39% higher than that of the rest of all other professions combined in the study. Denhof, Spinaris & Morton (2014) have defined organisational and operational stressors within US prison facilities. Organisational relating to the 'people' aspects of the work, interpersonal conflict, role problems, management and leadership, operational in relation to logistical issues such as high workloads, shift work etc. As well as these factors they also defined traumatic stressors in relation to the aspects of a PO's work that may involve exposure to incidents of violence, injury or death. These were further conceptualised to direct and indirect exposures, direct being the witnessing of or having it happen to oneself, and indirect defined as the learning about of such an incident.

Denhof et al., (2014) have defined the term 'corrections fatigue' stating PO's "are routinely exposed to multiple varieties of stressors concurrently in prison settings such as organizational, operational and traumatic the more narrowly defined and context-specific terms such as compassion fatigue, secondary traumatic stress, or vicarious trauma, by themselves do not encompass the broader spectrum of exposure and stressor types 'corrections fatigue' can be understood as a collection of negative and inter-related consequences upon the health and functioning of corrections professionals and the workplace culture as a whole due to exposure to traumatic, operational, and organizational stressors and their interacting consequences. Consequences or manifestations of corrections fatigue include negative personality changes, socially dysfunctional thinking/ideology, and forms of declined health and functioning."

In this sense it becomes apparent it is difficult to compartmentalise specific stressor related concepts as attributable solely to organisational or operational stressors alone without providing a measure of isolating the variables. It is also clear from the literature that PO's are susceptible to a wide array of adverse psychological outcomes because of the nature of their roles and the literature within this area particularly in respect to PTSD, anxiety and depression is limited and uncomprehensive in its adhesion. Therefore, in light of taking criticisms of previous research into account and the lack of clarity and disagreement surrounding trauma exposure and PTSD, depression, anxiety and comorbidity, it highlights the need for cohesive

research along with further development and clarification surrounding these areas within a prison environment in respect to prison personnel.

1.7 CONCLUSION OF THE LITERATURE

In consideration of the literature that has been presented in the preceding sections, prevalence of PTSD within the general population stands at 3.5% within the US (APA, 2013). Specifically, within the UK general population rates of 3.7% of men and 5.1% of women have been found (NHS, 2018). Consistent higher rates are recorded in females in comparison to males (Kessler et al., 1994) with females being twice as likely to develop the disorder as males. Females also appear to experience PTSD for longer durations than males. Increased risk for females may stem from increased likelihood of exposure to traumatic events, particularly domestic violence and interpersonal violence. Higher rates are also present in areas of armed conflict with combatants and civilians both affected. The highest rates of all appear to be among those individuals exposed to rape, military combat and captivity, ethnically or politically motivated genocide and internment, between 30-50% of these such individuals will develop PTSD (Bisson et al., 2015).

In consideration of disorders with significant association to PTSD, Acute Stress Disorder is prevalent in 20% of individuals exposed to traumatic events that do not include interpersonal injury with higher rates of 20-50% recorded if interpersonal injury is sustained. ASD is a significant factor for the development of PTSD with 50% of individuals who initially present with ASD going on to develop full PTSD (Creamer, o'Donnell & Pattison, 2004).

The evidence suggests that subthreshold PTSD may be higher than full PTSD depending on which of the five diagnostic rules are used (Mitchell et al., 2012). Older adults have been found to demonstrate higher rates of S-PTSD than full PTSD later in life suggesting a developed resilience to trauma exposure and development of PTSD symptomology but evidence to support this notion is so far contested and inconclusive (McLaughlin et al., 2015).

Again, prevalence for S- PTSD has been found to be higher in women than in men (Stein et al., 1997). Much like PTSD, S-PTSD has been shown to hold clinical relevance (e.g., Breslau et al., 2004; Pietrzak et al., 2011b, 2011c; Pietrzak et al., 2012; Schnurr et al., 2000; Stein et al., 1997) and is associated with significant impairment as well as psychiatric comorbidity (e.g., Fetzner et al., 2012; Pietrzak et al., 2011b, 2011c, 2012; Schnurr et al., 2000; von Känel et al., 2010; Yurgil et al., 2014).

Prevalence of Complex PTSD is much lower than PTSD although figures of between 0.6 and 1% have been found within the UK and US population respectively (Wolf et al., 2015).

Furthermore, 25 – 50% of individuals who present with PTSD also meet the criteria for C-PTSD (Wolf et al., 2015) although caution must be exercised interpretation of these figures as there is so far disparate consensus unlike PTSD of its diagnostic criteria, with limited recognition in the DSM-5 (APA, 2013), a separate classification in the ICD-11 (WHO, 2018) and contested literature. What is evident is that C-PTSD presents differently from PTSD in individuals and is thought to occur because of repetitive, prolonged and chronic trauma exposure that involves sustained abuse or abandonment by means of an interpersonal relationship with an uneven power dynamic (ICD-11; WHO, 2018). C-PTSD therefore occurs in individuals who are chronically trauma exposed to less catastrophic but more sustained incidents. Trauma inflicted in the form of sexual, emotional, physical abuse and neglect in childhood, sustained chronic intimate partner violence, victims of kidnapping and hostage situations, slavery and prisoners of war are some of the examples of trauma exposure evident in the history of individuals with C-PTSD. Individuals who have suffered trauma before the age of fourteen are more likely to develop C-PTSD as opposed to PTSD, particularly if the trauma has been inflicted by a caregiver (Roth et al., 1997), clinical populations (individuals with an established psychiatric care need) are also significantly more likely to present with C-PTSD as opposed to non-clinical populations (Brom et al., 1992).

In respect to Anxiety prevalence rates of 2.9% of adults in the US and 5% within the UK have been found for Generalised Anxiety Disorder. Like PTSD Females are twice as likely as males to experience GAD. Individuals who present with criteria for GAD are likely to meet or have met criteria for other anxiety disorders and unipolar depressive disorders (Gale & Millichamp, 2011).

Prevalence rates for Depression are more common, 7% in the US with similar rates of between 5 -10% being found in the UK for Major Depressive Disorder, three times the number of 18-29-year olds present with the disorder than individuals above 60 years of age. Like PTSD and Anxiety rates in Females are greater than the rates in males (APA, 2013). Rates for individuals with Persistent Depressive Disorder are slightly lower than MDD, 3-6% but are at higher risk for general psychiatric comorbidity (anxiety disorders and substance use disorders in particular) than individuals with MDD (Sansone & Sansone, 2009) largely due to the enduring and persistent nature of the disorder.

Within the literature evidence shows that Individuals with PTSD are also 80% more likely to present with symptoms that meet diagnostic criteria for at least one other mental disorder, particularly depression and anxiety (Brady et al., 2000; Brady, Brewerton & Lucerini,

2000; Helzer et al., 1987; Breslau et al., 1991; APA, 2013). Studies regarding the effects of military and civilian trauma exposure show PTSD rarely occurs in isolation in individuals (Kozari´c-Kovaci´c et al., 2001; Orsillo et al., 2002). However, extremely disparate rates for comorbidity have been found within studies ranging from, 21-94% with comorbid anxiety 39-97% with depression and 11-67% endorsing a triple comorbidity (Ginzburg et al., 2010). Breslau (2002) and O'Donnell et al. (2004) have attributed such wide ranging findings to the fact that firstly, depression and anxiety may increase the risk of developing PTSD; secondly PTSD may be causational in the development of anxiety and depression; thirdly the observed comorbidity may be attributed to an overlap of symptomology and fourthly, PTSD, anxiety and depression may share commonalities of risk factors but remain distinct disorders. However, such disparate findings can also be attributable to different methodological measurements, different samples and sampling methodology as well as inadequate and inappropriate research techniques. What is evident is that rates of triple comorbidity (PTSD, anxiety and depression) are higher than rates of PTSD by themselves or comorbid with depression or anxiety alone, particularly in severely trauma exposed individuals (Ginzburg et al., 2010).

Theoretical and developmental explanations of PTSD are centred around three predominant current theories, Emotional Processing Theory (EPT; Foa & Kozak, 1986), Dual Representation Theory (DRT; Brewin, Dalgleish & Joseph, 1996) and the Cognitive Model of PTSD (CM; Ehlers & Clark, 2000). All three theories display a degree of overlap, incorporating a wide range of findings on the importance of contributing factors to the development and maintenance of PTSD as well as its treatment. Where the three theories differ is how the trauma impacts on memory and processes and where the changes happen in memory, and how they relate to recovery. Memory disturbance and appraisal are accounted for as distinct aspects of PTSD in DRT and the CM in comparison to EPT. EPT relies on the conception of a single associative network in memory, in DRT trauma stimuli that is insufficiently processed to form ordinary autobiographical memories are stored in the two processing systems. In the CM the autobiographical memory system consists of higher order themes, personal time periods, and specific event related information. Poor incorporation of a traumatic memory into this autobiographical database leads to fragmented memory recollection and cue orientated intrusions.

The literature as well as the DSM-5 highlights three areas of risk factors surrounding the development of PTSD pre-traumatic, peritraumatic and post-traumatic. Pre-traumatic factors include, childhood emotional problems before the age of 6, and prior mental disorders.

Heightened risk is associated with lower socioeconomic status, lower educational attainment, prior trauma, childhood adversity, cultural characteristics, lower intelligence, minority racial / ethnic status and family psychiatric history (APA, 2013). Genetic and physiological factors include, female as opposed to male gender and younger age at time of trauma. Peritraumatic factors include, trauma intensity, perceived threat to life, acquisition of personal injury, whether interpersonal violence has occurred (particularly in children from a caregiver), for military personal risk enhancement occurs for those who have been a perpetrator, witnessed atrocities or killed the enemy and from dissociation that occurs during and after the trauma. Posttraumatic risk factors include, negative appraisals, inappropriate coping strategies (e.g. substance abuse), initial development of acute stress disorder, subsequent exposure to reminders about the traumatic event, adverse life events or other trauma related losses, and a lack of social support (APA, 2013).

The duration of PTSD and PTSD comorbid symptoms has been found to vary, complete recovery occurs within 50% of adult individuals within 3 months, amongst the remaining 50% some individuals may present with symptoms anywhere from 12 months to 50 years after the initial triggering trauma exposure.

The effects of significant potential to trauma exposure and development of PTSD within military personnel has long been established and researched (Fulton et al., 2015) as a result of this occupations whose roles entail a higher risk of trauma exposure, police officers (Perrin et al., 2007), firefighters and ambulance personnel (Corneil et al., 1999) have also been considered as vulnerable groups with high risk factors for the development of adverse symptomology.

Amongst military personnel, studies have found rates of current and lifetime PTSD of 9.1% and 18.7% respectively in samples of Vietnam war veterans (Dohrenwend et al., 2006) the highest rates were found within veterans exposed to the highest levels of combat exposure. Further Vietnam studies reported other disorders were more prevalent than PTSD amongst veterans namely, major depression (4.5% vs 2.3%) and generalised anxiety (4.9% vs 3.3%) Furthermore, for those of the sample with current PTSD, comorbidity was common 66% meeting criteria for major depression and / or generalised anxiety (VES; US, Centres for Disease Control, 1988). Recent conflicts, such as the first Iraq war showed a prevalence amongst samples of 12.1% for subthreshold PTSD with the degree of combat exposure strongly correlated with PTSD (3.3% for minimal exposure to 22.6% for high level exposure; Kang et al., 2003). Further studies indicated rates amongst samples of 6.2% for PTSD and 7.1% for

major depressive disorder (Toomey et al., 2007). The second Iraq war and deployment to Afghanistan showed amongst sampled combatants a prevalence rate of 9.2% for PTSD, rates again corresponded to the level of combat exposure, with individuals with the highest combat exposure displaying rates amongst samples of 19.3% for PTSD (Hoge et al., 2004). Of the number of mental health disorders assessed PTSD proved to be the most common amongst personnel deployed to Iraq (9.8%) and Afghanistan (4.7%) of those screening for PTSD 79.6% reported exposure to direct combat (Hoge, Auchterlonie & Milliken, 2006; Milliken, Auchterlonie & Hoge, 2007) however, PTSD rates for personnel injured during combat were much higher (31.8%) in comparison to uninjured personnel (13.6%). Later research (Schell & Marshall, 2008) indicated a PTSD and depression prevalence rate of 14% amongst those sampled.

In considering the conflicts studied and the literature surrounding them it is evident that combatants display higher rates of PTSD, Anxiety and Depression than the general population, higher PTSD levels are correlated with higher levels of combat exposure and in general PTSD comorbidity is greater than PTSD, Anxiety or Depression on their own.

In considering further at-risk trauma exposed occupations in comparison who are theoretically not exposed to the same prevalence or intensity to trauma as military combatants, such as firefighters, paramedics and first responders differ in that the potential trauma exposure does not routinely involve conspecific trauma potential through violent exposure. This is primarily because the trauma exposure entails the witnessing of violent trauma as opposed to the subjection to it.

Numerous studies show prevalence rates for firefighters and paramedics of between 4-30% for PTSD and 4-22% for anxiety (Jones et al., 2018). In their own studies Jones et al., (2018) found rates of 14% for depression, 28% for anxiety and 26% for PTSD. Similar rates in the UK of 22% have also been found (Bennett et al., 2004; Clohessy & Ehlers, 1999). Suggesting that exposure to trauma and potential development of psychological illness is particularly problematic in this cohort which is evident in the similarity of findings. Overall prevalence rates for PTSD amongst firefighter's specifically is similar and has been shown to range from 17% to 22% (Vieweg et al., 2006). Although PTSD prevalence amongst firefighters in non – western countries is potentially much higher at rates of 57% (Alghamd, Hunt, & Thomas, 2013). Much like military personnel higher PTSD rates have been associated with previous trauma experience and higher exposure (Fullerton et al., 2004). However differences in PTSD symptomology have been found amongst first responders in comparison to military

personnel (Boyd et al., 2018) compared with first responders, military personnel showed higher levels of derealisation, functional impairment, alexithymia, anxiety, and depression, potentially highlighting different symptomology in relation to direct victimisation of trauma as opposed to the witnessing of it. Firefighters with high levels of resilience have been found to be protected from both the direct and indirect impacts of traumatic stress (Lee et al., 2014) and these findings have been further replicated (Onyedire et al., 2017).

Unlike the other occupations listed previously, studies have shown that the prevalence of PTSD in police officers (Mann & Neece, 1990; Carlier et al., 1997; Robinson et al., 1997) maybe less in comparison to general population figures (Carlier et al, 1997; Kessler et al, 2005; Vries & Olff, 2009). However other studies have shown prevalence rates of 26% (Martin et al., 1986) in line with other at-risk occupations again higher rates have been observed in those exposed to higher rates of trauma exposure (Stratton et al., 1984; Manolias & Hyatt-Williams, 1993; Papazoglou, 2013; Troop & Hiskey, 2013). The most recent studies and reviews indicate a prevalence rate of PTSD between 4.5 and 9% (Berger et al., 2012; Maia et al., 2007) with rates of 15-16% with subthreshold PTSD (Maia et al., 2007; Marmar et al., 2006) less than other at-risk occupations but higher than the general population. Police officers have also been shown to develop anxiety, depression and other comorbidity symptoms through trauma exposure (Chopko et al., 2018; Hartley et al., 2012; Lawson et al., 2012; Stanley et al., 2016).

As a result of the discrepancies between and lower rates of PTSD prevalence amongst police officers, researchers have proposed that officers may be better able to cope with the management of trauma exposure. Certain research supports the ability deal with trauma over time through post traumatic growth and that this may occur in police officers (Papazoglou, 2013) through the development of hardiness, hardiness and resilience has been shown to potentially buffer and protect police officers from PTSD (Huart et al., 2017) in similarity to fire fighters (Lee et al., 2014; Onyedire et al., 2017) however, there are inherent difficulties distinguishing between emotional detachment, resilience and hardiness and it has been suggested that these are the same construct and / or separate variables with significant overlap (Caska & Renshaw, 2013; Lee et al., 2014). Furthermore, research has found in certain individuals' exposure to repeated trauma may increase resilience; whereas the reverse can also be true (Figley, 1985, 1986; Wilson, 1989, 1995; Wilson & Raphael, 1993; Wilson & Drozdek, 2004).

In consideration of the literature surrounding prison personnel which the current thesis has informed as a sample, studies indicate that it may be a problematic occupation in relation

to trauma exposure (Konda et al., 2013; Schlosser et al., 2010; Spinaris et al., 2012; Denhof & Spinaris, 2016). The general literature has highlighted a range of occupational and organisational working conditions that are particularly problematic with varying outcomes (Kunst, 2011).

Reviews of 43 official investigations in nine European and American countries revealed high work constraints amongst PO's involving, role ambiguity (Dollard & Winefield, 1994; Triplett et al., 1996), role conflicts (Dollard & Winefield, 1994; Grossi & Berg, 1991; Triplett et al., 1996; Whitehead & Lindquist, 1986), lack of participation in decision making (Lindquist & Whitehead, 1986), low social support at work, management problems, job pressure, low decision latitude (Dollard & Winefield, 1994), limited promotional prospects, overtime fulfilment demands (Triplett et al., 1996), health and safety concerns (Grossi & Berg, 1991; Grossi et al., 1996; Triplett et al., 1996; Triplett et al., 1999) and constantly working with the same inmates (Triplett et al., 1996, 1999) shift schedules, position held, and lack of experience (Dollard & Winefield, 1994) indicating organisational factors as opposed to occupational conditions that are problematic.

Other areas identified include recruitment and retention and staff turnover rates (Tipton, 2002; Sumter, 2008; Minor et al., 2011; Ministry of Justice, 2018) leading to reliance of overtime to compensate for low staffing levels (Higgins et al., 2013). Prison overcrowding has been an historic and contemporary problem area particularly in the UK (Ministry of Justice, 2017). Overcrowding within a prison generates higher workloads for PO's, individual workloads can heighten individually perceived levels of stress (Dollard & Winefield, 1998) however overcrowding may independently contribute to stress amongst PO's because of the reduced ratios of staff to prisoner numbers (Finn, 2000). As a consequence of reduced officer numbers and overcrowding, violent incidents may ensue between prisoners and staff and prisoners', perpetuating stress levels, as well as diminishing perceptions of workplace safety (Spector et al., 2007). Further issues identified in the prison literature include low levels of organisational forms of structure pertaining to centralisation, instrumental communication, integration, and legitimacy (Lambert et al., 2006) as well as further environmental factors, such as inadequate sanitation, dilapidated accommodation and poor architectural design within prisons (Bierie, 2012). Levels of experience have been identified as problematic with varied findings. Greater levels of experience have been associated with greater role conflict, role ambiguity, job dissatisfaction, along with positive and negative modifications to family and work relationships (Clemente et al., 2015). Inexperienced PO's report higher levels of fear of

victimisation by prisoners, fear of victimisation also increases with the security level of the prison (Lai, Wang, & Kellar, 2012).

In focusing in more on such occupational factors (factors intrinsic to the role of PO's universally in relation to prisoner - staff relationship dynamics). Fear of prisoners amongst PO's has been shown to be a causation of stress amongst PO's (Gordon & Baker, 2017). Female PO's report greater perceived fear of victimisation by prisoners and overall feelings of reduced safety as opposed to male PO's (Garcia, 2008; Gordon & Moriarty, 2007; Gordon et al, 2013). Fear appears to be a causational factor as opposed to a predictive outcome (Stichman & Gordon, 2014; Taxman & Gordon, 2009). PO's fear and perceived danger has been linked to increased stress and negative job satisfaction in many studies (Dowden & Tellier, 2004; Lambert et al., 2007). Amongst the many factors that have been associated with adverse outcomes amongst PO's the fear of violence is highly significant (Schaufeli & Peeters, 2000).

Most of the literature which considers organisational variables has focused on stress as an outcome variable with little consideration of other adverse psychological outcomes. Studies surrounding burnout amongst prison personnel have attempted to focus on both organisational and occupational variables. High prevalence rates of burnout amongst PO's have been reported (Harizanova & Tarnovska, 2013; Xanthakis, 2009). Lambert et al., (2015) found all the components of burnout are affected by a longer length of service in PO's. However, younger and more inexperienced staff have also been found to have the highest levels of burnout. (Morgan et al., 2002; Harizanova & Tarnovska, 2013) indicating there maybe unique variations between cohorts that requires further research to elucidate. Male PO's have reported higher levels of depersonalisation and reduced sense of accomplishment in comparison to female officers but both genders did not differ on levels of emotional exhaustion (Carlson et al., 2003). Other studies have reported male and female officers did not differentiate on overall levels of burnout (Savicki, Cooley & Gjesvold, 2003).

Overall research on the causes of job burnout among prison personnel are more common than research on the possible consequences or outcomes of job burnout. Correlations have been found between burnout and staff absenteeism (Garner et al., 2007), turnover levels (Neveu, 2007), high staff sickness levels (Lambert et al., 2010) as well as low job satisfaction and work-related stress (Griffin et al., 2010) and higher daily contact with prisoners (Whitehead & Lindquist, 1986) indicating it maybe predominately influenced by organisational factors as opposed to mainly occupational factors (Hu et al., 2015). One aspect that has been explored further with burnout as opposed to stress in prison personnel are mediating variables. Coping

styles have been investigated as well as social support (Cieslak, 2008; Gould et al., 2013) organisational support (Lambert et al., 2010) levels of trust in management (Lambert et al., 2012) job autonomy and job variety (Griffin et al., 2012) organisational perceptions of justice (Lambert et al., 2010)

A major limitation of the burnout studies is the focusing on staff working in a variety of institutional positions, with fewer studies focusing exclusively on the subgroup of PO's and even fewer focusing on different subgroups. Furthermore, despite the empirical emphasis on the causes of burnout, there has been almost no research on effective interventions designed to deal with prison personnel burnout therefore, significant gaps remain in the literature (Lambert et al., 2015).

Trauma exposure and the possible development of psycho-symptomology has become an area of focus within the literature since prison personnel have been considered by academics as an at-risk occupation. Numerous studies support this notion internationally (Bureau of Labor Statistics, 2015; Denhof & Spinaris, 2013; Denhof et al., 2014; Konda et al., 2013; Spinaris et al., 2012; Stadnyk, 2003) and within the UK (Kinman et al., 2014; Ministry of Justice, 2016, 2017, 2018).

Prison Officers have been identified as particularly at risk in relation to other prison personnel (Denhof & Spinaris, 2013; Obidoa et al., 2011; Spinaris et al., 2012; Stadnyk, 2003). Much like the other at-risk occupations considered prison personnel demonstrate similar and in cases higher prevalence rates for PTSD and are higher than the general population (Denhof & Spinaris, 2013). Prevalence rates of 27% within samples (Spinaris et al., 2012) 26% (Stadnyk, 2004) 33.7% (Denhof & Spinaris, 2016) 36.7% (Wright et al., 2006) and 19% (James & Todak, 2018) have been found.

Prevalence rates for Depression amongst samples of 28.7% and 22.1% for male and female officers respectively (Denhof & Spinaris, 2013) 36.3% (Denhof & Spinaris, 2016) with a Comorbidity prevalence of 24.9% also, has been found.

Further to these rates it has been found front line staff report higher rates (Denhof & Spinaris, 2016) as do staff with higher experience (James & Todak, 2018; Denhof & Spinaris, 2016) and staff working in prisons with a higher security category (Denhof & Spinaris, 2016). Research also indicates violent interactions lead to the development of PTSD and S-PTSD (Boudoukha et al., 2013). Little research has been carried out to investigate mediating variables between trauma exposure and development of PTSD that which has found avoidance, prior

experience of suicide, and level of involvement in the incident were direct mediators of the impact of the event, whilst perceived control, emotional support, and problem-solving style had an indirect effect. (Wright et al., 2006).

It is evident that the literature surrounding prisons shares commonalities and strengths in focusing on organisational or occupational causation of adverse problems, the predominant limitation is that they seldom consider both factors together within the same studies and fail to separate and control for these factors and the contribution each may make to the presence of symptoms. Similarly, criticism regarding rates of PTSD in Police officers have proposed this as a problematic area also highlighting there is difficulty in discerning work related and non-work-related stress (the extent to which personal issues e.g. in marriage, financial difficulties etc. may play a contributing factor) as well as occupational (role related stressors, i.e. trauma incidents) and organisational related stressors (Chopko et al., 2018).

However, that said the identification of problematic organisational causation variables need to firstly be isolated to highlight the sociological environment that is created and subsequently the potentially exacerbated occupational risk factors that can then be considered, scrutinised and measured.

Although studies in the prison literature have addressed causation few have considered potential mediators or preventative focus in regard to adverse psychological outcomes and these remain sporadic and disparate. What is also evident is staff attitudes and how they develop maybe influential in relationships with prisoners and the potential problems that may arise, and a more qualitative focused research methodology may be needed to ascertain these variables. Similarly, feelings toward the work and how these become problematic requires further exploration qualitatively in order to fully ascertain the potential development of adverse psychological conditions.

Burnout has been little considered in comparison to PTSD and Depression as an outcome of persistent and chronic exposure to violence or other problematic and emotionally draining behaviours and incidents and may in fact be highly correlated. Again, further research is needed to explore this factor also. It is evident in the literature that aspects have been separated and considered as separate entities rather than considering how the sociological environment plays out and how all aspects may be intrinsically connected.

Anxiety although shown to be correlated and present with PTSD in the general PTSD literature has unlike Depression received extremely limited attention or measurement. A further

factor that may produce discrepancies on the prevalence of PTSD and other symptomology amongst prison personnel is the lack of official organisational statistics regarding these aspects thus creating an over reliant focus on self-report study.

In considering these factors it becomes apparent it is difficult to compartmentalise specific stressor related concepts as attributable solely to organisational or occupational stressors alone without providing a measure of firstly isolating the variables of both entities. It is clear from the literature that PO's are susceptible to a wide array of adverse psychological outcomes because of the nature of their roles and the literature within this area particularly in respect to PTSD, anxiety and depression is limited and uncomprehensive in its adhesion. Therefore, in light of taking criticisms of previous research into account and the lack of clarity surrounding trauma exposure and PTSD, depression, anxiety and comorbidity, it highlights the need to consider organisational and occupational variables firstly separately to identify specific problematic variables and then to consider both aspects in tandem. Variables then need to be measured and controlled for and mediators and moderators considered before recommendations for preventive strategies can be employed.

CHAPTER TWO:

Methodology

2.1 INTRODUCTION

The following general methodology chapter refers to the standard procedures that apply to the three empirical chapters. Any variations in the standard methodology will be highlighted in the chapters corresponding to the relevant studies. The present study utilised a robust methodological design the aim of the current chapter is to provide a detailed description of the methodology used as well as the design, the population (of Her Majesty's Prison and Probation Service, England & Wales, as well as The Prison Officers Association) during the time of data collection in 2017, and the sample (sampling procedure, and the details of the sample obtained) utilised. Each of the established measures used in the thesis are discussed in depth, The Hospital Anxiety and Depression Scale (HADS), and The Posttraumatic Stress Disorder Checklist – Civilian Version (PCL-C). The most complex analytical procedures employed are also detailed in this chapter (i.e., confirmatory factor analysis, composite reliability, latent profile analysis, multiple regression analysis, multinomial logistic regression, moderated regression analysis). Lastly, the specific software programs utilised for data collection and analysis (i.e., Qualtrics, SPSS, Mplus, and ModGraph) will be discussed. Overall background information and knowledge on the complex statistical theories and methods employed, in order to provide clarity and understanding when reading the subsequent methods sections in relation to the three empirical chapters are therefore provided.

2.1.1 Ethical Declaration

All of the three studies undertaken as part of this thesis complied with the British Psychological Society's ethical regulations for the treatment of human subjects in research (BPS, 2018) and were further approved by the University of Huddersfield's ethical research committee, as well as the National Executive Committee of The Prison Officers Association (please see appendices section).

2.2 DESIGN

2.2.1 Cross-Sectional Survey Design

A cross-sectional survey design was applied to the current thesis. Cross-sectional studies measure a set of specified variables at a given point in time as opposed to longitudinal and experimental designs. Participants are selected purely by the inclusion and exclusion criteria set by the study. Cross-sectional designs are used for population-based surveys and are therefore intended to be generalised to the larger population beyond the sample targeted. They provide a means for rapid, cost-effective and minimal time constraining gathering of a potentially large amount of data. Several associations can be made from the data gathered however, because the data is collected at a point of time it is difficult to establish causational relationships from subsequent analysis (Setia, 2016). In the case of this thesis, a survey was designed consisting of demographic questions, and the following established measures: Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983), and The Posttraumatic Stress Disorder Checklist – Civilian Version (PCL-C; Weathers, Litz, Herman, Huska, & Keane, 1994).

2.2.2 The Population of Prison Personnel within England & Wales

The Prison System of England and Wales comprised (as of July 2016) $N = 121$ Prison Establishments detaining $N = 85{,}523$ prisoners (male offenders $n = 81{,}533$, female offenders $n = 3{,}990$) as well as $n = 3$ NHS (National Health Service) secure psychiatric hospitals detaining $n = 795$ patients. Individuals admitted to High Secure Services are detained under the Mental Health Act (1983 amended in 2007) and fulfil the criteria as defined by the NHS Act 2006 that states the following, “for people who may require treatment under conditions of high security on account of their dangerous, violent or criminal behaviour, high secure services are provided in hospitals that have physical security arrangements equivalent to a category B prison. They can, however, treat individuals who in a prison setting would be in a category A environment.” The Prison System is further sub-divided by $n = 4$ security categories (A, B, C and D). A category prisons consist of inmates who may have the means and / or whose escape would be highly dangerous to the public or national security. B, those who do not require maximum security, but for whom escape would still pose a large risk to members of the community. C, those who cannot be trusted in open conditions but who are unlikely to try to escape. D, those who can be reasonably trusted not to try to escape and are given the privilege

of an open prison. Prisoners that may subject to approval be given ROTL (Release on Temporary Licence) to work in the community or to go on "home leave" once they have become eligible. Only male prisoners are categorised A, B, C and D, female prisoners are simply held in closed or open conditions and are categorised as such. Prisoners are termed adults at *21+* years of age, Young Offenders *18 – 21* years of age and Juvenile's *15 – 18* years of age. Prisoners transferred to secure hospitals under the Mental Health Act are referred to as patients.

In July, 2016 there were *n* = 8 High security Prisons used to house and disperse category A prisoners, *n = 10* Women's prisons, *n = 14* privately contracted prisons (administered by Group 4, Sodexo and Serco as opposed to HMP [Her Majesty's Prison Service]), *n = 10* open Prisons for Category D, male, female and Young Offender prisoners, *n = 14* Young Offenders Institutions, *n = 4* Juvenile establishments. The remaining establishments within the estate are used to house Category B and C prisoners with some detaining Young Offenders also and make up the overall majority of the Prison establishments.

NOMS (National Offender Management Service, renamed, HMPPS [as of February 2017] Her Majesty's Prison and Probation Service) was the largest employer in England and Wales of Prison Personnel. NOMS (September 2016) comprised *n* = 43,060 staff, *n* = 23,613 Operational Staff, n = 10,648 Non – Operational Staff, n = 8,799 NPS (National Probation Service). Operational staff comprise the mainstay of personnel tasked with the management and supervision of offender's whilst in custody. Probation Officers are concerned with an offender's management and location upon release from custody. Operational staff are further sub – divided into, *n* = 933 Governor Grades tasked primarily with the overall management of an establishment. Uniformed staff, *n* = 1,340 Custodial Managers (formerly Principal Officers), *n* = 2,057 Supervising Officers (formerly Senior Officers), *n* = 14,607 Prison Officers, *n* = 4,676 Operational Support Grades tasked primarily with the day to day management of security within an establishment (The Prison System has since been modified in terms of the number of establishments fulfilling certain roles, security classifications, prison closures, opening of new prisons, and staffing numbers, all figures shown are relevant to the period of data collection for this thesis).

The Prison Officers Association (POA) is the largest trade union body representing custodial and secure psychiatric workers in the UK with a membership of between 90 - 95% (20,250 – 21375, December 2016) of Public Sector Prison Personnel (Custodial Manager's, Supervising Officers, Prison Officers and Operational Support Grades) in England and Wales.

2.2.3 Sampling Method

In all three studies of the thesis, non – probability sampling was used (prison personnel that were willing to participate in the research were opportunistically recruited). Non – probability sampling refers to when participants are selected on the basis of their availability or because of the researcher's personal judgment that they are representative. The studies within the thesis all used opportunistic convenience sampling. Convenience sampling is employed when the researcher utilizes a sample from which they have easy access to (at the time of data collection the author of the thesis was employed as a full time Prison Officer by Her Majesty's Prison Service and was a member of The Prison Officers Association). Participants were recruited opportunistically from POA members based in England and Wales via an e-mail invite, sent to all members to participate in a study of work-related stress and mental health. The project was not registered or required to be with the Prison Service National Research Committee and was solely managed by the NEC of the POA therefore only POA members were permitted to participate.

2.2.4 Participants

A total of N =1995 prison personnel responded and returned completed surveys. Due to some of the returned surveys having significant missing data and a limited representative sample from Category D prisons and Secure Psychiatric Hospitals, N = 1562 respondents were included in the final analysis of all three studies in the thesis. The sample consisted of n = 948 male and n = 614 female participants. Eight hundred and seventeen (n = 817) of participants were married, n = 354 living with partner, n = 10 widowed, n = 116 divorced, n = 53 separated, and n = 212 single. Their age ranged from 19 to 71 years (M = 43.08, SD = 10.76, *Median* = 45) and reported length of prison work experience ranged from 1 to 43 years (M = 14.24, SD = 8.58, *Median* = 13). One thousand and thirty-nine (n = 1039) of the participants were prison officers, n = 288 supervising officers, n = 128 custodial managers and governor grades, and n = 107 operational support grades. Of these n = 1428 worked for the public sector (Government) and n = 134 worked for the private sector.

In respect to the overall operational workforce, the sample equated to n = 6.6% of the operational workforce, custodial managers and governor grades n = 5.6%, supervising officers n = 14%, prison officers n = 7.1% and operational support grades n = 2.3%.

In typology of security classification n = 284 participants were from Category A establishments (prisoners whose escape would be highly dangerous to the public or national

security), *n* = 732 from Category B (prisoners who do not require maximum security, but for whom escape still needs to be made very difficult), and *n* = 546 from Category C (prisoners who cannot be trusted in open conditions but who are unlikely to try to escape). Ninety (*n* = 90) participants were from female prison establishments, *n* = 1002 from male prisons, *n* = 87 from male young offending institutes, and *n* = 383 from mixed adult and young offending establishments. In typology of predominate work area *n* = 1081 participants reported working on wings/landings, *n* = 253 in segregation units, *n* = 145 in offender management units, *n* = 211 in reception, *n* = 257 in visits area, *n* = 236 in operations/security department, *n* = 212 of participants were residential supervising officers and custodial managers, *n* = 88 located in office based work, and *n* = 182 in other areas (note some participants reported more than one predominate work area within a weekly period due to the cross deployment nature of some prison establishments). In relation to amount of direct contact with prisoners *n* = 972 of participants reported contact all of the working day, *n* = 362 most of the working day, *n* = 152 half of the working day, *n* = 67 approx. two hours per working day and *n* = 9 of participants reported no direct contact with prisoners.

Of the sample, *n* = 407 reported being smokers and *n* = 417 reported drinking in excess of the recommended National Health Service UK guidelines of 14 units of Alcohol a week, *n* = 627 reported being diagnosed during their career with a classified mental health illness by a medical professional as a direct result of their work and *n* = 624 reported receiving treatment during their career for a classified mental health illness by a medical professional as a direct result of their work, *n* = 754 participants reported being absent from work during their career due to a classified mental health illness as a direct result of their work, of these *n* = 202 were absent for a week or less, *n* = 118 for a week to one month, *n* = 134 for one month to three months, *n* = 167 for three months to six months and *n* = 133 for six months or more.

2.3 MATERIALS

2.3.1 Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983)

The Hospital Anxiety and Depression Scale (HADS) is a 14-item self-rating questionnaire measuring 'depression' and 'anxiety' (Zigmond & Snaith, 1983). Seven of the items relate to anxiety and seven relate to depression. Zigmond and Snaith created the HADS to isolate specific depression and anxiety symptomology and to avoid reliance on the aspects of the conditions that are also common somatic symptoms of other illnesses, therefore creating a measure that could incorporate the detection of anxiety and depression in individuals with physical health problems. Each item on the questionnaire is scored from 0-3 and this means that a person can score between 0 and 21 for either anxiety or depression. The HADS uses seven days as reference period. Each item on the questionnaire is scored from 0-3 and this means that a person can score between 0 and 21 for either anxiety or depression. The depression scale (7 items, score range 0–21) measures mostly anhedonia, (inability to feel pleasure in normally pleasurable activities) a phenomenon considered to be the central characteristic of major depressive disorder (Snaith, 1987). The anxiety scale (7 items, score range 0–21) measures mostly symptoms of generalized anxiety disorder (Snaith, 2003). For both HADS scales higher scores represent higher symptom levels. The HADS is scored in two ways, using a total score cut-off method, where a summation of all item scores for the seven items relating to depression and the seven items relating to anxiety, scores between 11-21 define someone as an abnormal case, 8-10 borderline abnormal, 0-7 normal, for depression and anxiety respectively. A number of researchers have previously explored HADS data to establish the cut-off points for identification of anxiety or depression. Bjelland et al., (2002) identified a cut-off point of 8/21 for anxiety or depression. For anxiety (HADS-A) this gave a specificity of 0.78 and a sensitivity of 0.9. For depression (HADS-D) this gave a specificity of 0.79 and a sensitivity of 0.83.

The depression and anxiety scales are intended to detect depressive and anxiety disorders in general medical settings. The depression scale is specifically intended to select those depressed patients which may be helped by the prescription of an antidepressant drug (Snaith, 1987). The HADS scale employs the two cut-off points, one for the detection of 'possible' and one for the detection of 'probable' depressive or anxiety disorder. The HADS is well-established and widely used by clinicians to measure anxiety and depression and to asses

these respective levels in patients. The psychometric properties of the HADS have been reported and established in previous studies (Spinhoven et al., 1997, Herrmann, 1997, Bjelland, Dahl, Haug, & Neckelmann, 2002).

2.3.2 The Posttraumatic Stress Disorder Checklist – Civilian Version (PCL-C; Weathers, Litz, Herman, Huska, & Keane, 1994)

The Posttraumatic Stress Disorder Checklist – Civilian Version (PCL-C) is a 17-item questionnaire (Weathers, Litz, Herman, Huska, & Keane, 1994) based upon the Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV) criteria for PTSD (American Psychiatric Association, 1994). The PCL-C utilizes a Likert-type rating scale for each item, where respondents indicate the extent of symptoms experienced during the past 30 days along a continuum, respondents rate each item from 1 ("not at all") to 5 ("extremely") to indicate the degree to which they have been bothered by that particular symptom over the past month. Item ratings of 3 or higher are considered symptomatic or clinically substantial.

The PCL-C is scored in two ways, (1) a total score cut-off method, where a summation of all item scores greater than or equal to 51 defines someone as PTSD positive, and / or (2) a symptom cluster method, where DSM-IV criteria for PTSD are met based on DSM-IV criteria B, C, and D: requiring at least one cluster B item (questions 1-5) with a score of three or higher, plus at least three cluster C items (questions 6-12) with a score of three or higher, plus at least two cluster D items (questions 13-17) with a score of three or higher. Three versions of the PCL are available; The PCL-C is a general civilian version that is not linked to a specific event; the questions refer to "a stressful experience from the past".

A substantial amount of research has supported the validity, measurement and diagnostic capability of the PCL-C and it has previously been widely used in clinical and research settings, as well as performing comparably to clinician administered PTSD scales and within large population samples (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996; Orsillo, 2001; Ruggiero, Del Ben, Scotti, & Rabalais, 2003; Bertelson, Brasel, & deRoon, 2011; Gardner, Knittel-Keren, & Gomez, 2012; Keen, Kutter, Niles, & Krinsley, 2008; McDonald & Calhoun, 2010; Elhai, Gray, Kashdan, & Franklin, 2005; Bollinger, Cuevas, Vielhauer, Morgan, & Keane, 2008; Forbes, Creamer, & Biddle, 2001). With the publication of DSM-5 (APA, 2013) the PCL-C has been updated to the PCL-5 (Weathers, Litz, Keane, Palmieri, Marx & Schnurr, 2013; Blevins, Weathers, Davis, Witte & Domino, 2015) to incorporate the new diagnostic criteria for PTSD and changes within the DSM-5.

2.3.3 Prison Personnel Trauma Measure (PPTM; to be validated in this thesis)

Formulated for the current study to assess potential occupational trauma exposure and chronic stress predictors that are specifically intrinsic to the work of prison personnel, $N = 19$ items were designed to determine types and frequency of stressors / trauma prison personnel are subjected to in the course of their duties. Respondents rated each item on a 4-point Likert scale ranging from 'never', '1 to 10 times', '11 to 20 times', '21 or more times'. Items were selected for their abilities to encapsulate a scenario specific to the occupational role requirement of prison personnel with particular relevance to Prison Officers (i.e. in their interactions with prisoners) as opposed to the organizational stressors that may be a consequence of managerial practices, institution polices, designated workloads and influences of government policies and resource injection. The following items were put to the selected participant sample with a view to testing predictive validity and psychometric validation of each item for inclusion in the finalised PPTM. Participants were asked 'In your current role have you ever__ (choice item) __'? and asked to record the frequency of the item.

(Please see appendices section for further detail of measures).

Table 2.1 Prison Personnel Trauma Measure (PPTM) pre-validation.

Item	Never	1-10 times	11-20 times	21+ times
1. Have you ever been threatened physically by a prisoner				
2. Have you ever been physically assaulted by a prisoner				
3. Have you ever been verbally abused by a prisoner				
4. Have you ever been subjected to passive aggression i.e. intimidation				
5. Have you ever witnessed prisoner on prisoner violence				
6. Have you ever witnessed prisoner on staff violence				
7. Have you ever witnessed staff on prisoner violence				
8. Have you ever been subjected to an assault with excrement by a prisoner				
9. Have you ever worked completely isolated from other staff for long periods of time with prisoners				
10. Have you ever worked on poorly designed wings i.e. narrow corridors, blind spots				
11. Have you ever worked in dirty protest conditions (where prisoner has smeared excrement around their cells etc.)				
12. Have you ever been involved in a cell fire extraction (removed a prisoner from a burning cell)				
13. Have you ever witnessed self-harm behaviour by a prisoner				
14. Have you ever witnessed suicide attempts by a prisoner				
15. Have you ever witnessed the death of a prisoner or colleague				
16. Have you ever suffered a needle stick injury whilst searching a prisoner / prisoner's accommodation				
17. Have you ever had a false allegation made against you by a prisoner (which led to an official investigation)				
18. Have you ever been sent on compulsory detached duty				
19. Have you ever worked on SOTP (sex offender treatment programmes) courses or similar				

Note: an assault with excrement is that where a prisoner has purposely used faeces or urine to throw over a member of staff; dirty protest conditions are those in which a prisoner has used excrement (faeces) to smear on themselves or their cells or both; needle stick injuries are classified as those that occur through penetration of the skin by a hypodermic syringe (needle) or similar sharp object where there is a risk of blood borne infection, such as a razor blade that has been used by a prisoner to self – harm with or a syringe to inject drugs; compulsory detached duty is where personnel are sent to work in another prison away from their parent establishment without volunteering, usually to cover chronic shortages of staff at the recipient prison; SOTP (sex offender treatment programmes) courses or similar are part of a range of psychological treatment therapies used to help prisoners identify and address offending behaviour, and often involve the divulging of graphic and detailed accounts of their crimes.

The itemised list was by no means exhaustive but sought to encapsulate some of the more common and less rarer occurring incidents that are a direct consequence of the actions and behaviours of prisoners and prison environments that prison personnel may be tasked to deal with, whilst avoiding a certain amount of overlap between items i.e. dealing with an intoxicated prisoner may be deemed traumatic in itself however if that prisoner subsequently died or assaults a member of staff whilst intoxicated, in this case it would stand to reason the severer of the two incidents would be deemed most appropriate to meet trauma criterion.

2.3.4 Demographic and Work History Report Form

The demographic and work history report form was developed for the project to record personal and work history information pertaining to employment within a prison environment. Participants were asked to record personal information of; gender, age, marital status with six sub categories (married, widowed, divorced, separated, single or living with partner), if they were smokers, alcohol consumption per week (never, less than 5 units, 5 to 14 units, 14 to 21 units and 21 plus). Participants were also asked to record if they had ever been diagnosed during their career with a classified mental health illness by a medical professional as a direct result of their work and if they had ever received treatment during their career for a classified mental health illness by a medical professional as a direct result of their work. Participants were also asked to report the duration they had been absent from work during their career due to a classified mental health illness as a direct result of their work (for 1 week or less, for 1 week to 1 month, for 1 month to 3 months, for 3 months to 6 months and for 6 months or more).

With relation to work history participants were asked to record; experience (years of service), whether they worked for public (government) run prisons or private sector run prisons, establishment category (A, B, C, D) and establishment type (women's, men's, male young offenders, mixed adult and young offenders). Current grade (Prison Officer, Supervising Officer, Custodial Manager, Governor Grade, Operational Support Grade). Participants were asked to identify their main area(s) of work (wing's / landings, segregation, offender management unit, reception, visits, operations / security, residential Supervising Officer / Custodial Manager, office-based role or other). They were then asked to identify how much prisoner contact they had during the working day (all of, majority of, moderate amount of, small amount of and none of).

2.4 STUDY PROCEDURE

2.4.1 Development

The project was developed initially by contacting the Prison Officers Association (POA) northern branch office based in Leeds (UK) and speaking to their research liaison officer, with a view to carrying out a research project on work related stress and mental health of Prison Officers within the UK. After initial consultation and advice, a dual application was made to the University of Huddersfield, Human and Health Sciences School Research Ethics Panel (SREP), and to the National Executive Committee (NEC) of The Prison Officers Association (POA), outlining the full details and intentions of the project. The research protocol was then reviewed and approved by the SREP and NEC.

2.4.2 Data Collection

Data was collected between July and December 2016. Participants were recruited opportunistically from POA members based in England and Wales via an e-mail invite (using secure personal work email accounts via government intranet email systems), initially the email was sent to all branch officials and then further distributed to all POA members within each prison establishment with the invitation to participate in a study of work-related stress and mental health. Within this e-mail, it was made clear to potential participants that they did not need to have experienced mental health illness or stress to take part. Within the email invite a link was provided to complete the survey developed in Qualtrics, a web-based interface that allows for secure remote data collection through the distribution of anonymous secure links to the survey instrument. Due to the implementation of internet access for staff (post 2015) within prisons, personnel were able and permitted to complete this during working hours.

2.4.3 Informed Consent

Prior to undertaking the survey, participants were required to provide a consent. They were also made aware of what was required of them via an introduction screen detailing all necessary information about the project. Participation in the current study was voluntary, and no inducements or obligations were used. All participants were debriefed and given contact references for institutional and national mental health services, as well as the contact details of the lead researcher, his supervisor, and the University of Huddersfield.

2.4.4 Confidentiality and Data Handling

In light of the specifications and handling of Qualtrics data and in the anonymous guaranteed nature of the research, confidentiality assurance was applied in the following ways; participants were not asked to provide any identifying information thus identification of single individuals was not possible, it was made clear on the information sheet to participants that any identifying information i.e. name, was not sought for the purposes of the current research and all information that was provided was to be kept confidential, the lead researcher and supervisor were the only people with a secure password protected account to access Qualtrics and subsequent completed survey information. Upon completion of the data collection all the survey data was uploaded to SPSS and subsequently downloaded and held in an encrypted file any data still held on Qualtrics was then permanently deleted.

2.5 ANALYTIC PROCEDURES

2.5.1 Confirmatory Factor Analysis

2.5.1.1 Background

A structural equation model (SEM) is referred to as a confirmatory factor analysis (CFA) when only non-directional relationships, such as covariances and correlations, are assumed between the latent variables in the structural model, rather than the directional paths in latent regressions, or when the factors are assumed to be orthogonal (uncorrelated). CFA is often utilised to test whether a psychometric scale or set of subscales has a hypothesised construct validity and factorial solution (e.g., one, two, three-factorial and so forth; Geiser, 2013). CFA assumes the observations that any theoretical notion that indicates a set of correlations, and also that theoretical notion is valid, it should replicate these patterns of correlations within the data. However, one predicted pattern of correlations should not be assumed to be correct only that it is merely plausible as there may be the possibility another theory may yield the same correlational pattern (Kelloway, 2015).

2.5.1.2 Process

There are five stages evident in the application of CFA, model specification, identification, estimation, assessment of fit, and model modification (Bollen & Long, 1993). The model specification stage aims to clarify exactly what relationships the model is proposing. For example, in the development of the Prison Personnel Trauma Measure (PPTM) within this thesis the first factor (violent) is measured by eight items (observed indicators), the second factor (environmental) by four items and the third factor (self-harm/death) by three items.

In the case of the model identification stage any issues are usually managed by default within the CFA. It is generally hypothesised that unobserved variables are the cause of the observed variables (Bollen, 2014). There are three rules to model identification: (1) it cannot contain more estimated parameters than unique elements in the covariance matrix, (2) three observed indicators are the minimum for each unobserved factor, (3) latent factors can be correlated but correlations between error variances are not permitted (Bollen, 2014).

The estimation stage seeks to determine the nearness of the inferred covariance matrix to the observed covariance matrix (the actual data). The maximum likelihood (ML) is the mostly used estimator with large and normally distributed data (the chi-square test provides

good maximum likelihood estimation but is highly sensitive to large data) (Bollen, 2014). If the data is not normally distributed or items are measured at categorical level (including short Likert scale) other estimators should be considered (e.g., WLSMV) (Kelloway, 2015).

The next stage is the model fit (the model must be assessed for fit to evaluate how well it matches the observed data). A non-significant χ^2 has been proposed as desirable (Kline, 2005) because it suggests no significant difference between the population covariance matrix and the matrix proposed in the model. However, with large data a non-significant χ^2 is unlikely to occur therefore additional fit indices should be calculated, such as the standardised root mean square residual (SRMR). The SRMR ranges from 0 to 1 and values less than .08 indicate a good model fit (Hu & Bentler, 1999). Another is the root mean square error of approximation (RMSEA; Steiger, 1990). With RMSEA smaller values represent good model fit, with values below .08 representing a good fit to the data and values below .05 a desirable model fit (Beaujean, 2014). Furthermore, the weighted root mean square residual (WRMR) should also be considered to compare competing models when the data is categorical (including Likert scales), with the smallest value suggesting the best model.

The second traditional assessment of model fit involves the use of comparative fit indices. Two indices are generally used the comparative fit index (CFI) and Tucker-Lewis index (TLI) (Bollen, 2014). Both indices range between zero and one, with higher values indicateing better model fit. Values of .95or above in both CFI and TLI represent a good model fit, whereas values between .90 and .95 represent a reasonable model fit (Hu & Bentler, 1999).

Model modification helps to improve either the fit of the model or parsimony (MacCallum, 1986). Either a theory trimming approach or a theory building approach, the former involving deleting non-significant paths the latter adding paths due to the empirical results (Pedhazur, 1982). Varied solutions may also include ceasing testing and concluding the theoretical notion if the model's development is unsubstantiated or using the findings of the ill-fitting model to guide re-direction to new model generation (Beaujean, 2014).

2.5.2 Composite Reliability

Traditional approaches that measure reliability of scales have been critiqued for over and underestimating the reliability of scales (Raykov, 1997), therefore it has been recommended that composite reliability should be reported within CFA context, as opposed to Cronbach's α (Boduszek et al., 2016). This thesis examines the internal reliability of the Prison

Personnel Trauma Measure (see chapter 3) by calculating composite reliability. Composite reliability is calculated by this formula:

$$\rho_C = \frac{\left(\sum_{i=1}^{m} \lambda_i\right)^2}{\left(\sum_{i=1}^{m} \lambda_i\right)^2 + \left(\sum_{i=1}^{m} (\theta_i)\right)}$$

Where ρc = reliability of the latent variable score, λi = standardised factor loading, and θi = standardized error variance. Values greater than .60 are acceptable (Boduszek et al., 2013).

2.5.3 Regression Analyses

The current thesis utilised several types of regression analysis, multiple regression (please see results in chapter 3), multinomial logistic regression analysis (see results in chapter 4) and moderated regression analysis (see results in chapter 5).

2.5.3.1 Multiple Regression Analysis

Multiple regression (MR) allows the examination of the relationship between one dependent variable (DV) and several independent variables (IV's). It assesses how well a set of IV's can predict a particular outcome (DV) as well as which IV is the best predictor of the DV (via. its statistical significance). It also enables assessment of how well that variable is still able to predict the outcome when the effects of another variable are controlled for. It is also capable of explaining the variance amount in the DV by all the predictor variables. Hierarchal multiple regression (employed in this thesis) is carried out by entering the IV's into the equation sequentially based on the theoretical grounds set by the researcher as opposed to standard multiple regression where all IV's are entered into the equation simultaneously. Each IV is then assessed to see what contribution it adds to the prediction of the DV after the other IV's have been controlled for. The overall contribution of each sequence is then assessed to evaluate the overall fit to the model (Miles & Shevlin, 2011).

2.5.3.2 Multinomial Logistic Regression

Multinomial Logistic Regression (MLR) is used to investigate outcome variables for responses that are non-ordered and is an extension of binary logistic regression. It is appropriate when the outcome variable is categorical with more than two categories and the predictor variables are of any type, categorical or continuous and this enables the prediction of a discrete outcome. Primarily MLR predicts group membership but also evaluates the probability of membership of the group based on the combination of values of the IV's (Hutcheson &

Sofreniou, 1999). The odds ratio which is reported represents the change in the odds of being in one of the categories of outcomes when the value of a predictor increases by one unit (Tabachnick & Fidell, 2013).

Analysis is undertaken by selecting one group to act as a reference group. All data is added into a single MLR analysis from the non-ordered groups. The overall likelihood ratio χ^2 test of model fit of the combined regression equation indicates a good fit when the *p* – value is less than the established cut off (e.g., $p < .05$) (Hutcheson & Sofreniou, 1999). Further tests are also utilised to ascertain goodness of fit (Cox & Snel1, 1989; Nagelkerke, 1991)

2.5.3.3 Moderated Regression Analysis

It is hypothesised that a relationship between two variables can be affected by the level of a third variable known as a moderator (i.e., the interaction term between IV and moderator) (Cohen et al., 2003), as opposed to hierarchal multiple regression, within hierarchical moderated regression (MRA) the type of sequencing specifies that all IV's are entered first (the first step in the regression model) and then the interaction terms (second step).

Prior to conducting a moderated regression analysis centering is usually used, in order to observe the independent effect of IV's from the interaction terms. Both the IV and moderator are centered around the respective sample means, to reduce/eliminate the problem of multicollinearity. In moderated regression and hierarchal moderated regression, simple slope computations vary depending on the interaction term between the predictor variable and moderator. With continuous moderators the moderating effects are further investigated by comparing the simple slope computations for "high" levels of the moderator (1 SD above the M) and "low" levels of the moderator (1 SD below the M), it is imperative to plot the interactions in order to correctly interpret them (Boduszek et al., 2014; Boduszek et al. 2012; Cohen et al., 2003).

2.5.4 Latent Profile Analysis

Latent Class Modelling (LCM) relates to a set of observed multivariate variables to a set of latent variables and is a type of Latent Variable Model. Latent Class Analysis (LCA; Goodman, 1974; Lazarsfeld & Henry, 1968) is a subset of Structural Equation Modelling (SEM) and is a statistical procedure that is used to classify individuals into homogenous subgroups (latent classes). LCA is differentiated from Latent Profile Analysis (LPA) by the use of categorical data in LCA and the use of continuous data in LPA. Due to the nature of the continuous data utilised in this thesis, LPA was used (please see chapter 4).

LPA attempts to detect the presence of latent classes and create patterns of association as with factor analysis. LPA can be used to classify cases according to their maximum likelihood class membership. The overarching criteria solution to achieve latent classes in which there is no longer any association of one set of items with another, and the overall set of items that are measured, therefore, the items will become conditionally independent i.e. they are no longer related. The starting point for the classification is the observed response patterns of individuals scores across a set of continuous questionnaire items. In a LPA the relationships between the items are explained by the presence of latent classes, in other words individual differences in observed item response patterns are explained by differences in latent class membership, where each class shows a characteristic, class specific response profile (Geiser, 2013). The overall goals of LPA are to, firstly determine the number of classes necessary to explain the differences in the observed response patterns and summarise this data in a meaningful way (exploratory LPA) the model should use as fewer latent classes as possible to explain the data. Secondly to examine what differentiates each particular class, and to test hypotheses about typological structures (confirmatory LPA). Thirdly evaluation of the reliability of the classification based on the specific LPA solution should be undertaken. Fourthly to determine the most likely latent class membership of one or more individuals for diagnostic purposes, and lastly to analyse relationships between class memberships and external variables. The general practice of LPA is to test the fit of a two-class model and systematically increase the number of classes until adding more classes is no longer warranted. Several evaluations are carried out to determine this; robust maximum likelihood (Yuan & Bentler, 2000), the Akaike Information Criterion (AIC; Akaike, 1987), the Bayesian Information Criterion (BIC; Schwarz, 1978), and sample size adjusted Bayesian Information Criterion (SSA-BIC; Sclove, 1987). Ultimately the model with the lowest value indicates the best latent profile solution. A significant value ($p < 0.05$) indicates that the specified model provides a better fit to the data relative to the model with one less class, this is repeated until a non- significant value ($p > 0.05$) indicates that the model with one less class should be accepted as the final solution.

2.6 SOFTWARE

2.6.1 Statistical Package for the Social Sciences (SPSS)

The Statistical Package for the Social Sciences (SPSS) is a comprehensive computer software program used to analyse data (SPSS, 2004) and is widely used throughout the social science disciplines. SPSS analyses data from virtually any file type and can utilise it to produce a number of outputs, including but not limited to, descriptive statistics, distribution plots, graphs, and complex statistical analyses (SPSS, 2004). In its primary function of statistical analysis and reporting, it addresses the entirety of the analytical process, from planning to data collection, analysis, reporting, and deployment (IBM, 2016). IBM SPSS advanced statistics also provides both univariate and multivariate modelling methods when utilising data describing complex relationships. These further sophisticated analytical methods enable much deeper analysis of the data. SPSS was used in the present research to conduct a number of analyses, Pearson correlation, T-Tests, ANOVA, Multiple Regression, Moderated Regression and Multinomial Logistic Regression Analyses.

2.6.2 Mplus

Mplus developed by Muthén & Muthén, (1998–2011) is an advanced comprehensive computer software program used to analyse data in conjunction with SPSS. The following is a comprehensive account provided by Muthén & Muthén (Statmodel, 2019) of the capabilities of Mplus.

"Mplus offers researchers a wide choice of models, estimators, and algorithms. Mplus allows the analysis of both cross-sectional and longitudinal data, single-level and multilevel data, and data that comes from different populations with either observed or unobserved heterogeneity, and data that contain missing values. Analyses can be carried out for observed variables that are continuous, censored, binary, ordered categorical (ordinal), unordered categorical (nominal), counts, or combinations of these variable types. The Mplus modelling framework draws on the unifying theme of latent variables. The generality of the Mplus modelling framework comes from the unique use of both continuous and categorical latent variables. Continuous latent variables are used to represent factors corresponding to unobserved constructs, random effects corresponding to individual differences in development, random effects corresponding to variation in coefficients across groups in hierarchical data, and latent response variable values corresponding to missing data. Categorical latent variables

are used to represent latent classes corresponding to homogeneous groups of individuals, latent trajectory classes corresponding to types of development in unobserved populations, mixture components corresponding to finite mixtures of unobserved populations, and latent response variable categories corresponding to missing data" (Statmodel, 2019).

Mplus was utilised in the present research to conduct a number of analyses namely, Confirmatory Factor Analysis and Latent Profile Analysis.

2.6.3 ModGraph

ModGraph developed by Jose (2013) provides a way to plot interactions in an uncomplicated and simple manner because SPSS does not provide a means to do this for moderated regression analysis.

"The program allows one to enter statistical information obtained from multiple regression output in order to compute the equations that yield cell means necessary for the graphical display of statistical interactions. This application is designed to ease the process of creating two types of figures frequently used by researchers to display statistical interactions. The two types of figures are for a Continuous Moderator (3 x 3 table) and for a Categorical Moderator (3 X 2 table, where the second term designates two levels of a categorical variable)" Jose (2013).

ModGraph creates a downloadable .jpeg fle, in order to modify this further an excel based ModGraph program can be used to provide titles, labels etc. Figures created using ModGraph allow a visual interpretation of the obtained statistical interactions that provide enhanced clarity. ModGraph 3.0 (Jose, 2013) was utilised in the current thesis (please see results in Chapter 5 for examples of figures devised using ModGraph).

2.6.4 Qualtrics Survey Software

Qualtrics is a research software programme, operated by a private company based in Provo, Utah, founded in 2002. "Qualtrics software enables users to do many kinds of online data collection and analysis including market research, customer satisfaction and loyalty, product and concept testing, employee evaluations and website feedback" (Qualtrics, 2019). In view of the current research it allowed the lead researcher to create the survey, in the format of an information sheet, consent form and the required survey scales along with debrief information. It also allowed the user to securely transfer all information into SPSS statistical software for the data analysis. Therefore, negating the requirement to store any hardcopies in paper format of any transcribed materials. "Qualtrics provides a confidential system component

design. It uses multiple checks to certify that packets from one subsystem can only be received by a designated subsystem. Access to systems is severely restricted to specific individuals, whose access is monitored and audited for compliance. Customer data are stored in a specific location; it does not float around in the "cloud." In addition, all data are processed in that location, and are not moved to another jurisdictional area. In other words, if data is collected in the UK. all data is processed in the UK. Qualtrics uses Transport Layer Security (TLS) encryption (also known as HTTPS) for all transmitted data. It also protects surveys with passwords and HTTP referrer checking. The service is hosted by trusted data centres that are independently audited using the industry standard SSAE-16 method. Qualtrics deploys the general requirements set forth by many Federal Acts, including the FISMA Act of 2002. Qualtrics subscribers control their users and their data, therefore it is important for the user to practice sound security practices by using strong account passwords and restricting access to their accounts to authorized persons" (Qualtrics, 2019).

CHAPTER THREE:

Introduction and Psychometric Validation of the Prison Personnel Trauma Measure (PPTM)

Part of this chapter has been published in the *European Journal of Trauma and Dissociation* Woodfield, R., Boduszek, D. & Willmott, D. (2018). Introduction and Psychometric Validation of the Prison Personnel Trauma Measure, *European Journal of Trauma and Dissociation.* DOI: 10.1016/j.ejtd.2018.04.005 (ISSN 2468-7499).

Abstract

Objective: The aim of this chapter was to create and validate a brief self-report measure of trauma exposure specific to personnel employed within a prison environment which exhibits predictive validity for a number of adverse psychological conditions shown to be a consequence of working within such prison environments.

Method: The Prison Personnel Trauma Measure (PPTM), Hospital Anxiety and Depression Scale (HADS), and the Posttraumatic Stress Disorder Checklist – Civilian Version (PCL-C) were administered to 1995 Prison Personnel in England and Wales. Dimensionality and construct validity of the PPTM were investigated using confirmatory factor analysis. Two alternative models of the PPTM were specified and tested using Mplus with WLSMV estimation.

Results: The three-factor model of the PPTM offered the best representation of the data. The results suggest that the PPTM consists of three sub scales: self-harm/death, violent, and environmental. Good composite reliability and differential predictive validity were observed.

Conclusion: This brief measure can be used to ascertain potential vulnerability to the subsequent development of adverse psychological symptoms (PTSD, Anxiety, and Depression) amongst prison personnel for specific trauma related experiences that are known to be an inherent part of certain occupational roles within a prison environment.

3.1 INTRODUCTION

Findings from research conducted across numerous countries suggest that working in a prison environment can induce both stress and trauma. UK research (Johnson et al., 2005; Kinman et al., 2014) has found that prison officers report poorer physical and psychological health than other occupational groups. In the course of performing their duties, prison staff, and in particular PO's, are often exposed, directly and indirectly, to incidents involving violence, injury, and sometimes death (Konda et al., 2013). Commonly reported incidents include being physically assaulted, witnessing attempted or completed suicides, being threatened with physical harm, witnessing assaults, riots, or arson, or learning disturbing details about offenders' crimes on a recurrent basis over their careers (Denhof & Spinaris, 2016).

Spinaris et al. (2012) reported that United States corrections professionals had experienced an average of 28 exposures to violence, injury and death events over a five-year period in their careers, involving potentially traumatic events of five different types. Experiencing violence and aggression, from prisoners has been highlighted as a particularly acute source of stress for PO's. Labour statistics from the US indicate that PO's have a considerably greater risk of non-fatal "on-the-job" injuries than other occupational groups (Kunst, 2011). Official reports from prisons in England and Wales (Ministry of Justice, 2017) show levels of violence, self-harm incidents and suicide to be the highest on record, with these increasing further still in 2018 (Ministry of Justice, 2018). In the US from 1999 to 2008, there were 113 confirmed work-related fatalities among PO's (Konda et al., 2013), assaults, violent acts and transportation-related fatalities accounted for 80 percent of all fatalities; among fatal assaults and violent acts, 62 percent were due to homicides and 38 percent were due to suicides by self-inflicted gunshot wounds; and of the homicides, 65 percent were committed by inmates.

Whilst prison related occupations have not received comparable research attention, it is evident that prison staff are exposed to many of the same or similar work-related traumatic events as police officers, firefighters and military personnel (Perrin et al., 2007; Corneil et al., 1999; Fulton et al., 2015, as cited in Denhof & Spinaris, 2016). Prison Personnel are directly exposed to events involving violence injury, or death as well as repetitive indirect exposure as part of one's job role, which has been shown to have cumulative and deleterious effects upon their health and functioning within US corrections facilities (APA, 2013; Bureau of Labor Statistics, 2015; Denhof & Spinaris, 2013; Denhof et al., 2014; Konda et al., 2013; Spinaris et

al., 2012; Stadnyk, 2003). Given that current findings indicate high levels of exposure to traumatic events within prison personnel, it is plausible that this population likely experiences similar elevated rates of stress-related health conditions, such as PTSD and/or depression, anxiety and other deleterious mental health symptomology (Denhof & Spinaris, 2014). Research studies support a link between exposure to violence, injury and death and prison personnel's mental and physical health status of various types (Denhof & Spinaris, 2013; Spinaris et al., 2012; Stadnyk, 2003), and as such greater exposure is frequently associated with decreased health status. Rates of depression and post-traumatic stress disorder amongst US prison personnel far exceed those of the US general population, Denhof & Spinaris (2013). Research by Boudoukha et al. (2013) with French PO's found they demonstrated high levels of PTSD symptoms, burnout, and stress, with violent interactions with inmates leading to experienced trauma of all types (PTSD, secondary, or vicarious trauma). Whilst a variety of health-related consequences have been linked to traumatic exposure in prison settings, Denhof and Spinaris (2013) have highlighted that the presence of comorbid depression and PTSD appears to be particularly consequential compared to either depression or PTSD. Prison personnel with comorbid status demonstrated higher adverse symptoms than did prison staff with either PTSD or depression alone.

Several self-report general and context specific trauma measures have been developed over the past 25 years including the Brief Trauma Questionnaire (BTQ: Schnurr et al., 1999), Life Events Checklist for DSM-5 (LEC-5: Weathers et al., 2013), Life Events Screening Questionnaire (SLESQ: Goodman et al., 1998), Traumatic Life Events Questionnaire (TLEQ: Kubany et al., 2000) and the Trauma History Screen (THS: Carlson et al., 2011) which seek to measure lifetime trauma history. However, most measures do not assess whether events were associated with significant or lasting psychological distress and as such further assessment measures and/or clinical diagnoses are often used to assess lasting psychological harm. Despite numerous studies surrounding the adverse outcomes of traumatic exposure in risk associated occupations (Perrin et al., 2007; Corneil et al., 1999; Fulton et al., 2015; Gates et al., 2012) there is a need for context specific measures of trauma exposure and PTSD in specified populations (Stover & Berkowitz, 2005, O'Hare et al., 2013). Isolating context specific trauma exposures from general life history trauma events can help identify and establish relevant problem exposures that may contain differential symptomology and comorbidity. A small number of context specific measures of trauma have been developed to address the need for specified populations, The Critical Incident History Questionnaire (CIQH: Weiss et al., 2010)

indexes cumulative exposure to traumatic incidents in police officers; The Combat Exposure Scale (CES: Keane et al., 1989); and the Deployment Risk and Resilience Inventory (DRRI: King et al., 2006) for military personnel. The Violence Injury and Death Exposure Scale (VIDES: Denhof & Spinaris, 2014) is a 12 item measure intended for commercial purposes and use in organisations where exposure to violence or death may be consequential and which has been psychometrically validated in U.S prison personnel (Denhof & Spinaris, 2013, 2014) showing predictive validity for PTSD, Anxiety and Depression. Despite this, the VIDES scale has been critiqued for its use as a context specific instrument to measure trauma exposure. Firstly, the VIDES has so far never been peer reviewed or published in an appropriate journal. Secondly, the VIDES was intended for commercial purposes i.e. financial gain and has been marketed to be used amongst law enforcement agencies and similar trauma exposed occupations generically as opposed to specifically amongst prison personnel. Lastly some of the specific items on the VIDES although measuring direct potential trauma exposure variables such as the witnessing of violence, suicide and exposure to assault, it does not measure variables that are intrinsic to the context of working within a prison environment specifically. Furthermore the VIDES utilises four items that measure hearing about variables such as violence and death which although potentially problematic factors within a working environment do not map directly onto diagnostic criteria variables for PTSD (DSM-5; APA, 2013) that said these variables maybe potentially problematic in the development of Anxiety and Depression disorders and further research warrants the isolating of specific variables such as these and potential correlations.

Despite the utility of the above-mentioned measures to date, their remains shortcomings in their specific utility for use as a prison context specific instrument. The advantage of developing such context specific measures are apparent in the specific situational, cultural, organisational, and occupational populations that they target to assess. Isolating context specific trauma exposure from general life history trauma events, helps establish the essential differentiation between the two situational exposures and ascertain both magnitude and frequency within specified populations and individuals, thus enabling more detailed post trauma treatment diagnosis and strategies. Such measures may also enable clinicians and researchers with vested interests, to better ascertain where and which exposures to potentially traumatic events may be problematic within the working environment and how repeated exposure to specific traumas may lead to adverse psychological outcomes, chronic maladaptation, and other negative health related outcomes.

3.1.1 The current study

Despite a large body of literature pertaining to trauma exposure measures in existence, to date there remains a lack of context specific measures available for prison occupational cohorts where exposure to hostility, isolation, violence, injury, and death is a matter of routine. Considering the suggestions that generalised measures of trauma exposure do not effectively encapsulate unique cohorts with potentially different sub symptomology (Stover & Berkowitz, 2005; O'Hare et al., 2013) and more focused measures (VIDES: Denhof & Spinaris, 2014) are inadequate to fully encapsulate the unique exposures prison personnel may face, the aim of the current study was to develop and validate the Prison Personnel Trauma Measure (PPTM) and show differential predictive validity for the subsequent development of PTSD, Depression, and Anxiety in varying categories of prison establishments and gender.

3.2 METHOD

3.2.1 Participants and Procedure

A total of *N* =1995 prison personnel responded and returned completed surveys. Due to some of the returned surveys having significant missing data *N* = 1562 respondents were included in the final analysis. The sample consisted of *n* = 948 male and *n* = 614 female participants (for full description of the sample and sampling procedures please see Chapter 2 Methodology, Section 2.2 and Sub Section 2.2.4)

3.2.2 Measures

The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983); The Posttraumatic Stress Disorder Checklist – Civilian Version (PCL-C; Weathers et al., 1994); Prison Personnel Trauma Measure were administered to all participants (for full description of the measures utilised please see Chapter 2 Methodology, Section 2.3 and Sub Section 2.3.1 to 2.3.4).

3.2.3 Scale Development

The Prison Personnel Trauma Measure (PPTM) – was developed for the purpose of the current study to assess occupational trauma exposure within prison settings. Item generation for the PPTM relied on theoretical notion based on original conceptualizations of trauma exposure (APA, 2000, 2013) as well as the most recent research findings in the area of prison personnel based trauma exposure (Konda et al., 2013; Schlosser et al., 2010; Spinaris et al., 2012; Boudoukha et al., 2013) and discussions with a panel of experts (criminal/forensic and health psychologists and a research methodologist). Expert opinion was also sought from further discussions with numerous serving prison personnel of varying grades and functions within prison establishments.

The intention in the development of the PPTM was that it should be used primarily in research to record the amount of potentially traumatic experiences personnel have been subjected too and then further tested for predictive validity for potentially adverse psychological outcomes. The primary purpose and aim in the development of the PPTM therefore was to create a measure that identified and recorded individual personnel's exposure to the potentially harmful occupational factors of prison work as opposed to organisational factors. In this sense the distinction used to separate these factors were that occupational

stressors are deemed to be a consequence of working with the management and incarceration of prison populations with distinct similarities within the occupational role regardless of country, these stressors include but are not limited to, risk of assaults, intimidation, physical and psychological abuse for example. This is in contrast to organisational stressors that may occur as a consequence of the cultural, organizational and political factors that differentiate the detainment and management of prisoners in different countries.

In considering the literature surrounding prison personnel it is evident that there is significant disparity and lack of cohesion. It is also clear that a variety of factors both occupational and organizational are apparent in the development of potentially adverse outcomes for prison personnel. As such it is difficult to compartmentalise specific stressor related concepts as attributable solely to organizational or occupational stressors alone without providing a measure that isolates the variables of both entities in order to provide this clarity.

The development of the PPTM therefore relied on the theoretical notion that in order to correctly and fluently measure potentially problematic factors, firstly organizational and occupational stressors should initially be separated to enable the measurement of occupational factors before considering either a) the measurement of organizational factors or b) controlling for organizational factors during subsequent analysis to identify potential correlations with factors of the sociological environment of particular prisons or prison systems, factors such as, but not limited to; managerial practices, staffing levels, resource and income etc. that could potentially exacerbate problematic occupational factors, the full scope of achieving this was beyond the range of the current thesis but would assist in providing direction for future research (see Conclusion chapter, Future directions).

In the initial phase of the development a panel of experts was assembled including, a criminal and forensic psychologist, a health psychologist and a research methodologist (statistician) chosen for the purpose of advising the primary researcher on theoretical aspects, practicalities of scale development and potential typologies of adverse symptomology outcomes. Alongside this expert opinion was also sought through discussion with several serving prison personnel including, Prison Officer, Supervising Officer and Custodial Manager ranks as well as Governor grades, from various categories and typology of prison.

A blueprint or test specification was initially developed to provide a framework for developing the questionnaire by structuring content areas with manifestations (ways in which

the content areas may become manifest) along a horizontal and vertical axis on a grid formation as the recommended methodology for questionnaire development (Rust & Golombok, 2014).

Varying ideas surrounding the constitution of potentially traumatic experiences posed a problem, for this reason the expertise of serving prison personnel was initially sought. The personnel were asked to identify areas that they considered potentially stressful in their work. The items were then sub divided into the two areas of occupational and organizational factors as per the requisites outlined and why the expertise of prison personnel with predominately high daily contact with prisoners was sought as well as personnel with a direct responsibility for managing such staff. After identification and separation of both factors consultation with academic experts then took place to confirm the factors were correctly separated. Further discussion was then carried out with prison personnel to focus on the occupational items that were identified. They were asked to rate these in order of what they felt were more likely to occur in their particular roles as well as try to ascertain what items may occur through direct exposure (defined as being subjected to or involved in) and indirect exposure (witnessing). Items were cast to reflect specific trauma exposure prison personnel may be subjected to based on these two dimensions with particular reference to violence exposure and death, Again, confirmation and agreed consensus with academic experts then took place. Further to this discussions centred on items that would meet criterion A standards for DSM-5 criteria for trauma exposure in order to map onto the most up to date version of The Diagnostic and Statistical Manual of Mental Disorders (DSM-5; APA, 2013) however, in the current study PTSD symptomology was measured using the older PCL-C (Weathers et al., 1994) meeting criterion A standards set for DSM - IV (APA, 2000) as opposed to the newer PCL – 5 (Weathers et al., 2013) for DSM - 5 (APA, 2013) it was felt the quality of measurement characteristics of the PCL – C (Blanchard et al., 1996; Orsillo, 2001; Ruggiero et al., 2003) and its diagnostic utility, well substantiated and established findings (Bertelson et al., 2011; Gardner et al., 2012; Keen et al., 2008; McDonald & Calhoun, 2010) would provide a robust measurement of any subsequent findings in the validation of the PPTM. Further to this items were also considered that could also potentially correlate with adverse psychological symptomology such as helplessness and hopelessness which may be exacerbated by long periods working isolated with prisoners, with low visibility to colleagues.

The generation of items also involved consideration of their number as too many would possibly mean long periods of time to complete a lengthy inventory, possibly meaning poor response rates and quality and that items may be omitted. However, a sufficient number was

also required to ensure high reliability. As stated by Rust and Golombok (2014) a minimum of twelve items per scale is usually required to achieve adequate reliability with higher numbers ideally twenty plus pooled initially prior to pilot testing and this corresponded with the intention that the PPTM was to be used as a short questionnaire to encapsulate the more common and frequent occupational factors as opposed to all eventualities prison personnel may encounter whilst undertaking their duties. After agreed consensus Nineteen items were assembled and indexed.

Further to the process of generation and extraction of items the writing of the finalised items was then considered. As varying item types are suitable for different purposes consideration of the attribute or characteristic that the PPTM was to measure was discussed with academic experts. As the PPTM was to be used primarily as a research measure of occupational incidents it was felt a rating scale on a continuum should be used as opposed to an alternate choice or multiple-choice scale. Although rating-scale items are similar to multiple-choice items in giving several response options, the options in rating scales are ranked whereas multiple-choice item options are independent of each other. Further to this rating scale items allow respondents to be able to express themselves more precisely than with alternate-choice items. However, some disadvantages to rating scales are that respondents can differ in their interpretations of the response options, e.g. 'frequently' has a different meaning to different individuals. Some respondents tend always to choose the most extreme options. When an uneven number of response options is used, many respondents tend to choose the middle one, e.g. 'don't know', or 'occasionally'. To counteract this effect a numbered rating scale was chosen to allow respondents to accurately report a figure based on their experiences thus negating the need for subjective interpretation. Furthermore, a sufficient number of options is required for respondents to be able to express themselves adequately while ensuring that they are not too numerous to have to make discriminations. In questionnaires using rating-scale items where strength of response should be reflected in the respondent's score, it is usual for at least four options to be used (Rust & Golombok, 2014).

At this stage further discussion took place with Prison Personnel to ascertain amounts that personnel may possibly be exposed to over their careers. In consideration of this a rating based on on a four-point Likert scale was chosen, A frequency range of 'never', '1 to 10 times', '11 to 20 times', to '21 or more times', 'never' reflected an absolute zero point for no exposure, '1 to 10 times' was deemed as the most appropriate range for inexperienced members of staff particularly with less than one year of experience which at the time of data collection was

appropriate to reflect higher percentages of inexperienced staff (less years of service) that were currently employed due to several restructuring strategies implemented by HMPPS, as well as staff whose roles or current prison establishment category could possibly entail lower exposure to incidents.. The '11 to 20 times' rating would encapsulate a mid – range of the three considerations (experience, role and prison establishment category) and '21 or more times' the highest end of the rating spectrum. Following development further consultation was sought from academic experts and corroborated the four-point Likert scale. Consideration was also given to the fact that some of items on the PPTM would / could theoretically occur to a larger and more frequent extent than others, however the impact of this would later be confirmed with the appropriate statistical methods as testing would seek to test the factor loadings of the items on the measured outcome of exposure as well as their predicative validity for adverse symptomology.

The assembled nineteen items of the PPTM were grouped into factors, this would allow for the theoretical testing at the later analysis stage of whether the PPTM items should load onto a single measure of trauma exposure or several factors. The grouping factors and items within them were chosen to reflect their similarities. Five initial factors were formulated, exposure to Death and Self-Harm, Violence, Environmental Exposure, Vicarious Trauma and a Miscellaneous factor. Each factor contained items that related either to direct or indirect exposure or both. Exposure to Violence (8 items with 5 measuring direct exposure and 3 indirect exposure) consisted of; 1. Have you ever been threatened physically by a prisoner; 2. Have you ever been physically assaulted by a prisoner; 3. Have you ever been verbally abused by a prisoner; 4. Have you ever been subjected to passive aggression i.e. intimidation; 5. Have you ever witnessed prisoner on prisoner violence; 6. Have you ever witnessed prisoner on staff violence; 7. Have you ever witnessed staff on prisoner violence; 8. Have you ever been subjected to an assault with excrement by a prisoner. Environmental Exposure (4 items measuring direct exposure) consisted of; 1. Have you ever worked completely isolated from other staff for long periods of time with prisoners; 2. Have you ever worked on poorly designed wings i.e. narrow corridors, blind spots; 3. Have you ever worked in dirty protest conditions (where prisoner has smeared excrement around their cells etc.); 4. Have you ever been involved in a cell fire extraction (removed a prisoner from a burning cell). Exposure to Death and Self-Harm (3 items measuring direct exposure) consisted of; 1. Have you ever witnessed self-harm behaviour by a prisoner; 2. Have you ever witnessed suicide attempts by a prisoner; 3. Have you ever witnessed the death of a prisoner or colleague. Vicarious Trauma (1 item measuring

direct exposure) consisted of; 1. Have you ever worked on SOTP (sex offender treatment programmes) courses or similar. Miscellaneous factor (3 items measuring direct exposure) consisted of; 1. Have you ever suffered a needle stick injury whilst searching a prisoner / prisoner's accommodation; 2. Have you ever had a false allegation made against you by a prisoner (which led to an official investigation); 3. Have you ever been sent on compulsory detached duty.

The layout and instructions to the PPTM were designed to provide clarity and clear understanding of the requirements for its completion with simplicity of administration in mind. Participants were asked 'In your current role have you ever__ (choice item from above) __'? and simply asked to record the frequency of the item under each of the four rating scale categories. All of the items were scored from low to high with no requirement for any of the items to be reversed scored, to ascertain levels of trauma exposure to occupational factors.

A pilot study was conducted on a convenience sample of $N = 50$ prison personnel via the same methodological approach as the primary study would entail (see methodology section, data collection). This was in order to test not only the PPTM, but the procedural methods involved in the overall study. The pilot sample was utilised from the lead researchers prison establishment where they were serving at the time of data collection. The pilot sample consisted of $n = 20$ male and $n = 30$ female participants. Their age ranged from 22 to 65 years ($M = 39.12$, $SD = 8.56$) and reported length of prison work experience ranged from 1 to 33 years ($M = 18.22$, $SD = 9.67$). Thirty-two ($n = 32$) of the participants were prison officers, $n = 8$ supervising officers, $n = 3$ custodial managers and governor grades, and $n = 7$ operational support grades.

After pilot study results indicated a good disparity of findings, further analysis of the items demonstrated consistency amongst each other with the outcome variable of trauma, as well as the items ability to discriminate amongst respondents. Given that items should only be selected for the final version of the questionnaire if they measure the same knowledge or characteristic as the other items in the questionnaire (Rust & Golombok, 2014) it was felt appropriate at this stage to administer the full nineteen items of the scale to the larger participant sample.

Following collection of the larger data set from amongst the participant sample preliminary analytical results using factor analysis revealed four of the nineteen items had significantly low standardised factor loadings (below desirable threshold .40 and accepted cut

off threshold .33; Comery & Lee, 1992) worked on SOTP [sex offender treatment programmes] or similar; been sent on compulsory detached duty, had a false allegation made against you by a prisoner, suffered a needle stick injury whilst searching a prisoner / prisoners accommodation. Furthermore, the miscellaneous and vicarious trauma factor also displayed significantly low composite reliability (below accepted threshold .60; Raykov, 1997). On the basis of this and further consultations with the panel of experts, the initial item pool was reduced to 15 items (see Table 3.3) with 3 factors: Death and Self-Harm (3 items measuring direct exposure), Violent (8 items with 5 measuring direct exposure and 3 indirect exposure), and Environmental (4 items measuring direct exposure) trauma exposure. It was decided that to remove the factor measuring Vicarious Trauma (worked on SOTP [sex offender treatment programmes] or similar) as it was deemed ineffective to measure this solely with one item was acceptable. Also the Miscellaneous factor was also removed containing 3 items (been sent on compulsory detached duty, had a false allegation made against you by a prisoner, suffered a needle stick injury whilst searching a prisoner / prisoners accommodation) as it was decided after consultation that these factors would likely lead to prolonged experience of stress and possible related outcomes of Anxiety and Depression as opposed to the development of trauma related illness such as PTSD and ASD (Acute Stress Disorder). Following this development, the finalised fifteen items of the scale using a one factor and three factor solution were tested for construct validity and dimensionality as well as predictive validity using the techniques outlined in the following section.

3.2.4 Analytical Procedures

Construct validity and dimensionality of the PPTM was investigated through the use of traditional confirmatory factor analysis techniques. Two models of the latent factor structure of the PPTM were specified and tested using Mplus version 7.11 (Muthén & Muthén, 1998–2011) with weighted least squares means and variance adjusted (WLSMV) estimation. Model 1 is a one-factor solution in which all 15 PPTM items load on a single latent factor of Trauma. Model 2 is a correlated three-factor solution where items load on a death/self-harm exposure factor (items 13, 14 and 15) environment exposure factor (items 9, 10, 11 and 12) and a violent exposure factor (items 1, 2, 3, 4, 5, 6, 7 and 8). The overall fit of each model and the relative fit between models were assessed using a range of goodness-of-fit statistics: the χ^2 statistic, the Comparative Fit Index (CFI; Kline, 2010), and the Tucker Lewis Index (TLI; Tucker & Lewis, 1973). For CFI and TLI, values above 0.95 indicate good model fit (Bentler, 1990; Hu & Bentler, 1999). In addition, the Root Mean Square Error of Approximation (RMSEA; Steiger,

1990) with 90% confidence interval is presented. Ideally, this index should be less than 0.05 to suggest good fit (Bentler, 1990; Hu & Bentler, 1999) however values less than 0.08 suggest sufficient fit. Furthermore, the Weighted Root Mean Square Residual (WRMR) was used to evaluate the two models, with the smallest value indicating the best fitting model. Composite reliability was calculated based on formula provided by Raykov (1997; values above .6 represent good internal reliability). Multiple regression analysis was performed to establish differential predictive validity of three-factorial PPTM.

3.3 RESULTS

Descriptive statistics (*M* and *SD*) for the three PPTM factors (Self-Harm/Death, Violent, and Environmental), Total Trauma, PTSD, Anxiety, and Depression are reported in Table 3.1. Additionally, Table 3.1 presents results from a series of t-tests (differences between male and female prison officers) and ANOVAs (differences between 3 levels of prison security) for all continuous variables. The results show statistically significant differences on all factors of the PPTM for males and females and three levels of security therefore, construct validity and dimensionality were conducted on full sample and based on specific subgroups.

Table 3.1 Descriptive statistics for PPTM factors, PTSD, Depression and Anxiety.

Variable	M (SD) Observed values min-max / Full sample	M (SD) Males	M (SD) Females	t-value (Cohen's d)	M (SD) Category A	M (SD) Category B	M (SD) Category C	F-ratio (Cohen's d)
Self-Harm/Death	7.58 (1.88) 3 - 12	7.73 (1.77)	7.34 (2.02)	3.86*** (.20)	7.20 (1.99)	7.84 (1.87)	7.56 (1.74)	11.08*** (A<B = .33; A<C = .19 B>C = .16)
Violent	21.24 (4.24) 8 - 32	21.88 (3.91)	20.27 (4.54)	7.45*** (.38)	20.10 (4.66)	21.90 (4.04)	21.30 (3.96)	16.72*** (A<B = .41; A<C = .28; B>C = .15)
Environmental	9.76 (2.58) 4 - 16	10.14 (2.47)	9.17 (2.64)	7.37*** (.38)	9.17 (2.57)	10.04 (2.61)	9.79 (2.36)	10.19*** (A<B = .34; A<C = .25)
Total Trauma	38.58 (7.53) 15 - 60	39.75 (6.95)	36.79 (8.03)	7.51*** (.39)	36.47 (8.00)	39.78 (7.38)	38.65 (6.83)	18.00*** (A<B = .43; A<C = .29; B>C = .16)
PTSD	44.67 (17.52) 17 - 85	45.69 (17.69)	43.12 (17.15)	2.77** (.15)	43.49 (18.44)	45.85 (17.26)	45.22 (17.51)	1.50
Anxiety	18.49 (4.46) 7 - 28	18.39 (4.44)	18.64 (4.50)	-1.01	17.80 (4.60)	19.03 (4.29)	18.46 (4.41)	7.31*** (A<B = .28)
Depression	15.32 (4.27) 7-28	15.55 (4.31)	14.95 (4.19)	2.70** (.14)	14.88 (4.52)	15.64 (4.13)	15.39 (4.28)	2.76

Note: * $p < .05$; ** $p < .01$; *** $p < .001$. Category A, B, and C denotes security classification of prison with A being highest (maximum security)

As suggested by Boduszek and Debowska (2016) it is unacceptable to assume that only one model exists for a particular scale, suggesting that competing solutions ought to be tested in order to fully explore the dimensionality of any measure. As per those recommendations, two different conceptually sound models of the PPTM (unidimensional and three-dimensional) were tested using confirmatory factor techniques. Fit indices for both models of the PPTM for full sample, males, females, and three levels of security (A, B, and C) are presented in Table 3.2. In terms of analysis with a full sample and all subgroups, the one factor model offers reasonably acceptable fit based on the CFI, TLI, and RMSEA statistics. However, the three-factor model of the PPTM provides a superior fit to the data based on all statistics for the full sample and all subgroups. Therefore, the three-factorial solution is preferential.

Table 3.2 Fit indices for two alternative models of the PPTM.

Sample	Model	χ^2 (df)	CFI	TLI	RMSEA (90%CI)	WRMR
Full sample	1 factor	1155.39 (90)	.943	.933	.087 (.083/.092)	2.264
	3 factor	720.71 (87)	.966	.959	.068 (.064/.073)	1.756
Males	1 factor	678.87 (90)	.937	.926	.083 (.077/.089)	1.775
	3 factor	493.28 (87)	.956	.947	.070 (.064/.076)	1.487
Females	1 factor	535.74 (90)	.950	.941	.090 (.083/.097)	1.569
	3 factor	307.58 (87)	.975	.970	.064 (.057/.072)	1.156
Category A	1 factor	258.60 (90)	.949	.941	.090 (.077/.103)	1.113
	3 factor	202.35 (87)	.965	.958	.076 (.062/.090)	0.959
Category B	1 factor	488.40 (90)	.946	.937	.081 (.074/.088)	1.523
	3 factor	359.32 (87)	.963	.955	.068 (.061/.075)	1.282
Category C	1 factor	368.47 (90)	.947	.938	.079 (.071/.088)	1.316
	3 factor	252.45 (87)	.968	.962	.062 (.053/.071)	1.062

Further value of three-factorial solution was examined via standardised factor loading statistics and composite reliability. Table 3.3 presents standardised factor loadings for the three-factor solution for the full sample and all subgroups. All items displayed statistically significant factor loadings ($p < .001$). Composite reliability was .82 for the Self-Harm/Death factor, .90 for the Violence factor, and .66 for the Environment factor.

Table 3.3 Standardised factor loadings for the three PPTM factors (Full sample, Males, Females, Category A, B and C Prisons).

Item	Full	Males	Females	A	B	C
1. Have you ever been threatened physically by a prisoner	.83	.83	.82	.84	.81	.82
2. Have you ever been physically assaulted by a prisoner	.75	.72	.79	.84	.73	.71
3. Have you ever been verbally abused by a prisoner	.85	.80	.91	.86	.80	.84
4. Have you ever been subjected to passive aggression i.e. intimidation	.74	.69	.81	.77	.74	.75
5. Have you ever witnessed prisoner on prisoner violence	.81	.81	.81	.78	.83	.78
6. Have you ever witnessed prisoner on staff violence	.82	.84	.80	.86	.81	.80
7. Have you ever witnessed staff on prisoner violence	.40	.37	.46	.39	.44	.32
8. Have you ever been subjected to an assault with excrement by a prisoner	.55	.50	.59	.63	.51	.51
9. Have you ever worked completely isolated from other staff for long periods of time with prisoners	.37	.33	.40	.39	.37	.31
10. Have you ever worked on poorly designed wings i.e. narrow corridors, blind spots	.50	.47	.52	.35	.50	.55
11. Have you ever worked in dirty protest conditions (where prisoner has smeared excrement around their cells etc.)	.71	.68	.72	.69	.74	.70
12. Have you ever been involved in a cell fire extraction (removed a prisoner from a burning cell)	.67	.61	.73	.68	.68	.62
13. Have you ever witnessed self-harm behaviour by a prisoner	.91	.91	.93	.87	.91	.91
14. Have you ever witnessed suicide attempts by a prisoner	.81	.80	.83	.87	.80	.76
15. Have you ever witnessed the death of a prisoner or colleague	.59	.57	.60	.65	.69	.45

All factor loadings are statistically significant at $p < .001$. Category A, B, and C denotes security classification of prison with A being highest (maximum security).

Correlations between the three factors of the PPTM were statistically significant with a large effect size (Self-Harm/Death with Violent = .78, $p < .001$; Self-Harm/Death with Environmental = .56, $p < .001$; Violent with Environmental = .61, $p < .001$). As suggested by Boduszek and Debowska (2016), when the best model fit is multi-dimensional, and some factors are highly correlated (.50 and above), a differential predictive validity test should be conducted to verify whether the factors correlate differentially with external variables. Three outcome variables (PTSD, Anxiety, and Depression) were used for examining differential predictive validity of the three factors of the PPTM. Table 3.4 presents the outcome of nine regression analyses for the full sample and gender split samples. Multicollinearity was assessed via the tolerance statistic and variance inflation factor (VIF). The tolerance values were greater than 0.10 and the VIF values were below 10 as suggested acceptable (Tabachinck & Fidell, 2013) therefore, as the obtained values did not meet the thresholds set this suggested multicollinearity was unlikely to be a cause for concern. Full sample, PTSD, Anxiety, Depression; Tolerance Value (Self-Harm/Death; .38; Violent; .34; Environmental; .61) VIF (Self-Harm/Death; 2.66; Violent; 2.95; Environmental; 1.64). Male sample, PTSD, Anxiety, Depression; Tolerance Value (Self-Harm/Death; .41; Violent; .36; Environmental; .65) VIF (Self-Harm/Death; 2.42; Violent; 2.78; Environmental; 1.53). Female sample, PTSD, Anxiety, Depression; Tolerance Value (Self-Harm/Death; .35; Violent; .34; Environmental; .58) VIF (Self-Harm/Death; 2.85; Violent; 2.94; Environmental; 1.72).

Table 3.4 Regression analyses results for full sample, males and females (predictors = 3 factors of PPTM; outcome variables = PTSD, Anxiety, and Depression).

	PTSD			Anxiety			Depression		
	Full	Males	Females	Full	Males	Females	Full	Males	Females
Self-Harm / Death	.08* (.48/.48)	.16*** (.08/.25)	-.05 (-.14/.05)	.04 (.03/.10)	.09* (.01/.18)	-.05 (-.14/.05)	.07* (.00/.13)	.09* (.02/.19)	.04 (.06/.13)
Violent	.19*** (.01/14)	.11* (.03/.22)	.28*** (.16/.35)	.13*** (.06/.20)	.07 (.02/.17)	.24*** (.13/.33)	.08* (-01/.14)	-.01 (-.10/.09)	.18*** (.07/.27)
Environmental	.10** (.04/.16)	.09* (.01/.18)	.13* (.03/.22)	.13*** (.06/.19)	.15*** (.07/.23)	.12* (.02/.22)	.15*** (.08/.21)	.18*** (.11/.27)	.08 (.02/.18)
Total	.31*** (.26/.36)	.29*** (.25/.39)	.33*** (.23/.37)	.25*** (.21/.30)	.25*** (.20/.34)	.29*** (.20/.34)	.24*** (.19/.29)	.21*** (.16/.30)	.27*** (.17/.31)

Note: * $p < .05$; ** $p < .01$; *** $p < .001$.

Self-Harm/Death trauma exposure was significantly correlated, in the male sample, with PTSD, Anxiety, and Depression but no significant correlations were observed in the female sample. Violent trauma exposure was significantly correlated, in the male sample, with only PTSD whereas in female sample Violent was significantly correlated with all outcome variables. Environmental trauma exposure was significantly correlated with all outcome variables in the male sample whereas, in the female sample, only with PTSD and Anxiety. Table 3.5 presents the outcome of a further nine regression analyses for prison officers from three prison categories (A, B, and C) with the same outcome variables as in Table 3.4.

Self-Harm/Death trauma exposure was significantly correlated with PTSD and Depression in category C prison officers. Violent trauma exposure was significantly correlated with PTSD in all categories, whereas with Anxiety only in category C. Environmental factor was significantly correlated with Anxiety and Depression for officers from category A and B. These results provide further support that the PPTM should be used as a three-subscale measure rather than a unidimensional measure.

Table.3.5 Regression analyses results for A, B, and C prison category (predictors = 3 factors of PPTM; outcome variables = PTSD, Anxiety, and Depression).

	PTSD			Anxiety			Depression		
	A	B	C	A	B	C	A	B	C
Self-Harm / Death	-.04 (-.22/.13)	.07 (.03/.17)	.14** (.04/.26)	-.13 (-.30/.04)	.06 (.05/.15)	.10 (.01/.22)	-.09 (-.25/.09)	.05 (.05/.15)	.14* (.03/.26)
Violent	.21* (.21/.39)	.16** (.05/.28)	.20*** (.10/.34)	.14 (.05/.30)	.09 (.02/.19)	.16** (.04/.29)	.02 (.17/.20)	.08 (.03/.19)	.11 (.01/.24)
Environmental	.16 (.01/.33)	.08 (.02/.17)	.08 (.03/.20)	.27*** (.12/.44)	.11* (.01/.19)	.05 (.06/.17)	.30*** (.15/.48)	.11* (.01/.20)	.10 (.01/.22)
Total	.29*** (.16/.41)	.27*** (.20/.35)	.35*** (.30/.48)	.24*** (.11/.35)	.21*** (.13/.28)	.26*** (.19/.37)	.19** (.06/.31)	.20*** (.12/.27)	.28*** (.21/.40)

Note: * $p < .05$; ** $p < .01$; *** $p < .001$. Category A, B, and C denotes security classification of prison with A being highest (maximum security).

3.4 DISCUSSION

Despite a large body of literature pertaining to Trauma Exposure Measures it has been identified that there is a lack of context specific measures available for unique occupational cohorts. Of interest in the current study were prison personnel, an occupation where exposure to violence, injury and death is a matter of routine (Denhof & Spinaris, 2013). Considering the suggestions that generalised measures of trauma exposure do not effectively encapsulate unique cohorts with potentially different sub symptomology (Stover & Berkowitz, 2005; O'Hare et al., 2013). The aim of the current study was to develop and validate the Prison Personnel Trauma Measure (PPTM) a brief self-report questionnaire that can be used amongst prison personnel to identify prevalence of trauma exposure unique to working in a prison environment. With a further aim being to demonstrate differential predictive validity for the subsequent development of PTSD, Depression, and Anxiety in varying categories of prison establishments and prison personnel gender.

Using traditional confirmatory factor analysis techniques, and as suggested by Boduszek and Debowska (2016) that competing solutions should be tested, two models of the PPTM were tested, with the three-factor model demonstrating a superior fit to the data and consisting of three meaningful factors of trauma exposure (self-harm/death, violent, and environmental) based on the CFI, TLI, RMSEA, and WRMR statistics. The three factorial solution displayed statistically significant factor loadings across all items with good composite reliability across the three factors. Furthermore, all fifteen items on the scale demonstrated standardised factor loadings above the desirable threshold of .40 as proposed by Comery and Lee (1992) only one item (9), demonstrated factor loadings below this but was still above the accepted threshold .33 (Comery & Lee, 1992) indicating that despite variances in the scores between items they demonstrated that the PPTM worked equally well for all items to measure the intended outcome construct via a three factorial solution, thus although item 3 could occur on a daily basis as opposed to item 12 which theoretically occurs far less frequently quantitatively it may produce similar levels of distress, although caution needs to be exercised as qualitatively differences may occur amongst individuals. Because the best model fit was multi-dimensional and some of the factors were highly correlated a differential predictive validity test was conducted to verify whether the three factors correlated differentially with the external variables of PTSD, Anxiety, and Depression. Multiple Regression Analysis was used to further test for predictive validity, all three PPTM factors evidenced good differential

predictive validity with the outcome variables. Self-Harm/Death trauma exposure was significantly correlated, in males, with PTSD, Anxiety, and Depression but not in females. Violent trauma exposure was significantly correlated, in males, but only with PTSD whereas for females Violence was significantly correlated with all the outcome variables (PTSD, Anxiety and Depression). Environmental trauma exposure was significantly correlated with all outcome variables in males whereas, in females it was only correlated with PTSD and Anxiety.

In terms of differences between prison personnel by category of prison (Categories A, B, and C denoting security classification of prison, with A being the highest or maximum security). Self-Harm/Death trauma exposure was significantly correlated with PTSD and Depression in category C prison officers. Violent trauma exposure was significantly correlated with PTSD in all categories, whereas with Anxiety only in category C. The Environmental factor was significantly correlated with Anxiety and Depression for personnel from category A and B prisons. The current findings highlighting the differential predictive validity to outcome variables demonstrate that the PPTM should be used as three-subscale measure rather than a unidimensional measure that simply encompasses one factor of trauma as opposed to three.

In respect to the findings of the multiple regression analyses, the results highlight that exposure to self-harm and death could be particularly problematic for male personnel leading to PTSD, anxiety or depression or even a comorbidity of these outcomes, female personnel did not display the same correlations on any variable. However, with female personnel violent trauma exposure appears to be particularly problematic and as in male personnel this may lead to PTSD, anxiety or depression or even a comorbidity of these outcomes, whereas in males it was only correlated with PTSD. Environmental trauma exposure appears particularly problematic for both males and females and is correlated with PTSD, anxiety and depression in males but only PTSD and anxiety in females. Both the latter findings may be an indication of differential symptomology response patterns in respect to the typology of trauma exposure with such differentiation being displayed between male and female personnel.

In consideration of trauma response outcomes in prison category, much greater disparity was observed. Self-harm death exposure could be particularly problematic for category C personnel leading to PTSD or depression or a comorbidity of these two outcomes. Violent trauma exposure appears to be particularly problematic in all categories with the potential development of PTSD but in C categories it may be further problematic leading to PTSD or anxiety or a comorbidity of these outcomes. Environmental trauma exposure could be

particularly problematic for category A and B personnel leading to depression or anxiety or a comorbidity of these two outcomes. This latter finding may be associated to the fact that historically category C prisons have always had significantly lower staffing levels than A or B categories indicating in particular that the variable of isolated working conditions with prisoners may not be as problematic for C category personnel. The disparity in associations between male and female personnel and A, B and C personnel may indicate that certain personnel may be more resilient and / or develop better coping mechanisms to certain adverse outcomes than others. However, because of a significant lack of previous research surrounding these considerations only a speculative assumption to these variabilities and potential causes can be made, however it does further demonstrate the ability of the PPTM to potentially indicate the variabilities in these factors and therefore highlight areas that warrant significant further research attention.

In respect to mean trauma values between the three prison categories (A, B and C) the results showed significant differences. In respect to self – harm / death and violent trauma exposure B was significantly greater than A or C, and C was significantly greater than A. In respect to environmental trauma B was significantly greater than A and C was significantly greater than A. These results further demonstrate the ability of the PPTM to provide differential predictive validity. Category B prisons hold the largest number of prisoners on average with a high percentage on remand, as well as dealing with offenders who are newly incarcerated this can therefore lead to greater instability, official statistics (Ministry of Justice, 2016, 2017, 2019) indicate these prisons have higher incidences of assaults, self – harm, and suicides as well as lower staffing levels than Category A prisons. Furthermore, for the most part although detaining the highest security class of offender A prisons are generally shown to be statistically more stable than their counterparts. B and C prisons did not differ in respect to environmental trauma which measures a component of working isolated in areas of poor visibility that are more commonplace in prisons with lower staffing levels as well as expenditure to improve infrastructure. In line with these findings B prisons demonstrated higher mean values for PTSD, Depression and Anxiety than A or C prisons, C demonstrated higher values than A, however only levels of Anxiety were found to be statistically significant between B and A prisons. However, these findings do provide some support for the PPTM's ability to differentiate trauma exposure between prison category in line with symptomology levels.

The current study provides a significant contribution to the area of trauma exposure measurement particularly in prison context specific populations and demonstrates the ability to

isolate particular context specific variables within specific populations of focus as per recommendations from previous research calling for the development of more isolating measures (Stover & Berkowitz, 2005, O'Hare et al., 2013). The development of the PPTM addresses issues surrounding previous measures developed (VIDES: Denhof & Spinaris, 2014) that are inadequate to fully encapsulate the unique exposures prison personnel may face as well as shortcomings in their specific utility for use as a prison context specific instrument.

In developing the PPTM, the most recent research findings in the field of psychological symptomology in prison personnel were relied upon (Spinaris et al., 2012; Denhof & Spinaris, 2013; Boudoukha et al., 2013; Denhof et al., 2014). The current study fully supports the findings of previous research with particular reference to context specific trauma exposures and potential high probability of the development of adverse symptomology, and further elucidates this specific research area.

Specifically, evidence is presented that supports previous findings (Konda et al., 2013; Schlosser et al., 2010; Spinaris et al., 2012; Denhof & Spinaris, 2016) that prison work is traumatic and prison personnel are at significant risk of trauma exposure. The current findings support previous work that frontline staff are particularly at risk in relation to other prison personnel (Denhof & Spinaris, 2013; Obidoa et al., 2011; Spinaris et al., 2012; Stadnyk, 2003). Furthermore, the current study supports previous findings that show PTSD, depression and anxiety comorbidity may be particularly problematic amongst prison personnel (Spinaris et al., 2012; Denhof & Spinaris, 2013; Denhof et al., 2014) as opposed to PTSD, depression or anxiety in isolation (Denhof & Spinaris, 2013). As such the PPTM provides a substantive measure to further elucidate this research area in future studies.

The significant strengths of the current study lie in the utilization of a large sample of prison personnel, which often have limited access to researchers, and are a significantly under researched trauma exposed population. The PPTM can be used to ascertain potential vulnerability to the subsequent development of adverse psychological symptoms namely PTSD, Anxiety, and Depression amongst prison personnel following specified trauma related experiences that occur in the prison environment. The PPTM can be utilised alongside the use of clinical or established self-report measures for PTSD, anxiety and depression in order to identify individuals or subsets of personnel who may be at risk for the development of psychological illnesses in association to prison trauma exposure.

3.4.1 Limitations of current research and further directions

There are several potential limitations to the current study. The use of self-report measures and cross-sectional design means causation can be difficult to ascertain which is a common concern in self-report research. It is also important to note that the analyses were based on data from prison personnel in England and Wales only and, as such, the findings may not be generalizable to other countries. Future studies should validate the PPTM using more systematic sampling (rather than opportunistic) among prison personnel samples drawn from different international organisational backgrounds. In future research the PPTM should also be cross validated with a measure such as the Life Events Checklist (LEC-5; Weathers et al., 2013) to evaluate the concurrent validity of a life event traumatic stress reaction amongst prison personnel. The current study utilised the PCL-C (Weathers et al., 1994) which maps directly onto DSM-IV diagnostic criteria for PTSD however, future studies should utilise the PCL-5 (Weathers et al., 2013) which maps directly onto DSM-V diagnostic criteria. The PCL-5 can be used to elucidate further investigation into complex PTSD diagnoses as defined in the ICD-11 (WHO, 2018) as it allows the sub categorisation classification of the disorder, namely the addition of NACM (negative alterations of cognition and mood) symptoms as well as the current, intrusion, avoidance, and hyper-arousal symptomology. Complex PTSD has been shown to be particularly problematic for cohorts of chronically trauma exposed individuals (Shevlin et al., 2017).

4.4.2 Conclusions

In spite of the limitations listed above, the current chapter provides a significant contribution to the area of trauma exposure measurement particularly in prison context specific populations. In developing the PPTM, the most recent research findings in the field of psychological symptomology in prison personnel were relied upon. The reliability and dimensionality of the PPTM was carefully tested within a large sample of personnel drawn from the prison staffing population of England and Wales, across varying categories of prisons and occupational duties. It was found that the PPTM consists of three meaningful factors of trauma exposure (self-harm/death, violent, and environmental trauma exposure). Equally important, the three factors evidenced good differential predictive validity. Clear practical implications of the PPTM's ability to distinguish prison personnel trauma is thereby evidenced, providing a more context specific measurement tool of such acute occupational stressors.

CHAPTER FOUR:

Latent Profiles of PTSD, Anxiety and Depression and association with Trauma Exposure

Abstract

Objective: The aim of this chapter was to identify meaningful subtypes of Anxiety, Depression and PTSD symptomology amongst Prison Personnel. A further aim was to estimate the association between Anxiety, Depression and PTSD class membership and typology of Prison Trauma Exposure (Self-Harm/Death, Violent, Environmental) age and years of service.

Method: The Prison Personnel Trauma Measure (PPTM), Hospital Anxiety and Depression Scale (HADS) and the Posttraumatic Stress Disorder Checklist – Civilian Version (PCL-C) were administered to 1995 Prison Personnel in England and Wales, using non-probability convenience sampling, from personnel serving in $N = 123$ Prison's, ranging from High to Low Security, housing Adult Male and Female (21+), Young Offenders (18-21) and Juvenile (under 18's) Prisoners.

Results: Latent profile analysis revealed seven distinct classes in male personnel: a 'low symptom group' (14.2%) a 'moderate Anxiety / Depression group' (7.6%) a 'moderate with low PTSD-B group' (26.2%) a 'moderate with increased PTSD-C and low PTSD-B group'. group' (18.5%) a 'moderate symptom group' (6.4%) a 'heightened symptom (16.8%) and a 'high symptom group' (10.3%) and five distinct classes in female personnel: a 'low symptom group' (15.4%) a 'moderate Anxiety / Depression group' (9.7%) a 'moderate with low PTSD group' (28.4%) a 'above moderate symptom group' (28.4%) and a 'high symptom group' (18.1%). Low symptom class was a reference group. Multinomial logistic regression showed that male prison personnel in the 'moderate with increased PTSD-C and low PTSD-B group' and the 'heightened symptom group' were more likely to be exposed to environmental trauma, whereas male prison personnel in the 'high symptom group' were more likely to be exposed to environmental trauma, self-harm/death in prison and have significantly less years of service. Female prison personnel in the 'moderate symptom group' were more likely to be exposed to environmental and violent trauma, whereas in the 'high symptom group' females were more likely to be exposed to violent traumatic events during the service.

Conclusion: Findings suggest distinctions between Anxiety, Depression and PTSD symptomology amongst male and female prison personnel and typology of prison trauma exposure. The significance of the present findings is discussed in relation to past and future research as well as clinical practice.

4.1 INTRODUCTION

Post-traumatic stress disorder is characterised by sets of symptom clusters. Within DSM-IV (APA, 2000) these were formerly comprised of three categories, intrusion, avoidance, and alterations in arousal and reactivity. With amendments to the diagnosis of PTSD in DSM-5 (APA, 2013) a fourth category with its own distinctive symptomology was added, negative alterations in cognitions and mood. The new elements of which were previously incorporated into and measured to a lesser extent by the previous symptom clusters. The former symptom categories within DSM-IV were classified as criterion B, C, and D symptom clusters, as opposed to the newer categories of B, C, D, and E within DSM-5. The diagnosis of PTSD requires exposure to a traumatic event and that the four clusters of symptoms are present for at least one month, causing significant distress or impairment to the individual affected (APA, 2013) (for detailed description please see Section 1.3 sub section 1.3.2, PTSD).

Prevalence rates of 3.5% for PTSD have been found in the US with 0.5 – 1.0% in European, Asian, African and Latin American countries (APA, 2013). The highest rates have been found in areas of armed conflict (Bisson et al., 2015) and in occupations whose roles entail a higher risk of trauma exposure (Perrin et al., 2007; Corneil et al., 1999; Fulton et al., 2015). Many individuals who are exposed and react to traumatic events may also show similar symptoms of posttraumatic stress without meeting full criteria for diagnosis, such trauma-exposed individuals develop subthreshold PTSD (Helzer et al., 1987; Stein et al., 1997; McLaughlin et al., 2015). Subthreshold PTSD is clinically relevant, and is associated with significant impairment (Marshall et al., 2001; Cukor et al., 2010). Subthreshold PTSD may be particularly relevant to chronically trauma exposed occupations, research on police officers has indicated a prevalence rate of PTSD between 4.5 and 9% (Berger et al., 2012; Maia et al., 2007) with rates of 15-16% with subthreshold PTSD (Maia et al., 2007; Marmar et al., 2006).

Individuals with PTSD are also 80% more likely to present with symptoms that meet diagnostic criteria for at least one other mental disorder, depression, substance use and anxiety being the most commonly occurring comorbid disorders alongside PTSD (Brady et al., 2000). Military and civilian psycho-traumatisation studies show PTSD rarely occurs in isolation amongst trauma exposed individuals (Kozari´c-Kovaci´c et al., 2001; Orsillo et al., 2002). High disparate rates of comorbidity with PTSD have been reported, PTSD with depression has been found to range from, 21-94% comorbid with anxiety 39-97% and 11-67% endorsing a triple

comorbidity (Ginzburg et al., 2010). Breslau (2002) and O'Donnell et al. (2004) have attributed such wide ranging findings to the fact that firstly, depression and anxiety may increase the risk of developing PTSD; secondly PTSD may be causational in the development of anxiety and depression; thirdly the observed comorbidity may be attributed to an overlap of symptomology and fourthly, PTSD, anxiety and depression may share commonalities of risk factors but remain distinct disorders. A latent class analysis of PTSD comorbidity (Galatzer-Levy, Nickerson, Litz & Marmar, 2013) found three meaningful subtypes of lifetime comorbidity with PTSD; comorbid mood and anxiety disorders; comorbid mood, anxiety, and substance dependence; and a low-comorbidity PTSD class.

Within trauma exposed occupations, comorbid symptomology has been found to be prevalent, military veteran's rates of triple comorbidity (PTSD, anxiety and depression; 26.7–30.1%) were higher than rates of PTSD, singularly (9.3–11.1%), or comorbid with depression (1.2–4.5%) or anxiety (2.9–4.5%) Furthermore, PTSD was found to predict depression, anxiety, and comorbid disorders, but not vice versa. (Ginzburg et al., 2010). Jones et al., (2018) found rates in Firefighters and Paramedics of 14% for severe depressive symptoms, 28% for severe anxiety symptoms, and 26% for significant symptoms of PTSD. Meta-analysis of PTSD literature conducted on ambulance personnel, concluded a prevalence rate of 11% for PTSD, 15% for depression, 15% for anxiety, and 27% for general psychological distress (Petrie et al., 2018).

Typology of trauma event exposure has also been shown to be significantly linked with higher numbers of comorbid disorders, particularly those involving interpersonal violence (Leskin, 2002; Rees, 2011). Victims of crime, especially those subjected to interpersonal violence have been shown to be vulnerable to a constellation of outcomes including dissociation, substance abuse, anxiety, depression and PTSD (Foa et al., 1999; Roth et al., 1997). The nature and typology of crime, particularly serious sexual and interpersonal violence is associated with PTSD development. Furthermore, successive minor incidents may make it increasingly difficult for such victims to cope, victimisation that leads to the development of chronic stress, depression or anxiety has been found to confound an individual's ability to resist development of psycho traumatisation induced conditions as a result of repeated traumatic victimisation (Howitt, 2006).

Findings from research across several countries suggest working in a prison environment can be potentially traumatic (Johnson et al., 2005; Spinaris et al, 2012; Denhof & Spinaris, 2013; Boudoukha et al., 2013; Denhof, Morton & Spinaris, 2014; Kinman et al., 2014)

with PO's reporting poorer physical and psychological health than other trauma exposed occupational groups (Johnson et al., 2005; Kinman et al., 2014). Individual PO's in the US have been shown to experience an average of 28 exposures to traumatic incidents at any one time over a five-year period, with potentially higher figures now reported within England and Wales (Ministry of Justice, 2018) the experiencing of violence and aggression, from prisoners has been highlighted as a particularly problematic area (Spinaris et al., 2012). Whilst in the US from 1999 to 2008, there were 28 murders of prison officers (Konda et al., 2013). Prison related occupations have not received comparable research attention to other at-risk occupations, and it is evident that PO's are exposed similar potentially traumatic events as police officers (Perrin et al., 2007), firefighters (Corneil et al., 1999), and military personnel (Fulton et al., 2015). Given that PO's are directly exposed to potentially traumatic events as part of their occupational role (Bureau of Labour Statistics, 2015; Denhof & Spinaris, 2013; Denhof et al., 2014; Konda et al., 2013; Spinaris et al., 2012; Stadnyk, 2003), there is the potential for development of adverse psychological outcomes such as PTSD, subthreshold PTSD, anxiety, and depression. Research has shown PO's demonstrate high levels of PTSD symptomology, burnout, and stress, with violent interactions with prisoners being particularly problematic (Boudoukha et al. 2013). Furthermore, whilst a variety of health-related consequences have been linked to traumatic exposure in prison settings, Denhof and Spinaris (2013) have highlighted that comorbid depression and PTSD is particularly consequential. Prison Personnel with comorbid status demonstrate significantly higher negative health conditions than prison staff with either PTSD or depression alone.

4.1.1 The current study

Findings of previous research suggest high levels of PTSD comorbidity with depression and anxiety (Ginzburg et al., 2010; Galatzer-Levy et al., 2013), and that figures may be significantly higher in chronically trauma exposed occupations (Jones et al., 2018; Petrie et al., 2018) with comorbid PTSD being particularly consequential for prison personnel (Denhof & Spinaris, 2013). The aims of the current study were to address the limitations of existing research surrounding comorbid PTSD symptomology in trauma exposed occupations within a sample of UK based prison personnel. The primary aim being to uncover meaningful subtypes of trauma exposed prison personnel with PTSD (symptom clusters, criterion B [intrusion symptoms], criterion C [avoidance symptoms] and criterion D [alterations in arousal and reactivity symptoms] as defined by DSM-IV [APA, 2000] and measured by the PCL-C [Weathers et al., 1994]) as well as anxiety, and depression symptomology within male and

female participants using latent profile analysis. The secondary aim of the analysis was to use multinomial regression analysis to identify associations between typology of the three trauma factors measured by the PPTM (please see Chapter 3) self-harm/death, violent, and environmental exposure, and classes of symptomology identified by the latent profile analysis, within male and female participants. Owing to the limitations of previous research, a formulation of any a priori hypotheses was not made, in regard to the numbers or distinctions between classes, however it was expected that classes scoring high and low on all symptomology subsets and would be identified in both male and female participants. It was also expected that associations between identified symptomology classes and typologies of trauma would exist and differentiations would occur between male and female participants. In an attempt to verify the prevalence of comorbidity in prison personnel without relying on cut off points calculated for total scores, a goal was to establish what percentage of prison personnel would be classed in the higher symptom latent classes.

4.2 METHOD

4.2.1 Participants and Procedure

A total of *N* =1995 prison personnel responded and returned completed surveys. Due to some of the returned surveys having significant missing data *N* = 1562 respondents were included in the final analysis. The sample consisted of *n* = 948 male and *n* = 614 female participants (for full description of the sample and sampling procedures please see Chapter 2 Methodology, Section 2.2 and Sub Section 2.2.4)

4.2.2 Measures

The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983); The Posttraumatic Stress Disorder Checklist – Civilian Version (PCL-C; Weathers et al., 1994); Prison Personnel Trauma Measure were administered to all participants (for full description of the measures utilised please see Chapter 2 Methodology, Section 2.3 and Sub Section 2.3.1 to 2.3.4).

4.2.3 Analytical Procedures

Latent profile analysis (LPA) was used to identify latent classes from a sample (*N* = 1562) of prison personnel, using three factors of the PPTM (for a full description of the LPA procedure please see Chapter 2, 2.5.4). First, LPA was calculated to define the number of Anxiety, Depression and PTSD latent classes and check whether they differed qualitatively or quantitatively. Second, using a multinomial logistic regression, correlations between latent classes of Anxiety, Depression and PTSD and type of trauma exposure (Self – Harm / Death, Environmental and Violent Exposure) were calculated. Eight alternative models for male participants were assessed (a 1-class model through to an 8-class model) and five alternative models for female participants were assessed (a 1-class model through to a 5-class model) using robust maximum likelihood. The Akaike Information Criterion (AIC), the Bayesian Information Criterion (BIC), and sample size adjusted Bayesian Information Criterion (SSA-BIC) were used to assess competing models. The model with the lowest value suggests the best latent profile solution. Nylund et al. (2007) suggested that the BIC value is preferred. Entropy was also estimated. Based on Ramaswamy et al. (1993) simulation studies higher values indicatie a better latent profile solution. Additionally, the Lo-Mendell-Rubin adjusted

likelihood ratio test (LRT) was used to compare latent profiles. A non- significant value indicates that the latent profile solution with one less class is preferred.

4.3 RESULTS

The fit statistics for the LPA of Anxiety, Depression, PTSD model for males is presented in Table 4.1 and for females in Table 4.2. The lowest BIC value is observed for the 7-class solution for males and 5 class solution for females and the LRT test shows that there is no significant improvement in fit for the 8-class solution for males and 6 class solution for females. The entropy test confirms the above solutions. Based on the results, the 7-class solution (for males) and 5 class solution (for females) are considered the best fitting models.

Table 4.1 Fit Indices for the Latent Profile Analysis of Males

Model	**AIC**	**BIC**	**SSABIC**	**LRT**	***p***	**Entropy**
2 classes	26877.20	26954.87	26904.05	2156.18	<.001	.89
3 classes	26169.22	26276.02	26206.15	702.88	<.001	.86
4 classes	25923.16	26059.08	25970.15	251.94	<.05	.84
5 classes	25691.75	25856.79	25748.81	237.63	<.001	.86
6 classes	25586.14	25780.32	25653.28	114.81	<.001	.84
7 classes	25466.47	25689.77	25543.68	128.55	<.05	.84
8 classes	25412.19	25664.62	25499.47	64.71	.132	.84

Note. AIC = Akaike information criterion, BIC = Bayesian information criterion, SSABIC = sample size adjusted BIC, LRT = Lo-Mendell-Rubin's adjusted likelihood ratio test.

Table 4.2 Fit Indices for the Latent Profile Analysis of Females

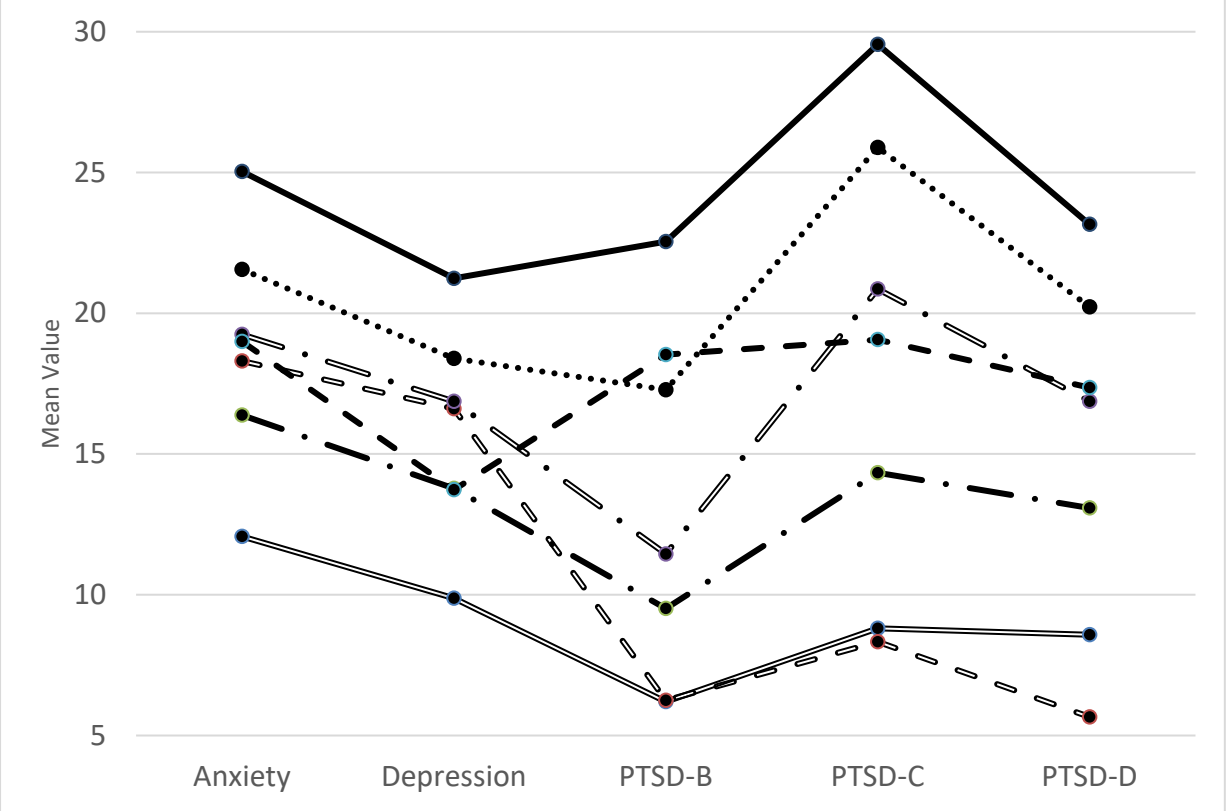
Table 4.2 Fit Indices for the Latent Profile Analysis of Females

Model	**AIC**	**BIC**	**SSABIC**	**LRT**	***p***	**Entropy**
2 classes	17496.89	17567.62	17516.82	1395.22	<.001	.90
3 classes	17125.25	17222.49	17152.65	373.93	<.001	.86
4 classes	16959.82	17083.58	16994.69	172.94	<.001	.84
5 classes	16797.15	16947.43	16839.48	170.25	<.001	.87
6 classes	16742.83	16919.63	16792.64	64.64	.49	.85
7 classes	16698.23	16901.55	16755.51	55.17	.17	.82
8 classes	16658.62	16888.46	16723.37	50.31	.55	.83

Note. AIC = Akaike information criterion, BIC =
Bayesian information criterion, SSABIC = sample size adjusted BIC, LRT = Lo-Mendell-Rubin's adjusted likelihood ratio test.

Figure 4.1 shows the profile plot for the 7-class solution for males. Descriptive statistics with mean differences for the entire sample are presented in Table 4.3. Means and standard deviations for the LPA are presented in Table 4.4. Class 1 (*n* = 135, 14.2% of Male Personnel) is characterised by low mean scores on all 5 symptom dimensions (Anxiety, Depression, PTSD-B, PTSD-C and PTSD-D) and is labelled the 'low symptom group'. Class 2 (*n* = 72, 7.6% of Male Personnel) is characterised by moderate mean scores on Anxiety and Depression and low mean scores on PTSD – B, C and D this class is labelled the 'moderate Anxiety / Depression group'. Class 3 (*n* = 248, 26.2% of Male Personnel) is the largest group and is characterised by moderate mean scores on Anxiety, Depression, PTSD-C and PTSD-D and low PTSD-B scores and is labelled the 'moderate with low PTSD-B group'. Class 4 (*n* = 175, 18.5% of Male Personnel) is characterised by moderate mean scores for Anxiety and Depression, below moderate PTSD-B mean scores, high PTSD-C mean scores and moderate PTSD-D scores, this class is labelled the 'moderate with increased PTSD-C and low PTSD-B group'. Class 5 (*n* = 61, 6.4% of Male Personnel) is characterised by moderate mean scores on Depression, Anxiety and PTSD and is labelled the 'moderate symptom group'. Class 6 (*n* = 159, 16.8% of Male Personnel) is characterised by higher mean scores for Anxiety, Depression moderate PTSD – B, heightened PTSD-D and higher characterised scoring on PTSD-C and is labelled the 'heightened symptom group'. Class 7 (*n* = 98, 10.3% of Male Personnel) is characterised by the highest mean scores for Anxiety, Depression and PTSD –B, C, D and is labelled the 'high symptom group'.

Figure 4.1 Latent profile plot for males.



Class 1 = double straight line (*n* = 135, 14.2% of participants); Class 2 = double dashed line (*n* = 72, 7.6%); Class 3 = dashed dotted solid line (*n* = 248, 26.2%); Class 4 - dashed dotted unsolid line (*n* = 175, 18.5%); Class 5 = solid dashed line (*n* = 61, 6.4%); Class 6 = dotted line (*n* = 159, 16.8%); Class 7 = solid line (*n* = 98, 10.3%).

**note values for non-clinical cut off scores, Anxiety / Depression, 15-17 borderline case, 18-28 abnormal case (HADS; Zigmond & Snaith, 1983); PTSD-B, 15-25 symptomatic, PTSD-C, 21-35 symptomatic, PTSD-D, 15-25 symptomatic (PCL-C; Weathers et al., 1994).*

Table 4.3 Descriptive Statistics for All Participants (Total) and Differences between Males and Females

	Total					Males	Females	
Variable	***M***	***SD***	***Mdn***	**Mode**	**Observed Scores Min-Max**	***M* (*SD*)**	***M* (*SD*)**	***t* value (Cohen's d)**
Age	43.08	10.76	45	49	19-71	45.22 (10.36)	39.77(10.54)	10.05*(.52)
Years of Service	14.25	8.58	13	1	1-43	15.98 (8.80)	11.59 (7.49)	10.56*(.54)
Trauma – Death / Self Harm	7.58	1.88	8	7	3-12	7.73 (1.77)	7.34 (2.02)	3.86*(.20)
Trauma - Violent	21.24	4.24	22	25	8-32	21.88 (3.91)	20.27 (4.54)	7.45*(.38)
Trauma - Environmental	9.76	2.58	10	9	4-16	10.14 (2.47)	9.17 (2.64)	7.37*(.38)
Anxiety	18.49	4.46	18	18	7-28	18.39 (4.44)	18.64 (4.50)	-1.10(-.06)
Depression	15.32	4.27	15	15	7-28	15.55 (4.31)	14.95 (4.19)	2.70(.14)
Criterion B PTSD	12.20	5.81	11	5	5-25	12.41 (5.85)	11.88 (5.73)	1.75(.09)
Criterion C PTSD	17.65	7.46	17	7	7-35	18.14 (7.57)	16.90 (7.23)	3.19*(.16)
Criterion D PTSD	14.89	5.79	15	5	5-25	15.14 (5.72)	14.50 (5.89)	2.12(.11)

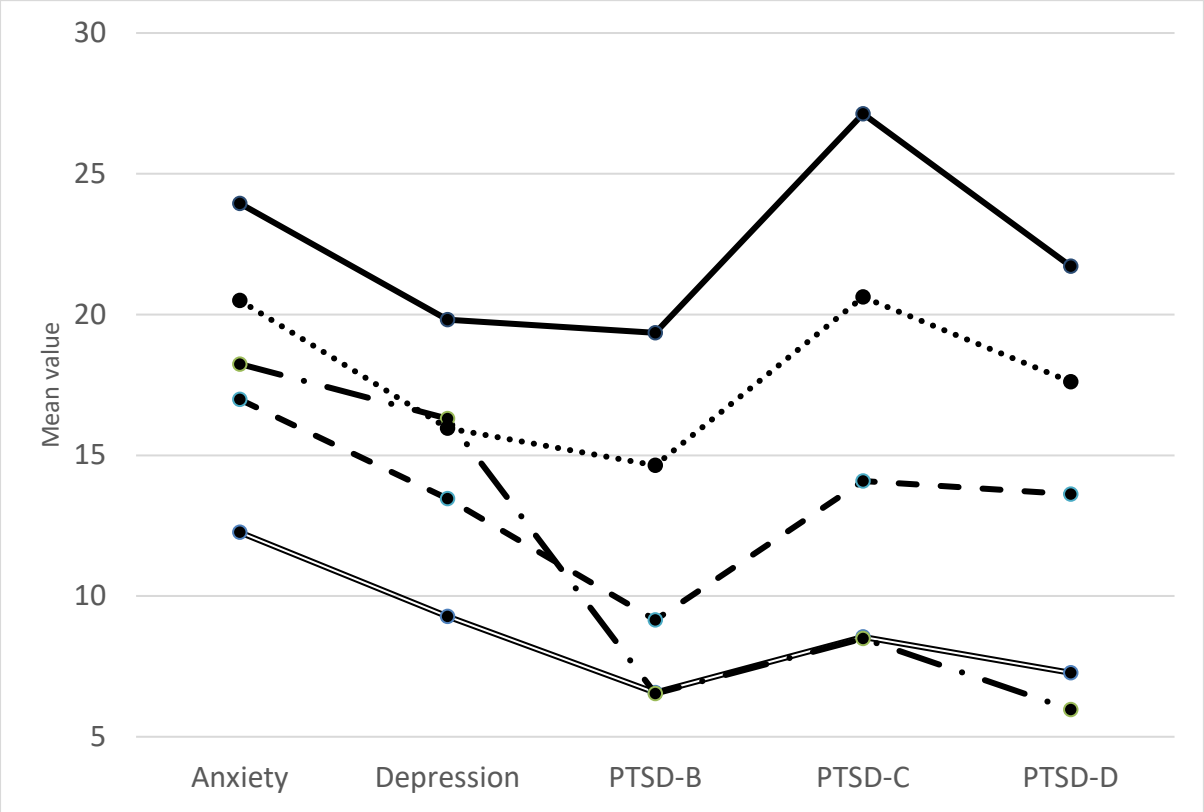
Note. Bonferroni correction (* $p < .005$). Cohen (1977) suggested that d = 0.2 be considered a small effect size, 0.5 represents a medium effect size, and 0.8 denotes a large effect size.

Table 4.4 Descriptive statistics (M and SD) for LPA males

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7
Anxiety	12.07	18.30	16.38	19.25	19.00	21.56	25.03
	(2.56)	(2.56)	(2.56)	(2.56)	(2.56)	(2.56)	(2.56)
Depression	9.87	16.61	13.78	16.87	13.73	18.39	21.24
	(2.79)	(2.79)	(2.79)	(2.79)	(2.79)	(2.79)	(2.79)
PTSD-B	6.20	6.25	9.51	11.45	18.53	17.28	22.54
	(2.53)	(2.53)	(2.53)	(2.53)	(2.53)	(2.53)	(2.53)
PTSD-C	8.81	8.33	14.33	20.86	19.06	25.89	29.55
	(3.02)	(3.02)	(3.02)	(3.02)	(3.02)	(3.02)	(3.02)
PTSD-D	8.58	5.66	13.08	16.87	17.36	20.22	23.16
	(2.58)	(2.58)	(2.58)	(2.58)	(2.58)	(2.58)	(2.58)

Figure 4.2 presents the latent profile plot for the 5-class solution for females. M and SDs for the LPA are presented in Table 4.5. Class 1 (*n* = 95, 15.4% of Female Personnel) is characterised by low mean scores on all 5 symptom dimensions (Anxiety, Depression, PTSD-B, PTSD-C and PTSD-D) and is labelled the 'low symptom group'. Class 2 (*n* = 60, 9.7% of Female Personnel) is characterised by moderate mean scores on Anxiety and Depression and low mean scores on PTSD – B, C and D this class is labelled the 'moderate Anxiety / Depression group'. Class 3 (*n* = 174, 28.4% of Female Personnel) is the joint largest group and is characterised by moderate mean scores on Anxiety, Depression, and low PTSD-B, PTSD-C and PTSD-D scores and is labelled the 'moderate with low PTSD group'. Class 4 (*n* = 174, 28.4% of Female Personnel) is also the joint largest group and is characterised by moderate mean scores on Depression, Anxiety and PTSD and is labelled the 'moderate symptom group'. Class 5 (*n* = 111, 18.1% of Female Personnel) is characterised by the highest mean scores for Anxiety, Depression and PTSD –B, C, D and is labelled the 'high symptom group'.

Figure 4.2 Latent profile plot for females.



Class 1 = double straight line (n = 95, 15.4% of participants); Class 2 = dashed dotted solid line (n = 60, 9.7%); Class 3 = solid dashed line (n = 174, 28.4%); Class 4 = dotted line (n = 174, 28.4%); Class 5 = solid line (n = 111, 18.1%).

**note values for non-clinical cut off scores, Anxiety / Depression, 15-17 borderline case, 18-28 abnormal case (HADS; Zigmond & Snaith, 1983); PTSD-B, 15-25 symptomatic, PTSD-C, 21-35 symptomatic, PTSD-D, 15-25 symptomatic (PCL-C; Weathers et al., 1994).*

Table 4.5 Descriptive statistics (M and SD) for LPA females

	Class 1	Class 2	Class 3	Class 4	Class 5
Anxiety	12.26	18.24	16.98	20.50	23.94
	(2.66)	(2.66)	(2.66)	(2.66)	(2.66)
Depression	9.28	16.30	13.46	15.96	19.82
	(2.69)	(2.69)	(2.69)	(2.69)	(2.69)
PTSD-B	6.57	6.53	9.15	14.64	19.35
	(3.36)	(3.36)	(3.36)	(3.36)	(3.36)
PTSD-C	8.55	8.49	14.09	20.62	27.13
	(3.11)	(3.11)	(3.11)	(3.11)	(3.11)
PTSD-D	7.27	5.97	13.62	17.61	21.72
	(2.72)	(2.72)	(2.72)	(2.72)	(2.72)

The association between Anxiety, Depression, PTSD-B, PTSD-C and PTSD-D class membership and trauma exposure type, age and years of service in Male and Female Personnel was estimated using a multinomial logistic regression (MLR) (see Table 4.6 for males, Table 4.7 for females). Multicollinearity was assessed via the tolerance statistic and variance inflation factor (VIF). The tolerance values were greater than 0.10 and the VIF values were below 10 as suggested acceptable (Tabachinck & Fidell, 2013) therefore, as the obtained values did not meet the thresholds set this suggested multicollinearity was unlikely to be a cause for concern. Male sample, PTSD-B, C, D, Anxiety, Depression; Tolerance Value (Self-Harm/Death; .41; Violent; .35; Environmental; .65; Age; .43 Years of Service; .42) VIF (Self-Harm/Death; 2.43; Violent; 2.84; Environmental; 1.53; Age; 2.34; Years of Service; 2.36). Female sample, PTSD-B, C, D, Anxiety, Depression; Tolerance Value (Self-Harm/Death; .34; Violent; .34; Environmental; .58; Age; .46 Years of Service; .45) VIF (Self-Harm/Death; 2.97; Violent; 2.97; Environmental; 1.72; Age; 2.16; Years of Service; 2.25).

In both samples low symptom latent class was a reference group. Results suggest that male personnel in the 'moderate with increased PTSD-C and low PTSD-B group' (class 4) are significantly more likely to be exposed to environmental trauma (OR = 1.21, 95% CI = 1.05/1.39, $p < 0.05$) in comparison to the 'low symptom group' (class 1). Male personnel in the 'heightened symptom group' (class 6) are significantly more likely to be exposed to environmental trauma (OR = 1.16, 95% CI = 1.01/1.33, $p < 0.05$) in comparison to the 'low

symptom group' (class 1). Finally male personnel in the 'high symptom group' (class 7) are significantly more likely to be exposed to environmental trauma (OR = 1.23, 95% CI = 1.05/1.44, $p < 0.01$) Self – Harm / Death Trauma (OR = 1.31, 95% CI = 1.04/1.66, $p < 0.05$) and have significantly less years of service (OR = 0.93, 95% CI = 0.88/0.99, $p < 0.01$) in comparison to the 'low symptom group' (class 1). Results suggest that female personnel in the 'moderate symptom group' (class 4) are significantly more likely to be exposed to environmental trauma (OR = 1.23, 95% CI = 1.05/1.44, $p < 0.01$) and violence trauma (OR = 1.16, 95% CI = 1.03/1.31, $p < 0.01$) in comparison to the 'low symptom group' (class 1). Finally, females in the 'high symptom group' (class 5) are significantly more likely to be exposed to violence trauma (OR = 1.23, 95% CI = 1.08/1.42, $p < 0.001$) in comparison to the 'low symptom group' (class 1).

Table 4.6 Associations between Classes and Covariates (Males)

Variable	**7 with 1** OR (95% CI)	**6 with 1 OR (95% CI)**	**5 with 1 OR (95% CI)**	**4 with 1 OR (95% CI)**	**3 with 1 OR (95% CI)**	**2 with 1 OR (95% CI)**
Trauma – Death / Self Harm	1.31* (1.04/1.66)	1.14 (.90/1.44)	1.08 (.87/1.34)	1.11 (.89/1.37)	1.01 (.85/1.20)	.92 (.73/1.17)
Trauma - Violent	1.11 (.96/1.27)	1.09 (.95/1.26)	1.08 (.92/1.27)	1.03 (.92/1.16)	1.06 (.96/1.17)	1.07 (.94/1.23)
Trauma - Environmental	1.23** (1.05/1.44)	1.16* (1.01/1.33)	.90 (.74/1.10)	1.21* (1.05/1.39)	1.00 (.87/1.15)	1.05 (.90/1.23)
Age	1.03 (.99/1.07)	.99 (.95/1.03)	1.02 (.96/1.08)	0.98 (.94/1.02)	.97 (.93/1.01)	.99 (.95/1.03)
Years of Service	.93** (.88/.99)	.98 (.92/1.04)	.99 (.93/1.05)	.97 (.93/1.01)	1.00 (.97/1.04)	.97 (.92/1.03)

Note. * $p < .05$; ** $p < .01$; *** $p < .001$

Table 4.7 Associations between Classes and Covariates (Females)

Variable	5 with 1 OR (95% CI)	4 with 1 OR (95% CI)	3 with 1 OR (95% CI)	2 with 1 OR (95% CI)
Trauma – Death / Self Harm	.95 (.75/1.20)	.97 (.78/1.20)	.99 (.80/1.23)	.90 (.68/1.18)
Trauma - Violent	1.23*** (1.08/1.42)	1.16* (1.03/1.31)	1.03 (.91/1.16)	1.07 (.92/1.25)
Trauma - Environmental	1.16 (.97/1.39)	1.23** (1.05/1.44)	1.15 (.98/1.35)	1.08 (.87/1.34)
Age	1.00 (.96/1.04)	.97 (.93/1.01)	.98 (.94/1.02)	.98 (.94/1.02)
Years of Service	.98 (.92/1.04)	1.01 (.95/1.07)	.98 (.92/1.04)	.98 (.92/1.04)

Note. * $p < .05$; ** $p < .01$; *** $p < .001$

4.4 DISCUSSION

The aim of the current study was to uncover meaningful subtypes of trauma exposed prison personnel with PTSD, anxiety, and depression symptomology within male and female participants, with a further aim being to identify associations between the typology of three trauma factors (as measured by the PPTM) specific to working in a prison environment, self-harm/death, violent, and environmental exposure, and classes of symptomology, within male and female participants. Using LPA, seven and five classes of male and female prison personnel respectively, with comorbid PTSD, anxiety, and depression symptomology were identified, with both a male and female class characterised by high PTSD (B, C, and D), anxiety and depression symptomology. MLR also revealed differential associations between PTSD, anxiety, and depression symptomology and typology of prison trauma (self-harm/death, violent, environmental).

The results of the LPA yielded a 7-class solution with males and a 5-class solution with female participants. For both genders class 1 was characterised by low mean scores on all five symptom groups and has been labelled the 'low symptom group' consisting of 14.2% of male personnel and 15.4% of female personnel, class 1 served as a reference group for all other classes. The identification of a low to non-existent symptomology sample group across the five symptom subsets was expected and stood to reason that a proportion of the sample would present with limited or no symptomology. For both genders a class was identified that was characterised by moderate mean scores on Anxiety and Depression and low mean scores on PTSD – B, C and D and labelled the 'moderate Anxiety / Depression group' consisting of 7.6% of male personnel and 9.7% of female personnel. For females this was the lowest percentage group. Class 2 for both genders demonstrated a presence of moderate levels of comorbid depression and anxiety with very little symptomology for PTSD criterions. For male personnel class 3 was the largest group consisting of 26.2% of male personnel and joint largest for female personnel (28.4%). Both groups were characterised by moderate scores for anxiety, depression, however although PTSD symptom clusters were observed as moderate for PTSD-C and PTSD-D and low for PTSD-B in males, females demonstrated moderate PTSD scores overall. These groups were labelled the 'moderate with low PTSD group' for females (owing to the differentiation in PTSD symptoms) and the 'moderate with low PTSD-B group' for males. Class 4 for males, consisted of 18.5% of male personnel and labelled the 'moderate with increased PTSD-C and low PTSD-B group' and was characterised moderate mean scores for

Anxiety and Depression, below moderate PTSD-B mean scores, high PTSD-C mean scores and moderate PTSD-D scores. Interestingly this group showed very mixed symptomology between cluster groups for PTSD, below moderate PTSD-B scores, high PTSD-C scores and moderate PTSD-D scores. MLR also revealed that this group were significantly more likely to be environmental trauma exposed in comparison to the reference class (1). Class 4 for females, consisted of the second joint largest group 28.4% of female personnel, and was characterised by moderate mean scores on Depression, Anxiety and PTSD and is labelled the 'moderate symptom group'. MLR revealed that this group were significantly more likely to be environmental and violent trauma exposed. Class 5 for males, was the smallest group and consisted of 6.4% of male personnel and was characterised by moderate mean scores on Depression, Anxiety and PTSD and is labelled the 'moderate symptom group'. Class 6 for males, consisted of 16.8% of male personnel, and was characterised by higher mean scores for Anxiety, Depression moderate PTSD–B, heightened PTSD-D and higher characterised scoring on PTSD-C and is labelled the 'heightened symptom group'. Like class 4, MLR revealed that this group were also significantly more likely to be environmental trauma exposed. Class 5 for females and class 7 for males were both labelled the 'high symptom group' and consisted of 10.3% of male personnel and 18.1% of female personnel. Both groups were characterised by the highest mean scores for Anxiety, Depression and PTSD. MLR revealed important distinctions between the two genders, female personnel were significantly more likely to be violent trauma exposed, male personnel however were significantly more likely to be environmental, and self – harm / death trauma exposed and have significantly less years of service in comparison to the reference class.

In the current study depression and anxiety were measured using the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) a 14-item self-rating questionnaire. Seven of the items relate to anxiety and seven relate to depression. The HADS is scored in two ways, using a total score cut-off method, where a summation of all item scores for the seven items relating to depression and the seven items relating to anxiety, scores between 11-21 (18-28 in the current study due to min-max observed scores) define someone as an abnormal case, 8-10 borderline abnormal (15-17 current study) for depression and anxiety respectively. The HADS scale employs the two cut-off points, one for the detection of 'possible' and one for the detection of 'probable' depressive or anxiety disorder. PTSD was measured using the Posttraumatic Stress Disorder Checklist – Civilian Version (PCL-C) a 17-item questionnaire (Weathers et al., 1994) based upon the Diagnostic and Statistical Manual of Mental Disorders-

IV (DSM-IV) criteria for PTSD (American Psychiatric Association, 1994). Item ratings of 3 or higher are considered symptomatic or clinically substantial. The PCL-C is scored in two ways, (1) a total score cut-off method, where a summation of all item scores greater than or equal to 51 defines someone as PTSD positive, and / or (2) a symptom cluster method, where DSM-IV criteria for PTSD are met based on DSM-IV criteria B, C, and D: requiring at least one cluster B item with a score of three or higher, plus at least three cluster C items with a score of three or higher, plus at least two cluster D items with a score of three or higher. In the current study the three symptom clusters were split from a total PTSD score in order to provide qualitative exploration into potential variation in the PTSD categories 'positive' thresholds and therefore a summation method was used via the scoring of the three clusters. Therefore scores (due to min-max observed values) of 15-25 were deemed symptomatic for PTSD-B, 21-35 symptomatic for PTSD-C and 15-25 were deemed symptomatic for PTSD-D.

The findings showed that overall male and female classes differed quantitively as well as qualitatively with distinct patterned symptom groups (higher and lower mean scoring groups as well as classes with anxiety and depression presence, without or with little presence or a criterion mixture of PTSD symptoms). The classes further differed between males and females in terms of typology of symptoms and their associations with the three factors of trauma (self-harm/death, violence, environmental) as measured by the PPTM. In order to provide some context to this, mean nonclinical cut off values of the HADS and PCL-C are further discussed to outline classes that maybe symptomatic. Caution however must be acknowledged with this approach, first and foremost the current study employed a self-report measurement methodology, therefore distinct clinical diagnosis assumptions between the classes cannot be made. However, it does help to provide a distinction between groups to contextualise and provide a basis for future research interests.

Male personnel differed quantitatively by the makeup of more complex symptomology varied classes as evidenced by the higher number of classes overall in comparison to females. Class 1 for males and females displayed no symptomology presence across the five symptom subsets. Class 2 for males and females displayed probable values for anxiety and possible values for depression and non-symptomatic values for PTSD categories. Class 3 for males and females displayed possible values for anxiety and non-symptomatic values for depression and PTSD categories. Class 4 for males and females displayed probable values for anxiety, possible values for depression and symptomatic values for PTSD-D (increased arousal), for males and females in class 4 demonstrating this pattern of symptomology they were more likely to be

environmental trauma exposed and females were also more likely to be violent trauma exposed. Class 5 for males displayed probable values for anxiety and symptomatic values for PTSD-B (intrusion and re-experiencing) and PTSD-D (increased arousal). Class 6 for males displayed probable values for anxiety and depression and symptomatic values for PTSD-B (intrusion and re-experiencing), C (emotional numbness and avoidance) and D (increased arousal). For males in class 6 demonstrating this pattern of symptomology they were more likely to be environmental trauma exposed. Class 7 for males and class 5 for females displayed probable values for anxiety and depression and symptomatic values for PTSD-B (intrusion and re-experiencing), C (emotional numbness and avoidance) and D (increased arousal) and were characterised by the highest scoring on the two scales. For males in class 7 demonstrating this pattern of symptomology they were more likely to be environmental and self-harm/death trauma exposed and have significantly less years of service. For females in class 5 demonstrating this pattern of symptomology they were more likely to be violent trauma exposed. These findings elucidated the results following the psychometric validation of the PPTM's predictive validity analysis. The results of which highlighted a possible indication of differential symptomology response patterns in respect to the typology of trauma exposure in male and female personnel. Exposure to self-harm and death appeared to be potentially problematic for male personnel as demonstrated in class 7. In respect to female personnel violent trauma exposure appeared to be potentially problematic as demonstrated in class 5 and class 4. Environmental trauma exposure appeared to be potentially problematic to both male and female personnel as demonstrated in class 7, 6 and 4 in males as well as class 4 in females. As well as these, certain classes did not present with significant associations with any typology of the three trauma factors of the PPTM but still displayed probable levels of symptomology. Class 2 in males and females and class 5 in males may be indicative that individuals within these classes were more susceptible to the joint accumulation of all 3 factors of trauma as opposed to one particular factor more frequently or as a higher isolated intensity incident.

Further to these findings both males and females were characterised by probable symptom comorbidity classes on all 5 outcome factors (anxiety, depression and PTSD – B, C and D) representing a significant subset of the overall sample (10.3% males, 18.1% females). Class 6 in males displayed the same probable symptom comorbidity on all 5 factors but was characterised by lower mean scores than class 7 but was significantly larger (16.8%) suggesting class 6 although demonstrating probable comorbidity may not have developed a fuller or severer extent of symptomology as class 7. Class 5 in males (6.4%) displayed probable

symptomology for Anxiety, PTSD-B and D but not C nor depression, however, this pattern of symptomology did not occur in females. PTSD-B (intrusion and re-experiencing) and PTSD-D (increased arousal) share similar correlational characteristics with Anxiety whereas PTSD-C (emotional numbness and avoidance) share correlational characteristics with Depression indicating that this class may have developed a more anxiety related severity of symptoms. Both males and females presented with a class that was characterised by probable symptomology for Anxiety and PTSD-D (18.5% males, 28.4% females). As with class 5 in males both outcomes are highly correlated and indicative of a more anxiety related severity of symptoms. Both males and females further presented with a class that was characterised by possible borderline symptomology for Anxiety (26.2% males, 28.4% females). Both males and females also presented with a class that was characterised by probable symptomology for Anxiety and possible for Depression (7.6% males, 9.7% females). Lastly both males and females also presented with a class that was characterised by no threshold symptomology for any of the 5 outcomes (14.2% males, 15.4% females). The symptomatology sub sets within the classes indicate anxiety in particular is particularly prevalent across most classes in both males and females as well as in conjunction with PTSD-B and D symptom clusters, and all outcomes comorbidly, depression in contrast does not occur in isolation but occurs comorbidly in the highest symptom severity classes with PTSD and anxiety.

The PPTM utilises items to measure environmental trauma, such as working isolated for long periods of time with prisoners and working in areas with low visibility between staff where prisoners are. It also measures elements that are more unusually encountered, such as prisoners using excrement in protest or arson, involving the setting of fires within their cells. There is some evidence (Liebling & Price, 2001; Crawley, 2004) that the latter two items are predominately dealt with by a larger majority of male personnel working within segregation units (isolation wings which used to be called solitary confinement used for disruptive and fragmented prisoners). The experience of working isolated and in areas of low visibility however appears endemic and consequential to both genders. Violent trauma exposure is measured by items that utilise questions regarding the witnessing and experiencing of violence as well as intimidation and appears to be more consequential on the development of comorbid symptomology amongst female personnel than males. In contrast the experiencing of witnessing self-harm behaviour and suicide as measured by the PPTM self-harm/death trauma factor appears more consequential to higher symptomology in male personnel with less working experience in a prison environment as opposed to female personnel. Again, this may

be accounted for by predominately higher numbers of male personnel working within segregation units in male prisons where a higher number of these incidents occur as opposed to the general population (Liebling & Price, 2001; Crawley, 2004).

Evidence is presented within the current study that supports previous findings (Konda et al., 2013; Schlosser et al., 2010; Spinaris et al., 2012; Denhof & Spinaris, 2016) that prison work is traumatic and prison personnel are at significant risk of trauma exposure. The current findings support previous work that frontline staff are particularly at risk in relation to other prison personnel (Denhof & Spinaris, 2013; Obidoa et al., 2011; Spinaris et al., 2012; Stadnyk, 2003). Furthermore, the current study supports previous findings that show PTSD, depression and anxiety comorbidity may be particularly problematic amongst prison personnel (Spinaris et al., 2012; Denhof & Spinaris, 2013; Denhof et al., 2014) as opposed to PTSD, depression or anxiety in isolation (Denhof & Spinaris, 2013). Furthermore, the current study supports previous research that has found comorbid PTSD symptomology patterns, (Brady et al., 2000; Ginzburg et al., 2010; Galatzer-Levy et al., 2013) and studies that demonstrate these effects rarely occur in isolation in individuals exposed to trauma (Kozari´c-Kovaci´c et al., 2001; Orsillo et al., 2002). Furthermore, evidence for the presence of subthreshold PTSD is demonstrated in the current sample, which supports previous findings (Helzer et al., 1987; Stein et al., 1997; McLaughlin et al., 2015) suggesting its possible clinical relevance and associations with impairment (Marshall et al., 2001; Cukor et al., 2010) and its potential larger prevalence amongst trauma exposed occupations than PTSD alone (Maia et al., 2007; Marmar et al., 2006). Higher mean levels of PTSD symptomology were also found in the current study supporting research suggesting higher levels are more prevalent amongst occupations whose roles entail a higher risk of trauma exposure, (Perrin et al., 2007; Corneil et al., 1999; Fulton et al., 2015). PTSD comorbidity is also demonstrated in the current study amongst prison personnel in line with similar occupations that have found high levels of comorbidity, (Jones et al., 2018; Petrie et al., 2018). More specifically, evidence is presented that supports and elucidates the occurrence of PTSD comorbidity findings amongst prison personnel (Spinaris et al., 2012; Denhof & Spinaris, 2013; Denhof et al., 2014). The current study also demonstrates that factors of trauma typology may be relevant and linked to higher numbers of comorbid disorders, particularly those involving interpersonal violence (Foa et al., 1999; Roth et al., 1997; Leskin, 2002; Rees, 2011) as demonstrated in the current sample in the case of female personnel with exposure to violent trauma, and with supporting studies indicating the relevance of interpersonal violence being problematic with comorbidity development in prison personnel

(Boudoukha et al., 2013). The disparity in associations between male and female personnel may indicate that certain personnel may be more resilient and / or develop better coping mechanisms to certain adverse outcomes than others. However, because of a significant lack of previous research within the prison literature surrounding these considerations only a speculative assumption to these variabilities and potential causes can be made, however it does further demonstrate the ability of the PPTM to potentially indicate the variabilities in these factors and therefore highlight areas that warrant significant further research attention.

The significant strengths of the current study lie in the utilization of a large sample of prison personnel, an often limited accessed and under researched trauma exposed population. The division of PTSD symptomology clusters is arguably a further significant strength providing elucidation on which particular symptom clusters are more prevalent in conjunction with trauma typology and patterns of comorbidity with other symptom clusters, as well as comorbidity with anxiety and depression. It is further proposed that the current study provides support for the use of the PPTM amongst prison personnel populations alongside the use of clinical or established self-report measures for PTSD, anxiety and depression in order to identify individuals or sub-sets of personnel who may be at risk for the development of psychological illnesses in association to particular typologies of trauma exposure.

4.4.1 Limitations of current research and further directions

Despite the strength of the present findings, there are several potential limitations to the current study. As indicated previously the use of self-report measures and rating scales, and the current study being based on data from prison personnel in England and Wales only and as such the need to generalise findings in other samples. Future studies harnessing a longitudinal nature should be undertaken to ascertain a causational link between the variables in this study and the development of, rather than presence of trauma exposure and its development with PTSD comorbidity. Moreover, further consideration of prison category from minimum to maximum security facilities, could be utilized for analysis as well. The current study utilised the PCL-C (Weathers et al., 1994) which maps directly onto DSM-IV diagnostic criteria for PTSD however, future studies should utilise the PCL-5 (Weathers et al., 2013) which maps directly onto DSM-V diagnostic criteria. The PCL-5 can be used to elucidate further investigation into complex PTSD, as it allows the sub categorisation classification of the disorder, namely the addition of NACM (negative alterations of cognition and mood) symptoms as well as the current, intrusion, avoidance, and hyper-arousal symptomology. Complex PTSD has been shown to be particularly problematic for cohorts of chronically

trauma exposed individuals (Shevlin et al., 2017) and may be of consideration to chronically trauma exposed occupations.

4.4.2 Conclusions

In spite of the limitations listed above, the current study provides a significant contribution to the area of trauma exposure and PTSD comorbidity, particularly in prison context specific populations and further elucidates findings in previous research for disparity in PTSD comorbidity that suggests several mechanisms may account for its development. The current study supports evidence for several of these factors and that depression and anxiety may increase the risk of developing PTSD; or PTSD may be a casual risk factor to the development of anxiety and depression; or the observed comorbidity may be attributed to symptom overlap, or PTSD, anxiety and depression may share commonalities of risk factors and still remain independent disorders (Breslau, 2002; O'Donnell et al., 2004). The findings overall elucidate important distinctions between patterns of PTSD, anxiety, and depression comorbidity in trauma exposed occupational groups. As well as important differences in the relationship of trauma exposure typology and comorbidity symptomology between male and female prison personnel. Despite previous research identifying comorbidity of PTSD, anxiety, and depression, amongst prison personnel the current study is the first of its kind to profile prison personnel by symptomology and assess associations of typologies of trauma unique to working in a prison environment.

CHAPTER FIVE:

The Moderating Role of Prison Personnel Years of Service in the Relationship between Trauma and PTSD

Abstract

Objective: The aim of this chapter was to investigate the moderating role of prison personnel's years of service working within a prison environment, on the relationship between the three trauma factors (self-harm/death, violent, environmental) measured by the Prison Personnel Trauma Measure (PPTM) and PTSD symptomology.

Method: The Prison Personnel Trauma Measure (PPTM), Hospital Anxiety and Depression Scale (HADS) and the Posttraumatic Stress Disorder Checklist – Civilian Version (PCL-C) were administered to 1995 Prison Personnel in England and Wales, using non-probability convenience sampling, from personnel serving in (N = 123 Prison's, ranging from High to Low Security, housing Adult Male and Female (21+), Young Offenders (18-21) and Juvenile (under 18's) Prisoners.

Results: Differential associations were identified between years of service, trauma and PTSD. Results showed specifically that years of service significantly moderated the relationship between violent trauma exposure and PTSD. Furthermore, it was identified this moderation occurred specifically in male personnel with higher years of service but not in female personnel. Years of service was not found to moderate the relationship between self-harm/death or environmental trauma exposure and PTSD in male or female personnel.

Conclusion: The findings clarify linkages among years of service, trauma and PTSD, and elucidates which types of trauma exposure may be moderated by years of service within a prison environment. Implications for PTSD symptomology development are discussed. It is also suggested that future studies may advance the understanding of the mechanisms of the relationship between trauma exposure in prison and potential moderating factors on the development of PTSD, Anxiety, and Depression.

5.1 INTRODUCTION

Trauma exposure and the subsequent development of adverse psychological illness such as PTSD, Anxiety and Depression is a key consideration in trauma exposed occupations (Perrin et al., 2007; Corneil et al., 1999; Fulton et al., 2015). Working in a prison environment can induce both stress and trauma (Johnson et al., 2005; Spinaris et al, 2012; Denhof & Spinaris, 2013; Boudoukha et al., 2013; Denhof et al., 2014; Kinman et al., 2014) with PO's being routinely exposed directly and indirectly, to potentially traumatic incidents (Konda et al., 2013) in high magnitudes (Spinaris et al., 2012). Repeated exposure to trauma has been linked to an increased risk for the development of PTSD and comorbid psychological illness (Herman, 1997; Ford et al., 2001) as well as increasing the risk for full development of PTSD following re-traumatisation (Cukor et al., 2010; Smid, Mooren, van der Mast, Gersons, and Kleber, 2009).

In considering this, research has been carried out to identify potential moderators of trauma symptomology and trauma exposure in risk associated occupations, pre-dominantly amongst military personnel. Several varied factors have been found to moderate levels of subsequent symptomology after exposure to potential trauma. Findings suggest that morale may buffer soldiers from the negative consequences of combat stressors (Britt, Adler, Bliese, & Moore, 2013). Emotion-focused coping strategies which involve attempts to manage emotions experienced as a result of an environmental stressor, such as by reappraising the stressor or accepting the stressor as part of the present reality (Lazarus & Folkman, 1984) have been considered as moderators, positive emotion-focused coping has moderated soldiers from the adverse effects of combat exposure, and subsequent development of PTSD symptoms (Britt, Adler, Sawhney, & Bliese, 2017). Furthermore, amongst military personnel greater resilience (Fincham, Altes, Stein, & Seedat, 2009), social support (Cluver, Fincham, & Seedat, 2009), and hardiness (Bartone, 1999) have been found to have a negative correlation with the severity of combat exposure and PTSD symptomology. Eschleman, Bowling, and Alarcon (2010) have reported hardiness moderating the association between stressors and adverse psychological symptoms which were found to weaken greater levels of hardiness. Higher resilience levels amongst firefighters have been found to significantly moderate the impact of direct and indirect exposure of traumatic stress (Lee et al., 2014). Personality traits, in particular extraversion, have also been shown to moderate PTSD symptoms amongst individuals in respect to war trauma, some research has also documented that low neuroticism (Lauterbach & Vrana, 2001) weakens the association between severity of combat experiences and severity

of PTSD, indicating that personality traits may be an important risk/resiliency factor to consider in people's responses to traumatic events (Caska & Renshaw, 2013). Psychopathy has also been found to moderate the relationship of combat exposure with PTSD, symptomology decreased as rates of interpersonal-affective psychopathic traits increased. Impulsive-antisocial traits were also found to moderate the association between combat experience and PTSD, interestingly there was also a similar decrease in magnitude with higher levels of these traits. The findings suggest that particular components of psychopathy may serve as protective factors against the development of PTSD symptomatology within military personnel (Anestis, Harrop, Green, & Anestis, 2017). Similar studies amongst criminal offender's support findings that the interpersonal affective component of psychopathy is potentially protective against the development of PTSD (Willemson, De Ganck & Verhaeghe, 2012; Sellbom, 2015; Woodfield, Dhingra, Boduszek & Debowska, 2016). Despite findings that suggest repeated trauma exposure may lead to an increased risk for the development of PTSD and comorbidity (Herman, 1997) research has found in certain individuals' exposure to repeated trauma may increase resilience; whereas the reverse can also be true and has been termed the "steeling effect" (Figley, 1985, 1986; Wilson, 1989, 1995; Wilson & Raphael, 1993; Wilson & Drozdek, 2004).

Within risk associated occupations occupational experience may be a potentially overlooked moderator that may impede the development of PTSD and comorbidity following repeated trauma exposure. Experience in this context is defined by 'time in service or position' within a role and / or organisation, as opposed to the experience of repeated trauma. There is a significant absence of such considered research within the PTSD literature, particularly in relation to trauma exposed occupations, considering time of service as a potential moderator, and in particularly amongst prison personnel. Some studies however have found associations between burnout (Maslach, 1982) and levels of experience amongst PO's, Morgan et al. (2002) found less experienced officers reported higher levels of emotional exhaustion and depersonalisation, Harizanova & Tarnovska, (2013) have found younger and more inexperienced staff to have the highest levels of burnout in comparison to experienced officers. Other studies suggest that habituation in a professional occupational capacity may increase resilience and hardiness to trauma exposure amongst occupational cohorts such as police officers through the effects of 'police culture'. Police culture is a concept that proposes officers create a 'taboo' effect surrounding trauma exposure and development of psychological illness by not wishing to appear weak or unable to cope in front of colleagues (Papazoglou, 2013). However, such mechanisms of coping may also be detrimental and could affect the likelihood

of developing PTSD because individuals may not face the symptoms of PTSD and deal with them effectively, thus exacerbating the symptomology (Violanti et al., 2013) a similar effect may also occur in PO's due to the high similarity and overlap of the two occupations.

The identification of personnel who for a number of possible factors show lower levels of, or no symptomology following repeated trauma exposure overtime may warrant further attention to ascertain if resilience and / or hardiness is potentially developed with occupational experience, or whether these potential protective variables remain independent of experience. Studies of "at risk" populations (Dugan & Coles, 1989), especially those who do not develop PTSD, or comorbid disorders are relevant to the understanding of what constitutes optimal functioning in individuals following trauma exposure, extreme stress, and adversity in life (Folkman & Moskowitz, 2000; Fredrickson et al., 2003).

Felsman and Vaillant (1982, p. 313) have long since highlighted "the task of predicting resiliency is complicated because there is no universally defined concept of what constitutes resilient behaviour. In some cases, resiliency is defined by the absence of psychopathology, prolonged stress response patterns (e.g., PTSD), or maladaptive coping. In other cases, resilience is defined by having superior coping, on average, over a longitudinal course of life-span development. In some studies, resilience is also defined as a personality variable (e.g., locus of control, ego resilience, hardiness) that is presumed to moderate outcome variables."

5.1.1 The current study

In consideration of a lack of research amongst trauma exposed occupations surrounding the possibility that years of occupational experience may serve as a potential moderator for the development of PTSD. The aim of this chapter was to address these limitations through the use of moderated regression analysis in order to test the ability of occupational experience measured by 'years of service' to moderate the effects of the three trauma factors (self-harm/death, violent, environmental trauma exposure) measured by the PPTM on PTSD symptomology amongst a sample of UK based prison personnel. A further aim was to test this moderation in male and female sample separately.

5.2 METHOD

5.2.1 Participants and Procedure

A total of *N* =1995 prison personnel responded and returned completed surveys. Due to some of the returned surveys having significant missing data *N* = 1562 respondents were included in the final analysis. The sample consisted of *n* = 948 male and *n* = 614 female participants (for full description of the sample and sampling procedures please see Chapter 2 Methodology, Section 2.2 and Sub Section 2.2.4)

5.2.2 Measures

The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983); The Posttraumatic Stress Disorder Checklist – Civilian Version (PCL-C; Weathers et al., 1994); Prison Personnel Trauma Measure were administered to all participants (for full description of the measures utilised please see Chapter 2 Methodology, Section 2.3 and Sub Section 2.3.1 to 2.3.4).

5.2.3 Analytical Procedures

Descriptive statistics, correlation coefficients, and moderated regression was calculated using SPSS 22 (for a full description of the moderated regression procedure please see Chapter 2, 2.5.3.3). A hierarchical moderated multiple regression analysis was applied to investigate the moderating role of years of service in the relationship between the three PPTM factors of trauma (self-harm/death, violent, environmental) and PTSD, MRA being the recommended method for testing interaction effects (Cohen & Cohen, 1983). The standardised solutions are reported for both male and female participants. Interactions were also plotted in order to provide correct interpretation as suggested by Boduszek et al. (2014); Boduszek et al. (2012); Cohen et al. (2003). Simple slopes for the relationship between trauma and PTSD were then compared for “high” levels of the moderator (years of service) (1 SD above the M, medium (M) and “low” levels of the moderator (1 SD below the M) using ModGraph 3.0 (Jose, 2013).

5.3 RESULTS

Descriptive Statistics and correlations

Means (*M*) and standard deviations (*SD*) for age, years of service, self – harm / death, violent and environmental trauma exposure, anxiety, depression and PTSD are presented in Table 5.1 together with bivariate correlations. Results indicate significant positive associations between the number of traumatic events experienced, types of trauma, years of service, anxiety, depression, PTSD. Significant positive associations were observed between self – harm / death, violent trauma exposure and age of participants. Significant negative associations were also observed between high anxiety scores and lower scores on age and years of service.

Table 5.1 Descriptive statistics and correlations for Age, Years of Service, Death / Self – Harm Trauma, Violent, Environmental Trauma Exposure, Anxiety, Depression and PTSD**.**

Variable	**Age**	**Exp**	**D / SH**	**VT**	**ET**	**Anx**	**Dep**	**PTSD**
Age	1							
YofS	.76***	1						
D /SH	.09***	.18***	1					
VT	.05*	.16***	.78***	1				
ET	.03	.12***	.56***	.61***	1			
Anx	-.09***	-.08**	.20***	.23***	.23***	1		
Dep	.03	.04	.19***	.21***	.23***	.67***	1	
PTSD	-.00	-.01	.27***	.29***	.25***	.70***	.59***	1
M	43.08	14.25	9.02	21.24	9.76	44.67	18.49	15.32
SD	10.76	8.58	2.14	4.24	2.58	17.52	4.46	4.27
Min	19	1	3	8	4	17	7	7
Max	71	43	12	32	16	85	28	28

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

Moderated Regression Analysis (full sample)

Hierarchical moderated regression analysis was performed to investigate the moderating effect of years of service on the relationship between self – harm / death, violent and environmental trauma exposure and PTSD symptoms. Preliminary analyses revealed no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. Multicollinearity was assessed via the tolerance statistic and variance inflation factor (VIF). The tolerance values were greater than 0.10 and the VIF values were below 10 as suggested acceptable (Tabachinck & Fidell, 2013) therefore, as the obtained values did not meet the thresholds set this suggested multicollinearity was unlikely to be a cause for concern. Full sample, PTSD, Anxiety, Depression; Tolerance Value (Self-Harm/Death; .37; Violent; .34; Environmental; .61; Years of Service; .97) VIF (Self-Harm/Death; 2.68; Violent; 2.95; Environmental; 1.64; Years of Service; 1.03).

In the first step of the analysis, the three PPTM factors of trauma exposure and years of service were entered. This model (model 1) was statistically significant ($F_{(4, 1475)} = 41.24$, $p < .001$) and explained 10% ($R^2 = .10$) of variance in PTSD. All three PPTM trauma exposure factors and years of service made a significant contribution to the model (see table 5.2). The second step of the analysis consisted of entering interaction terms, coding the interaction between the three PPTM trauma exposure factors and years of service. This model (model 2) was also statistically significant ($F_{(7, 1472)} = 25.18$, $p < .001$) and explained 11% ($R^2 = .11$) of variance in PTSD symptoms. All three PPTM factors, years of service, and the interaction between Experience and Violent trauma made a significant contribution to the model (see table 5.2). In the final model (model 3) age, anxiety and depression were added to model 2. The model explained 55% of variance in PTSD symptoms ($R^2 = .55$; $F_{(10, 1469)} = 176.13$, $p < .001$). Just as in model 2, violent trauma exposure and self-harm / death trauma exposure formed a statistically significant direct relationship with PTSD symptoms as well as, age, anxiety and depression. There was no significant direct relationship between environmental trauma exposure and PTSD symptoms. However, the relationship of the interaction term (years of service by violent trauma) and PTSD symptoms was statistically significant, indicating that the effect of violent trauma exposure on PTSD symptoms depends on years of service.

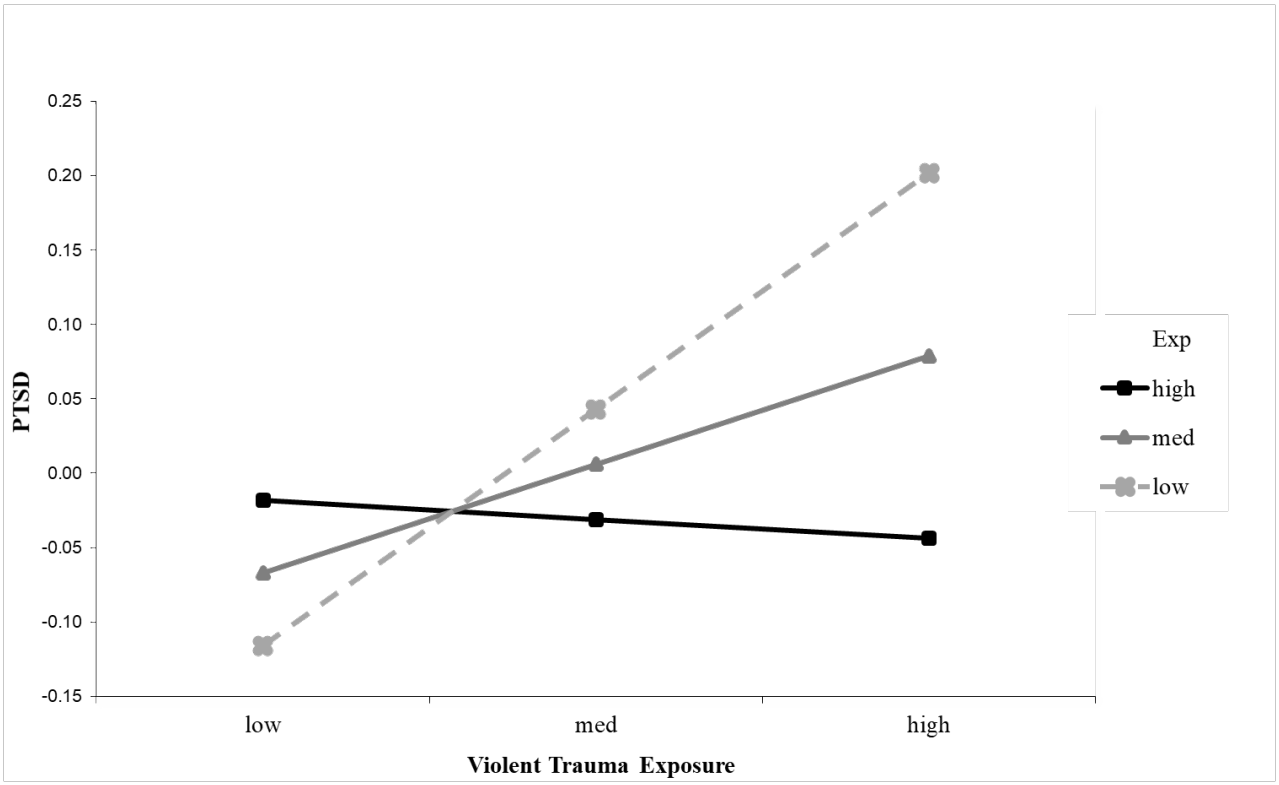
Table 5.2 Moderated effect of Years of Service on relationship between three PPTM factors and PTSD while controlling for Age, Anxiety, and Depression.

Model	Variable	*β*	*SE*	95% CI
1	Self – Harm / Death Trauma (SH / DT)	.09*	.04	.01/.17
	Violent Trauma (VT)	.17***	.04	.09/.25
	Environmental Trauma (ET)	.11**	.03	.05/.17
	Years of Service	-.06*	.03	-.11/-.01
2	Self – Harm / Death Trauma	.08*	.04	.00/.16
	Violent Trauma	.17***	.04	.08/.25
	Environmental Trauma	.12***	.03	.05/.18
	Years of Service	-.06*	.03	-.11/-.01
	YofS by SH / DT	.07	.04	-.01/.15
	YofS by VT	-.10*	.04	-.19/-.02
	YofS by ET	-.03	.03	-.09/.03
3	Self – Harm / Death Trauma	.06*	.03	.00/.12
	Violent Trauma	.07*	.03	.01/.13
	Environmental Trauma	.01	.02	-.04/.06
	Years of Service	-.04	.03	-.09//02
	YofS by SH / DT	.05	.03	-.01/.11
	YofS by VT	-.08*	.03	-.15/-.03
	YofS by ET	-.01	.02	-.06/.03
	Age	.06*	.03	.00/.11
	Anxiety	.54***	.02	.49/.58
	Depression	.21***	.02	.16/.25

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

Simple slopes for the relationship between violent trauma exposure and PTSD symptoms were investigated for low (1 SD below the mean), medium (mean), and high (1 SD above the mean) years of service (see Figure 5.1). Violent trauma exposure was positively associated with PTSD symptoms for low levels (-1 SD) of years of service ($\beta = .16$, $SE = .04$, $p < .001$). A significant positive association between violent trauma exposure and PTSD symptoms was also found for medium (mean) years of service ($\beta = .07$, $SE = .03$, $p = .02$). The association between variables for high (+1SD) years of service and violent trauma exposure and PTSD symptoms was non-significant ($\beta = -.01$, $SE = .04$, $p = .77$).

Figure 5.1 The moderating role of years of service (experience) on the relationship between violent trauma exposure and PTSD symptomology.



Moderated Regression Analysis (male sample)

Hierarchical moderated regression analysis was performed to investigate the moderating effect of years of service on the relationship between self – harm / death, violent and environmental trauma exposure and PTSD symptoms among males. Preliminary analyses revealed no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. Multicollinearity was assessed via the tolerance statistic and variance inflation factor (VIF). The tolerance values were greater than 0.10 and the VIF values were below 10 as suggested acceptable (Tabachinck & Fidell, 2013) therefore, as the obtained values did not meet the thresholds set this suggested multicollinearity was unlikely to be a cause for concern. Male sample, PTSD, Anxiety, Depression; Tolerance Value (Self-Harm/Death; .41; Violent; .36; Environmental; .65; Years of Service; .99) VIF (Self-Harm/Death; 2.42; Violent; 2.80; Environmental; 1.53; Years of Service; 1.01).

In the first step of the analysis, the three PPTM factors of trauma exposure and years of service were entered. This model (model 1) was statistically significant ($F_{(4, 885)} = 21.53$, $p < .001$) and explained 9% ($R^2 = .09$) of variance in PTSD. Self-harm / death and environmental trauma exposure factors made a significant contribution to the model (see table 5.3). The second step of the analysis consisted of entering interaction terms, coding the interaction between the three PPTM trauma exposure factors and years of service. This model (model 2) was also statistically significant ($F_{(7, 882)} = 13.62$, $p < .001$) and explained 10% ($R^2 = .10$) of variance in PTSD symptoms. Self-harm / death and environmental trauma exposure factors and the interaction between years of service and Violent trauma made a significant contribution to the model (see table 5.3). In the final model (model 3) age, anxiety and depression was added to model 2. The model explained 55% of variance in PTSD symptoms ($R^2 = .55$; $F_{(10, 879)} = 108.69$, $p < .001$). Just as in model 2, self-harm / death trauma exposure formed a statistically significant direct relationship with PTSD symptoms as well as anxiety and depression. There was no significant direct relationship between environmental trauma exposure and PTSD symptoms. However, the relationship of the interaction term (years of service by violent trauma) and PTSD symptoms was statistically significant, indicating that the effect of violent trauma exposure on PTSD symptoms in males depends on years of service.

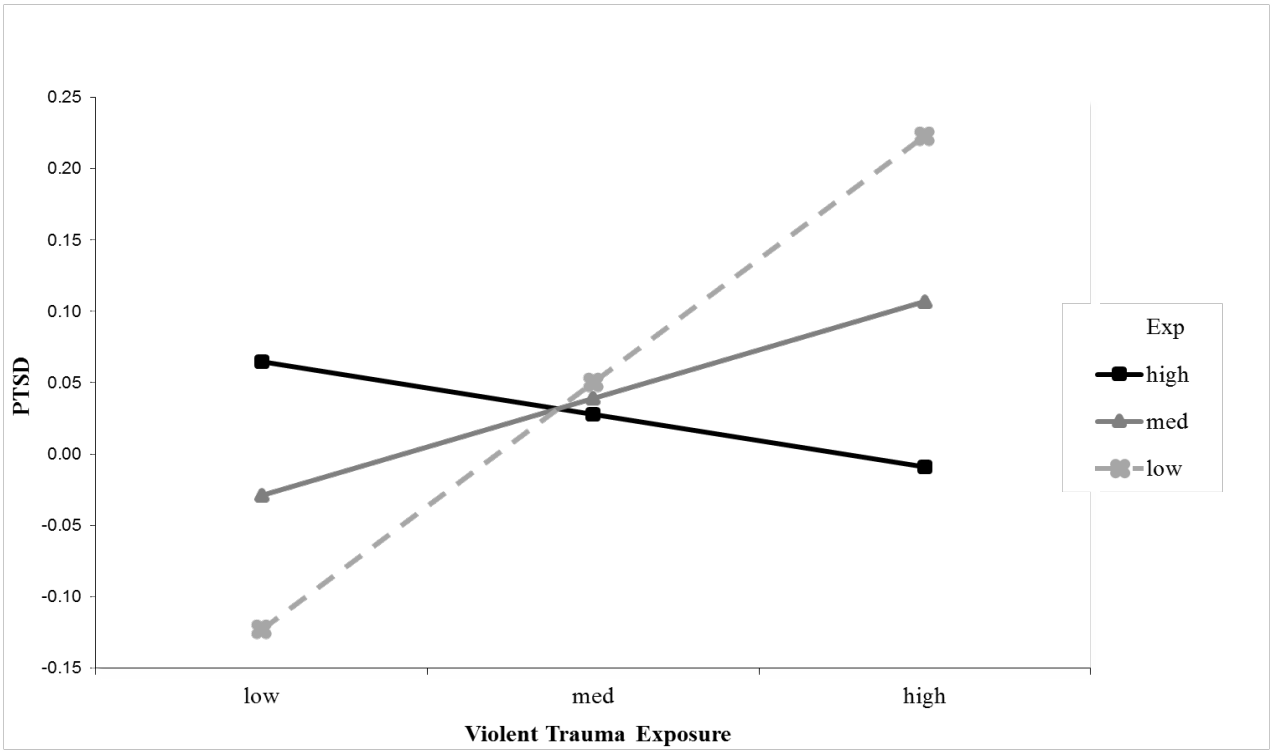
Table 5.3 Moderated effect of Years of Service on relationship between three PPTM factors and PTSD while controlling for Age, Anxiety, and Depression in males.

Model	Variable	*β*	*SE*	95% CI
1	Self – Harm / Death Trauma (SH / DT)	.17***	.05	.07/.29
	Violent Trauma (VT)	.08	.06	-.03/.20
	Environmental Trauma (ET)	.10*	.04	.02/.19
	Years of Service	-.04	.03	-.10/.02
2	Self – Harm / Death Trauma	.15**	.06	.06/.28
	Violent Trauma	.10	.06	-.01/.22
	Environmental Trauma	.11**	.04	.03/.20
	Years of Service	-.04	.03	-.10/.03
	YofS by SH / DT	.07	.05	-.04/.17
	YofS by VT	-.12*	.06	-.24/-.01
	YofS by ET	-.03	.04	-.11/.05
3	Self – Harm / Death Trauma	.10**	.04	.03/.19
	Violent Trauma	.06	.04	-.02/.15
	Environmental Trauma	-.02	.03	-.08/.04
	Years of Service	-.01	.03	-.08//06
	YofS by SH / DT	.04	.04	-.03/.11
	YofS by VT	-.10*	.04	-.19/-.03
	YofS by ET	-.00	.03	-.06/.05
	Age	.05	.04	-.02/.13
	Anxiety	.54***	.03	.49/.62
	Depression	.21***	.03	.15/.27

Note*:* * $p < .05$; ** $p < .01$; *** $p < .001$

Simple slopes for the relationship between violent trauma exposure and PTSD symptoms were investigated for low (1 SD below the mean), medium (mean), and high (1 SD above the mean) years of service (see Figure 5.2). Violent trauma exposure was positively associated with PTSD symptoms for low (-1 SD) years of service ($\beta = .17$, $SE = .04$, $p < .001$). A significant positive association between violent trauma exposure and PTSD symptoms was also found for medium (mean) years of service ($\beta = .07$, $SE = .03$, $p = .03$). The association between variables for high (+1SD) years of service and violent trauma exposure and PTSD symptoms was non-significant ($\beta = -.04$, $SE = .04$, $p = .41$).

Figure 5.2 The moderating role of years of service (experience) on the relationship between violent trauma exposure and PTSD symptomology in males.



Moderated Regression Analysis (female sample)

Hierarchical moderated regression analysis was performed to investigate the moderating effect of years of service on the relationship between self – harm / death, violent and environmental trauma exposure and PTSD symptoms among females. Preliminary analyses revealed no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. Multicollinearity was assessed via the tolerance statistic and variance inflation factor (VIF). The tolerance values were greater than 0.10 and the VIF values were below 10 as suggested acceptable (Tabachinck & Fidell, 2013) therefore, as the obtained values did not meet the thresholds set this suggested multicollinearity was unlikely to be a cause for concern. Female sample, PTSD, Anxiety, Depression; Tolerance Value (Self-Harm/Death; .34; Violent; .34; Environmental; .58; Years of Service; .94) VIF (Self-Harm/Death; 2.97; Violent; 2.96; Environmental; 1.72; Years of Service; 1.07).

In the first step of the analysis, the three PPTM factors of trauma exposure and years of service were entered. This model (model 1) was statistically significant ($F_{(4, 585)} = 20.50$, $p < .001$) and explained 12% ($R^2 = .12$) of variance in PTSD. Violent and environmental trauma exposure factors and years of service made a significant contribution to the model (see table 5.4). The second step of the analysis consisted of entering interaction terms, coding the interaction between the three PPTM trauma exposure factors and years of service. This model (model 2) was also statistically significant ($F_{(7, 582)} = 11.97$, $p < .001$) and explained 13% ($R^2 = .13$) of variance in PTSD symptoms. Violent and environmental trauma exposure factors and years of service again made a significant contribution to the model (see table 5.4). In the final model (model 3) age, anxiety and depression was added to model 2. The model explained 54% of variance in PTSD symptoms ($R^2 = .55$; $F_{(10, 579)} = 68.85$, $p < .001$). Just as in model 2, years of service formed a statistically significant direct relationship with PTSD symptoms as well as anxiety and depression. There was no significant direct relationship between all three PPTM trauma exposure factors and PTSD symptoms. The relationship of the interaction term (years of service by violent trauma) and PTSD symptoms was not statistically significant, indicating that the effect of violent trauma exposure on PTSD symptoms in females is not dependent on years of service.

Table 5.4 Moderated effect of years of service on relationship between three PPTM factors and PTSD while controlling for Age, Anxiety, and Depression in Females.

Model	Variable	*β*	*SE*	95% CI
1	Self – Harm / Death Trauma (SH / DT)	-.04	.06	-.15/.09
	Violent Trauma (VT)	.29***	.06	.14/.38
	Environmental Trauma (ET)	.13*	.05	.03/.22
	Years of Service	-.09*	.05	-.19/-.01
2	Self – Harm / Death Trauma	-.03	.06	-.16/.09
	Violent Trauma	.27***	.07	.12/.37
	Environmental Trauma	.12*	.05	.02/.22
	Years of Service	-.10*	.05	-.20/-.02
	YofS by SH / DT	.03	.07	-.10/.17
	YofS by VT	-.06	.07	-.19/.08
	YofS by ET	-.03	.06	-.14/.07
3	Self – Harm / Death Trauma	.01	.05	-.08/.10
	Violent Trauma	.07	.05	-.03/.10
	Environmental Trauma	.05	.04	-.02/.12
	Years of Service	-.10*	.05	-.21//-.02
	YofS by SH / DT	.06	.05	-.04/.15
	YofS by VT	-.10	.05	-.19/.01
	YofS by ET	-.01	.04	-.09/.07
	Age	.05	.04	-.03/.13
	Anxiety	.52***	.04	.43/.58
	Depression	.21***	.04	.14/.29

Note*:* * $p < .05$; ** $p < .01$; *** $p < .001$

5.4 DISCUSSION

The aim of this chapter was to explore the potential of occupational experience measured by 'years of service' to moderate the effects of PTSD symptomology following exposure to self-harm/death, violent, and environmental trauma as measured by the Prison Personnel Trauma Measure (PPTM) with a further aim being to identify the typology of trauma factor, and to draw comparisons between male and female participants, within a sample of UK based prison personnel.

Hierarchical moderated regression analysis was performed to investigate the moderating effect of years of service on the relationship between self – harm / death, violent and environmental trauma exposure and PTSD symptoms. Three models were tested whilst controlling for specific variables *(age, anxiety and depression)*. Firstly, the three PPTM factors of trauma exposure and years of service were entered. All three PPTM trauma exposure factors and years of service made a significant contribution to the model. Secondly, interaction terms were entered into the model between the three PPTM trauma exposure factors and years of service. All three PPTM factors and years of service and the interaction between years of service and violent trauma made a significant contribution to the model. Lastly, age, anxiety and depression were added to model 2, and in model 3 violent trauma exposure and self-harm / death trauma exposure led to a direct relationship with PTSD symptoms which was statistically significant. No direct relationship of statistical significance was found between environmental trauma exposure and PTSD symptoms. However, the relationship of the interaction term (years of service by violent trauma) and PTSD symptoms was statistically significant, indicating that the effect of violent trauma exposure on PTSD symptoms depends on years of service. In the next stage of the analysis hierarchical moderated regression analysis was again used, this time in the sample of male participants. Three models were again tested with the same interaction terms and controlled variables. Again, firstly the three PPTM factors of trauma exposure and years of service were entered, self-harm / death and environmental trauma exposure factors made a significant contribution to the model. Secondly when interaction terms were entered into the model self-harm / death and environmental trauma exposure factors and the interaction between years of service and violent trauma made a significant contribution to the model. Lastly when age, anxiety and depression were added self-

harm / death trauma exposure formed a statistically significant direct relationship with PTSD symptoms. There was no significant direct relationship between environmental trauma exposure and PTSD symptoms. However, the relationship of the interaction term (years of service by violent trauma) and PTSD symptoms was statistically significant, indicating that the effect of violent trauma exposure on PTSD symptoms in males also depends on years of service. In the final analysis the data from the sample of female participants was used. As with the former two stages three models were again tested. Firstly, Violent and environmental trauma exposure factors and years of service made a significant contribution to the model. Secondly, when interaction terms were entered it was found Violent and environmental trauma exposure factors and years of service again made a significant contribution to the model. Lastly, when age, anxiety and depression were added there was no significant direct relationship between all three PPTM trauma exposure factors and PTSD symptoms. Importantly, the relationship of the interaction term (years of service by violent trauma) and PTSD symptoms was not statistically significant, indicating that the effect of violent trauma exposure on PTSD symptoms in females does not depend on years of service.

The findings show that PTSD symptomology was moderated by years of service but only in regard to violent trauma exposure in male prison personnel as opposed to female personnel, furthermore no significant association between years of service and PTSD symptoms were found for the other two trauma factors in male or female personnel. Therefore, greater years of service in male prison personnel moderate the effects of PTSD development when they have been exposed to trauma involving the witnessing or perpetration of violence whereas male personnel with less years of service and female personnel in general exposed to the three trauma factors are unable to replicate this moderation.

As highlighted previously there is an absence of research exploring the factor of occupational experience as a potential moderator for the development of PTSD symptomology. The findings of the current study elucidate this consideration and provide a significant contribution to the PTSD literature.

The findings support previous research that suggest prison personnel may be at risk of developing adverse psychological symptomology such as PTSD as well as burnout as a result of exposure to trauma with limited occupational experience (Harizanova & Tarnovska, 2013; Morgan et al., 2002). This is an important overall consideration for the organisational structures of prison systems, where wide scale hiring of younger PO's to replace experienced PO's (Jauvin et al., 2003) initiated by central governments to provide more cost effective public

services have led to higher absenteeism rates, turnover, lower staff retention, and stress amongst the workplace, alongside increases in violence, self-harm and suicide rates (Ministry of Justice, 2018) as a result of rapid and erroneous implementations of new policies. The findings of the current study may help to provide further clarification of these considerations. Adverse symptomology development following trauma exposure amongst inexperienced and female officers mean staff who are affected could leave service because they are unable to potentially harden or develop resilience mechanisms to the trauma exposure or it may be the case they are being exposed to greater magnitudes of high event exposures that are normally associated with greater years of service . The prison service of England and Wales, has reported a loss of 596 PO's in 2016 and 1244 in 2018 an increase of 109%, 1 in 16 officers left service in 2018, with 1 in 100 leaving in 2010, 6,000 years of officer experience were lost in 2017, with reports that 1 in 3 officers now have less than 3 years' experience in 2018 in comparison to 1 in 8 in 2010 (Ministry of Justice, 2018). Furthermore, 33% of officers who left service in 2018 had less than 12 months experience in comparison to just 7% in 2010. Conversely experienced male staff may also be leaving service due to the adverse effects of other conditions such as burnout and this warrants significant further research attention to explore associations and correlations with the findings of this research. A further important consideration in the finding of violent trauma exposure and PTSD development being moderated by greater years of service in male personnel, is the potential of higher tolerance levels, through habituation and development of resilience overtime as suggested to occur in police officers as a result of 'police culture' and which may similarly occur in prison officers (Papazoglou, 2013). However as previously observed such mechanisms of coping may also be detrimental (Violanti et al., 2013). In light of the findings that staff with less years of service may be non-resilient to violent trauma exposure and staff overall non-resilient to self-harm/death and environmental trauma exposure which are an inherent and non-avoidable aspect of a PO's role, warrants further investigation as to the potential aspects in their development. In the case of the current study resilience to trauma may develop in male staff overtime or may be a consequence of historical 'cultures of coping' inherent in prison staff who have greater occupational experience. Further studies are needed to elucidate these factors, particularly differentiation in regard to the aspects of the typology of trauma involved, and what may harbour greater resilience development in individuals. The findings also suggest directions for organisational implementations. In recent years the US military have researched resilience, developed and implemented resilience building programmes based on the theoretical principles of positive psychology (Seligman & Csikszentmihalyi, 2000) to enhance

soldier's resilience capabilities in response to exposure to combat trauma (Cornum, Matthews & Seligman, 2011). Such programmes could potentially also be developed for other 'at risk' occupations such as police and prison officers to develop resilience to trauma amongst personnel, thus adopting a proactive and preventative strategy as opposed to a reactive treatment-based approach to trauma exposure.

5.4.1 Limitations of current research and further directions

The primary limitation of the current study involves the use of cross – sectional examination of the associations between years of service, trauma exposure, and PTSD symptomology and the inability to infer causation behind the relationships. As such it may be the case that the moderating variable of years of service amongst prison personnel is mediated or postulated by other psychological factors such as resilience and hardiness, therefore established measures that record these variables should be used in conjunction also, alongside controlling for these factors during analytical procedures to elucidate these considerations further.

A potential limitation highlighted in the previous studies in this thesis is the exclusive use of self-report measures. Furthermore, future research efforts should address concerns raised through the use of self-report measures, with the use of clinician-ratings of PTSD to ascertain diagnostic levels of PTSD in participants. Secondly in future studies the use of the PPTM scale although context specific to prison settings, should be utilised in conjunction with a valid and reliable measure of lifetime trauma exposure, such as the Impact of Event Scale – Revised (IES-R; Weiss & Marmar, 1997) which could also be used to evaluate the predictive validity of a weaker or stronger traumatic stress reaction among prison personnel. Thirdly as highlighted the current study was based on data from prison personnel in England and Wales only and, as such, the findings may not be generalizable to other countries. Future studies should seek to validate the PPTM using more systematic sampling (rather than opportunistic) among prison personnel samples drawn from different international organisational backgrounds.

5.4.2 Conclusions

The findings of the current study highlight associations between typology of trauma exposure and PTSD amongst prison personnel and that the association is moderated by years of service. Trauma exposure was positively associated with increased PTSD symptomology among male personnel with less years of service and female personnel with ranging years of

service. However, trauma exposure was negatively associated with PTSD symptomology in male personnel with greater years of service. The findings elucidate the relationships between PTSD symptomology, experience (resilience and hardiness) and trauma exposure, specifically that trauma exposure and PTSD associations are explained through occupational experience by years of service.

CHAPTER SIX:
Conclusion

6.1 OVERVIEW OF AIMS AND FINDINGS

The first chapter of the thesis outlined the historical context of trauma exposure and PTSD; the context and definition of psychological trauma; operational definitions for traumatic stress disorders and depression and anxiety were then outlined followed by PTSD developmental theories; existing trauma exposure measures were reviewed and outlined that have been developed over the past 25 years; previous research pertaining to risk associated occupations was then reviewed specifically, military personnel, firefighters, paramedics, first responders, police officers and prison officers.

The current thesis utilised a robust and advanced methodology. The second chapter therefore, outlined and discussed the methodology employed in the thesis in detail. The cross-sectional nature of the research involving a survey-based design was discussed; a description of the population of prison personnel within England & Wales; the sampling method and participants for the current research; the measures used in the current study; the study procedure; the analytical procedures used within each of the empirical chapters were then outlined and examined. Finally, software programmes utilised within the study (SPSS, Mplus, ModGraph, Qualtrics) were discussed.

Owing to the research findings detailed in the literature reviewed that show working in a prison environment can induce both stress and trauma with deleterious effects on psychological health (Denhof & Spinaris, 2013; Denhof, Morton & Spinaris, 2014; Konda et al., 2013; Spinaris et al., 2012; Stadnyk, 2003) and suggestions of a need for context specific measures of trauma exposure and PTSD in specified populations (Stover & Berkowitz, 2005, O'Hare et al., 2013). The primary aim of the thesis, was to create, develop and validate in a sample of prison personnel a brief self-report measure of trauma exposure specific to personnel employed within a prison environment and to psychometrically test the measure to ascertain the most suitable factorial solution which would identify varying typology groupings of trauma association. A further aim was to test the measure for predicative validity in several adverse psychological conditions, namely PTSD, depression, and anxiety and in varying categories of prison establishments and male and female prison personnel. Further aims were to employ the validated measure to identify meaningful subtypes of anxiety, depression and PTSD symptomology amongst the prison personnel sample and to estimate the associations between anxiety, depression and PTSD class membership and typology of prison trauma exposure.

Lastly the validated measure would also be employed to investigate the ability of the samples years of service working within a prison environment to moderate the relationship between typologies of prison trauma exposure and PTSD symptomology.

Chapter three (the first empirical chapter) aimed to test and validate the dimensionality, factor structure and construct validity of the Prison Personnel Trauma Measure (PPTM). Data was collected from 1995 prison personnel in England and Wales, with 1562 participants being entered into the final analysis, confirmatory factor analysis was used in order to ascertain the model that provided the best fit to the data. The study tested two possible solutions, a traditional unidimensional (one-factor) model of trauma, comprised of each of the fifteen items within the scale and a unidimensional (three-factor) model. It was found that the three-factor model of the PPTM offered the best representation of the data and consisted of three meaningful factors of trauma (exposure to self-harm/death, violent, and environmental trauma). The three factorial solution displayed statistically significant factor loadings across all items with good composite reliability across the three factors. Because the best model fit was multi-dimensional and some of the factors were highly correlated a differential predictive validity test was conducted to verify whether the three factors correlated differentially with the external variables of PTSD, Anxiety, and Depression. Multiple Regression Analysis was used to further test for predictive validity, all three PPTM factors evidenced good differential predictive validity with the outcome variables. Self-Harm/Death trauma exposure was significantly correlated, in males, with PTSD, Anxiety, and Depression but not in females. Violent trauma exposure was significantly correlated, in males, but only with PTSD whereas for females Violence was significantly correlated with all the outcome variables (PTSD, Anxiety and Depression). Environmental trauma exposure was significantly correlated with all outcome variables in males whereas, in females it was only correlated with PTSD and Anxiety. In terms of differences between prison personnel by category of prison (Categories A, B, and C denoting security classification of prison, with A being the highest or maximum security). Self-Harm/Death trauma exposure was significantly correlated with PTSD and Depression in category C prison officers. Violent trauma exposure was significantly correlated with PTSD in all categories, whereas with Anxiety only in category C. The Environmental factor was significantly correlated with Anxiety and Depression for personnel from category A and B prisons. The findings highlighting the differential predictive validity to outcome variables demonstrated that the PPTM should be used as three-subscale measure rather than a unidimensional measure that simply encompasses one factor of trauma as opposed to three.

Studies have shown that PTSD rarely occurs in isolation within individuals that have been exposed to trauma (Kozari´c-Kovaci´c et al., 2001; Orsillo et al., 2002) and patterns of comorbid PTSD symptomology have been demonstrated (Brady et al., 2000; Ginzburg et al., 2010; Galatzer-Levy et al., 2013). Furthermore, higher levels of comorbidity have been found to be more prevalent amongst occupations whose roles entail a higher risk of trauma exposure, (Perrin et al., 2007; Corneil et al., 1999; Fulton et al., 2015).

Chapter four (the second empirical chapter) aimed to identify meaningful subtypes of trauma exposed prison personnel with PTSD, anxiety, and depression symptomology within male and female personnel, with a further aim being to identify associations between the typology of the three trauma factors measured by the PPTM and classes of symptomology within male and female personnel. Results of a latent profile analysis revealed seven distinct classes in male personnel: a 'low symptom group' (14.2%) a 'moderate Anxiety / Depression group' (7.6%) a 'moderate with low PTSD-B group' (26.2%) a 'moderate with increased PTSD-C and low PTSD-B group'. group' (18.5%) a 'moderate symptom group' (6.4%) a 'heightened symptom (16.8%) and a 'high symptom group' (10.3%) and five distinct classes in female personnel: a 'low symptom group' (15.4%) a 'moderate Anxiety / Depression group' (9.7%) a 'moderate with low PTSD group' (28.4%) a 'above moderate symptom group' (28.4%) and a 'high symptom group' (18.1%). Multinomial logistic regression also showed that Male Prison Personnel in the 'moderate with increased PTSD-C and low PTSD-B group' and the 'heightened symptom group' were more likely to be Environmental Trauma Exposed, whereas Male Prison Personnel in the 'high symptom group' were more likely to be Environmental, Self-Harm/Death Trauma Exposed and have significantly less years of service. Female Prison Personnel in the 'moderate symptom group' were more likely to be Environmental and Violent Trauma Exposed, whereas Female Prison Personnel in the 'high symptom group' were more likely to be Violent Trauma Exposed.

Several studies have explored the potential for varying factors to moderate the development of PTSD following trauma exposure (Britt et al., 2013, 2017; Anestis et al., 2017; Fincham et al., 2009; Cluver et al., 2009). Within prison personnel associations between burnout (Maslach, 1982) and levels of occupational experience have been found (Harizanova & Tarnovskao, 2013; Morgan et al., 2002) indicating that inexperienced personnel are susceptible to higher levels of the components of burnout (emotional exhaustion, depersonalisation and lack of personal accomplishment). Within the broader PTSD literature

there is an absence of research exploring the factor of occupational experience to act as a potential moderator for the development of PTSD symptomology.

Chapter five (the final empirical chapter) aimed to investigate the moderating role of prison personnel's occupational experience, measured by years of service working within a prison environment, on the relationship between the three PPTM trauma factors (self-harm/death, violent, environmental) and PTSD symptomology. Results of a moderated regression analysis revealed differential associations between years of service, trauma and PTSD.

Three models were tested whilst controlling for specific variables, interaction terms were entered into the second and third models between the three PPTM trauma exposure factors and years of service. The models were then tested on male and female participants respectively. The findings showed that PTSD symptomology was moderated by years of service but only in regard to violent trauma exposure in male prison personnel as opposed to female personnel, furthermore no significant association between years of service and PTSD symptoms were found for the other two trauma factors (self-harm/death, environmental) in male or female personnel. However, a greater number of years of service in male prison personnel moderated the effects of PTSD development when they had been exposed to trauma involving the witnessing or perpetration of violence whereas male personnel with less years of service and female personnel in general exposed to the three trauma factors were unable to replicate this moderation.

6.2 LIMITATIONS AND STRENGTHS

Notwithstanding the strengths associated with the findings of the thesis, there were some limitations which need to be acknowledged.

The exclusive use of self-report measures and rating scales was arguably a primary limitation. The measures used were based on participants self-reports and therefore the effects measured (PTSD, depression, anxiety, and trauma exposure magnitude) may be partly due to the consequences of response bias. Moreover, when asked about symptomology some participants may choose to exaggerate answers. However, this is a recognised potential consequence of self-report methodology and cannot be controlled by the researcher albeit obtaining as larger sample size as possible to counter bias. Furthermore, self-report measures are widely used and relied upon not just in research but in reporting symptoms to allow clinical diagnoses by practitioners, they also allowed the practical means to 'test' a substantial cohort of prison personnel thus crucially ensuring the generalisability and reliability of the findings.

The study utilised a cross-sectional design and therefore existing as opposed to more generalised validity could only be established. It is also important to note that the analyses were based on data collected from prison personnel in England and Wales only. That said the findings of the present study align with research from disparate countries (Spinaris et al., 2012; Bogaerts & Van der Laan et al., 2012; Konda et al., 2013; Liu et al., 2013; Denhof & Spinaris, 2013; Denhof et al., 2014, Boudoukha et al., 2013; Badru et al., 2018) negating differences in environmental factors regarding trauma exposure and PTSD development.

A similar limitation involves the use of convenience opportunistic sampling and the way the intended participants were informed of the studies intentions which also had the potential to introduce self-response bias which may in turn have affected the findings. However, the nature of the intended sample and limitations surrounding the access to sample this population meant complete integrity as to the nature of the research was of the upmost importance. Likewise, the professional nature in which the research was conducted and subsequently monitored by the POA alongside the large representative sample of participants again will have help negate this potential limitation factor.

The current study utilised the PCL-C (Weathers et al., 1994) which maps directly onto DSM-IV (APA, 2000) diagnostic criteria for PTSD and therefore does not correspond to the most up to date diagnostic criteria for PTSD defined by the DSM-5 (APA, 2013) such as the

PCL-5 (Weathers et al., 2013) which incorporates the addition of NACM (negative alterations of cognition and mood) symptoms as well as the, intrusion, avoidance, and hyper-arousal symptomology. That said the PCL-C does incorporate several items that designate NACM symptomology before the new symptom sub categorisation was incorporated. As such a limitation of the current study was its inability to explore the potential measurement of Complex PTSD amongst the current sample however, as previously stated there is at the time of this thesis no universally agreed consensus amongst scholars or practitioners to a working clinical definition and form of measurement and although included in the ICD 11 (WHO, 2018) there is currently no inclusion within the DSM (APA, 2013). Similarly, it is viable within the current sample that a proportion that were proposed to be PTSD positive may in fact have presented with ASD (DSM-5; APA, 2013) which is characterised by the same symptomology as PTSD but does not persist past one month duration. As the current study did not incorporate a longitudinal methodology the ability to control and recognise this factor was a limitation, that said however the objectives and purpose of the current study did not use clinical measurement procedures to diagnose individuals but a research centred approach as such the results still indicate a significant proportion of individuals potentially incorporating ASD, PTSD or Subthreshold PTSD and provides the basis for the attention of further studies to explore these dimensions further.

A further limitation of the current study is that it did not utilise a measurement of lifetime trauma exposure such as the Life Events Checklist (LEC-5; Weathers et al., 2013) or the Impact of Event Scale – Revised (IES-R; Weiss & Marmar, 1997) and as such key correlations were therefore not considered between personal trauma exposure and occupational trauma exposure amongst the sample as such key factors may have been negated that mean the findings were unable to be placed in context and alternative explanations ruled out. However, the current study did utilise a significant sample that would have mediated the effects of this somewhat. Future research should seek to cross validate the PPTM with a measure such as those mentioned to evaluate the concurrent validity of a life event traumatic stress reaction amongst prison personnel and evaluate the predictive validity of a weaker or stronger traumatic stress reaction amongst those sampled.

A further key consideration in line with the above was the measuring of working conditions within the current study. Although data was gathered surrounding participants main areas of work and the amount of prisoner contact, they had. The nature of prison work within England and Wales meant that participants were often cross deployed between various areas

over a weekly period as such they were asked to record all areas they worked within. This anomaly meant that at the period of data analysis significant noise was created in the data through variables such as significant missing values and therefore an accurate measurement of working conditions factors could not be obtained. In light of this limitation future research should seek to adopt a more robust, accurate and wider ranging measurement of working conditions variables for correlational analysis such as those adopted by the MQPL and SQL (Measuring the Quality of Prison Life; Staff Quality of Life; Liebling, Hulley & Crewe, 2011) which has the potential to be used congruently alongside the PPTM (see section 6.4 Implications for Practice and Intervention).

Furthermore, as the same data set was used to analyse the data for all three empirical studies, the analyses were limited to the factors included in the original survey. As such, other factors, such as resilience, coping, burnout and stress were not available for analysis, and any conclusions about the associations between years of service, trauma exposure and PTSD should be drawn with caution with these limitations in mind. Future research studies are therefore also required to fully explore occupational experience and trauma exposure on PTSD.

Specifically, highlighting limitations to the empirical chapters, the breakdown of PTSD symptom clusters into criterion B, C and D in the second empirical chapter does again not meet the diagnostic criteria of DSM-5 which incorporates the additional symptom cluster of NACM.

In consideration of the third empirical chapter a limitation centres on the cross-sectional examination of the associations between years of service, trauma exposure, and PTSD symptomology and the inability to address the causation behind the relationship, consequently the moderating variable of years of service amongst prison personnel may be mediated or postulated by other psychological factors such as resilience and hardiness, therefore future studies should utilise established measures that record these variables in conjunction with controlling for these factors during analytical procedures to elucidate these considerations further. Furthermore, future studies should also investigate other potential moderators within ‘at risk’ trauma exposed occupations. That said the key finding in the study that relates to occupational experience moderating PTSD amongst male participants warrants the attention of PTSD researchers further.

Despite the aforementioned limitations, the current study provides a significant contribution to the area of trauma exposure. The significant strengths of the current study lie in the utilisation of a large sample of prison personnel, which are an often inaccessible and

significantly under researched trauma exposed population. Indeed, at the time of data collection a representative sample of 10% of the operational workforce of HMPPS provided data for the study, no other study up to the date of this thesis had previously carried out research on a sample of this scale and magnitude. Furthermore, the robust and advanced statistical methodology carried out in the thesis (e.g., latent profile analysis) had never before been applied to a sample of prison personnel within the UK. In the development of the PPTM, the most recent research findings in the field of psychological symptomology in prison personnel were relied upon. The reliability and dimensionality of the PPTM was carefully tested within the sample of personnel drawn from the prison staffing population of England and Wales, across varying categories of prisons and occupational duties.

Research within the fields of psychology and criminology does not always adopt advanced methodology and analysis which in turn can affect the reliability of the findings. The current study implemented advanced statistical methodology and analytical techniques to enable a more comprehensive analysis of the measured variables within the study. The use of confirmatory factor analysis, latent profile analysis, and moderated regression analysis enabled the primary researcher to ascertain the most accurate findings surrounding trauma exposure, PTSD and other related factors within a prison personnel sample. Such statistical research methodological approaches significantly enhance and contribute to the existing research within the environmental, forensic, and applied health psychology fields.

6.3 CONTRIBUTION OF THIS RESEARCH

This thesis provides a significant contribution to several areas of trauma research, firstly to the area of context specific trauma exposure measurement, secondly to the research literature surrounding potential trauma exposure amongst prison personnel, and lastly to the understanding of PTSD comorbidity symptomology and its development.

The most significant contribution is the development and psychometric validation of the PPTM within a substantive sample of prison personnel. The development of a context specific measure of trauma exposure that can be utilised amongst prison personnel supports the findings of previous research amongst such populations that indicate high levels of trauma exposure and subsequent development of adverse psychological symptoms (Spinaris et al., 2012; Denhof & Spinaris, 2013; Boudoukha et al., 2013; Denhof et al., 2014). In particular the reference to context specific trauma exposures further elucidates this specific research area. Namely, the evidence presented that supports PTSD comorbidity findings amongst prison personnel (Spinaris et al., 2012; Denhof & Spinaris, 2013; Denhof et al., 2014) means the PPTM provides a substantive measure to further elucidate this research area in future studies. Furthermore, the identification of a three-factor solution in the validation of the PPTM which was shown to provide the superior fit to the data indicates sub categories of context specific trauma exposures measured by the PPTM namely exposure to self-harm/death, violent, and environmental trauma exposure and therefore enables the categorisation of specific and very different typologies of exposures to be distinguished. The differential predicative validity of the PPTM also demonstrates the potential for distinctions to be drawn based on gender and security classification of prison establishment. The PPTM can thus be used to ascertain potential vulnerability to the subsequent development of adverse psychological symptoms of PTSD, anxiety, and depression amongst prison personnel following specified trauma related experiences that occur in the prison environment. The PPTM can also be utilised alongside the use of clinical or established self-report measures for PTSD, anxiety and depression in order to identify individuals or sub-sets of personnel who may be at risk for the development of psychological illnesses in association to prison trauma exposure.

The second significant contribution relates to the identification of meaningful subtypes of anxiety, depression and PTSD symptomology amongst prison personnel as well as the identification of class membership based on typology of trauma, gender and years of service.

The division of PTSD symptomology clusters is arguably a significant strength providing elucidation on which symptom clusters are more prevalent in conjunction with trauma typology and patterns of comorbidity with other symptom clusters, as well as comorbidity with anxiety and depression. The second empirical study further elucidates findings in previous research for disparity in PTSD comorbidity that suggest several mechanisms may account for its development and supports evidence for several of these factors, namely that depression and anxiety may increase the risk of developing PTSD; or PTSD may be a casual risk factor to the development of anxiety and depression; or the observed comorbidity may be attributed to symptom overlap, or PTSD, anxiety and depression may share commonalities of risk factors and still remain independent disorders (Breslau, 2002; O'Donnell et al., 2004). Important distinctions were drawn between patterns of PTSD, anxiety, and depression comorbidity in trauma exposed prison personnel as well as important differences in the relationship of trauma exposure typology and comorbidity symptomology. Despite previous research identifying comorbidity of PTSD, anxiety, and depression, amongst prison personnel (Spinaris et al., 2012; Denhof & Spinaris, 2013; Denhof et al., 2014) the study was the first of its kind to profile prison personnel by symptomology and assess associations of typologies of trauma unique to working in a prison environment.

The final significant contribution of this thesis lies in the findings of the final empirical study. Previous research has investigated the ability of various factors to moderate the development of PTSD following significant trauma exposure (Britt et al., 2013, 2017; Anestis et al., 2017; Fincham et al., 2009; Cluver et al., 2009). However, there is an absence within the PTSD literature exploring the factor of occupational experience to act as a potential moderator for the development of PTSD symptomology. Despite associations between burnout (Maslach, 1982) and levels of occupational experience in prison personnel being found (Harizanova & Tarnovskao, 2013; Morgan et al., 2002) which indicate that inexperienced personnel are susceptible to higher levels of the components of burnout, occupational experience has never been considered as a potential moderator to the development of PTSD following trauma exposure. Furthermore, the further investigations in the study to explore differentiations between trauma typologies and gender is a significant contribution which provides key differential considerations in the findings. Namely in considering years of service as a measure of occupational experience it was found that PTSD symptomology in male personnel was moderated by higher years of service following significant exposure to violent trauma and that this moderation was not replicated in female personnel. Furthermore, years of service did

moderate PTSD symptomology in respect to exposure to incidents of self-harm/death and environmental trauma in male or female personnel. The findings suggest that there is some unique, or further factors, or level of habitational development within experienced male staff in respect to exposure to repeated chronic violence that enables them to moderate the effects of PTSD development.

Although theoretical perspectives surrounding the development of PTSD were not tested directly within this thesis, the findings of the current study do highlight potential disparities between the theories as well as a contribution to their current status. As PTSD is associated with disturbances in a wide range of psychological processes so too is the manifestation of varying forms of PTSD symptomology criterion as well as comorbidity with other disorders. The findings of the second empirical chapter in particular within the current sample demonstrate varying symptomology levels and disparity in PTSD criterion clusters; as well as varying levels of comorbidity with anxiety and depression; category of prison establishment; age; years of service; and gender following exposure to differential typologies of trauma (violence, self-harm/death, environmental). The current study focus helps to inform the theories of PTSD development current statuses by providing further indication to variations in the way PTSD symptomology is developed and maintained namely within specific occupational cohorts that are routinely exposed to trauma.

Firstly, evolutionary theories provide a focus for the similarity between trauma exposure in the EEA and the current time period in terms of the similarities inherent with PO's roles and the risk of interpersonal violence. Within the current study the findings throughout the empirical chapters indicated that exposure to interpersonal violence was particularly problematic for females that were sampled as opposed to males. Some evolutionary PTSD theorists have argued that males are predominately more orientated and habituated to violence as a gender (Cantor, 2005; Chemtob et al., 1988) and may develop resilience to its exposure, a finding that was potentially elucidated in the last empirical study and one which warrants further attention.

Emotional Processing Theory (EPT; Foa & Kozak, 1986; Foa et al., 1989) suggests that traumatic events violate the assumptions that people hold regarding concepts of safety, the central concept of the theory is that the fear network assumes a cognitive representation of fear within memory as well as emotional reactions and ongoing beliefs about levels of threat present within the environment. This is extremely plausible in an occupational cohort routinely exposed to trauma as a prerequisite of the role, that is further reliant on the entrusting of their

overall safety on factors maintained by a managerial hierarchy and policy structure, such as the diminishing of significant numbers of operational frontline staff (Ministry of Justice, 2012, 2018) violation of these concepts of safety may lead to development of PTSD as proposed by EPT. The work of PO's also entails a significant amount of hypervigilance (a pre requisite for PTSD as defined by EPT), within the current study the findings of the second empirical study found symptom comorbidity disparity that was indicative of higher levels of anxiety as well as higher values for the PTSD-D symptom cluster characterised by increased arousal both in male and females as opposed to depression alone. However, in contrast the higher symptom value groups displayed comorbidity across all three PTSD symptom clusters as well as anxiety and depression potentially leading to complex developmental issues surrounding PTSD.

Dual Representation Theory (DRT; Brewin et al., 1996, 2010; Brewin, 2008) provides a contrast to EPT proposing the traumatic memory is an ordinary memory with particular structures. DRT postulates the trauma memories are represented in a distinct way, pathological responses attributable to PTSD occur when traumatic memories become dissociated from ordinary memory systems and recovery processes lie in the ability to assimilate the traumatic memories into ordinary memories. Again, considering the role entailments of PO's it is again plausible that many of the sample investigated have continued to work in their roles despite adverse symptomology following significant trauma exposure and that similarly encountered incidents may exacerbate and disrupt the traumatic memory processes further, particularly in the context of repeated chronic exposure that does not produce a significant measurable level of PTSD but manifests at a subthreshold level.

As emotional responses to trauma are also dependent upon cognitive appraisal, factors such as the individual's expectancies and perception of control over the situation have been elaborated by the Cognitive Model of PTSD (CM; Ehlers & Clark, 2000). The CM identifies a wider range of negative appraisals relevant to PTSD. The experiencing of extreme stress and the way an individual appraises potential threat is an essential factor in the occurrence of acute stress reactions. If an ineffective regulation of these acute stress reactions occurs, it may result in an ongoing dysregulation which the CM postulates will result in PTSD symptoms occurring. Similarly, to EPT and DRT variability is plausible in the current sample due to the nature of PO's work, disparity is evident in the findings that suggest that what certain individuals appraise as significantly traumatic is demonstrated in the reaction to varying typologies of trauma, the findings throughout the thesis that demonstrate exposure to violence is more problematic to female personnel and exposure to self-harm and death is more problematic to

male personnel supports this notion. Furthermore, PO's work requires a high perception of control to be maintained by an individual in order to effectively execute their role. PO's however have limited control in 'real terms' and maintain a fine margin between control and disorganisation, dysregulated further still by individual expectations.

As stated previously, to date there is no unified theory regarding the development of PTSD that encapsulates and incorporates the principles and elements of, the CM, DRT and EPT. The disparate findings of the current thesis are therefore further indicative that PTSD development is likely due to the complexity of the mental processing involved, which incorporates a range of factors including memory, attention, cognitive-affective reactions, beliefs, coping strategies, and social support and therefore further research to provide elucidation within specific occupational cohorts is required, particularly in respect to the development of comorbidity with PTSD.

6.4 IMPLICATIONS FOR PRACTICE AND INTERVENTION

At the time of concluding this thesis Her Majesty's Prison and Probation Service (HMPPS) had previously released reports from prisons in England and Wales in 2017 (Ministry of Justice, 2017) that showed that self-inflicted deaths amongst inmates had increased 32% from 2016 and doubled since 2012. Self-harm incidents had increased 23%, prisoner on prisoner assaults increased 28% and serious assaults (classified on severity of injury) by 30%. Crucially assaults on staff had increased 40% with 761 classified as serious and had trebled since 2012. All of these figures were reported to be the highest ever recorded at the time (Ministry of Justice, 2017) in UK prisons. Further subsequent reports released in 2018, showed that these figures had further increased, with self-harm incidents rising by 16%, prisoner on prisoner assaults rising by 16% and serious assaults by 9%. Assaults on staff had further increased by 26% with serious assaults increasing by 11% (Ministry of Justice, 2018). Figures were projected to rise further still by the release of annual reports in 2019. A number of key policy changes and implementations affecting the management and structure of prisons originating from the central UK government had been argued to account for the increasing figures (Prison Officers Association, 2017, 2018).

In view of the release of such official statistics the research carried out within this thesis holds a number of possible implications for practice and intervention.

Firstly, the PPTM has the potential to be used not only as a prison research measure but as an organisational self-report tool to ascertain levels of trauma exposure in prison personnel. A strength of the PPTM is the identification of three sub-sets of trauma exposure (self-harm/death, violent, environmental trauma exposure) as well as the individual items listed within it that allow for the identification of context specific traumas that prison personnel may be exposed to in their duties.

Given the varied predicative validity of the PPTM it may be used to screen personnel individually or collectively to identify individuals who may be at risk of significant trauma exposure (it is important to note that the PPTM needs further validation prior to its implementation in this regard, please see the proceeding section, 6.5 Future directions).

The PPTM may also be used alongside clinical or established self-report measures for PTSD, anxiety and depression in order to identify individuals or subsets of personnel who may

be at risk for the development of psychological illnesses in association to particular typologies of trauma exposure.

A high rate of sickness absence has also been recorded in the prison service of England & Wales, in the twelve-month period to March 2014, 40,000 working days were lost, over a quarter of this absence was due to job-related stress, anxiety and depression (Ministry of Justice, 2014). Failures to address turnover issues and subsequent understaffing can lead to the compromising of safety for staff and prisoners, and the ability to run a safe and humane regime as well as hinder the effective and efficient operation of prisons (Higgins et al., 2013). The early identification and intervention of personnel who may be at risk of developing adverse psychological symptomology, through the use of the PPTM may reduce protracted sick leave requirements and turnover and retention issues. The work of a Prison Officer requires a high degree of self-confidence as well as self-awareness in order for an individual to be operationally effective in dealing for the most part with significant intimidation, PTSD, depression and anxiety are all deleterious psychological conditions that cause significant distress or impairment in social, occupational and other areas of functioning (APA, 2013).

A further utility of the PPTM may be its use alongside existing climate measurement tools surrounding the quality of prison life such as the MQPL and SQL (Measuring the Quality of Prison Life; Staff Quality of Life; Liebling, Hulley & Crewe, 2011). The MQPL survey of prisoners' perceptions is a validated way of gauging the quality of decency and safety within an establishment and which are vital business aims but difficult to define and measure by other means. Similarly, the SQL measures staff perceptions of dimensions such as management, job satisfaction, authority and prisoner orientation and have been used by HMPPS as a method of auditing prison establishments. The use of the PPTM alongside the SQL and officially collated statistics may help to present a clearer picture of the current behavioural presentation of a prison establishments environment, such as allowing the cross comparison of results to help inform at a local and national level. The PPTM could be utilised (with slight re wording) to measure a specific time frame of current serving staff within a prison as opposed to lifetime traumatic exposure. The strength of the PPTM for this purpose compliments and allies itself to existing measurement procedures through its predictive validity for adverse psychological symptomology which is hard to ascertain using official statistics alone. Likewise, the SQL does not incorporate a measurement of potentially harmful exposures to prison work that the PPTM is able to record. Similarly, the SQL could complement the PPTM measurement by providing

a robust and clearer measurement of working conditions factors that would help to inform results obtained through the PPTM.

The findings of potentially high levels of adverse psychological symptomology within prison personnel in this research warrants serious concern. PTSD has long been recognised as a severe problematic area in military personnel post conflict, but its levels of prevalence and effects throughout prison personnel in the UK remain largely unknown and unaddressed as well as its association of comorbidity with other conditions, caution must be stressed however as this research used an opportunistic convenience sampling approach and did not use clinical measurement procedures to diagnose individuals, that said the current research did utilise a significant sample size of prison personnel from the prison service of England and Wales.

A key strength of this research lies in the ability of the PPTM to identify subsets of personnel that are at higher risk to certain typologies of prison trauma. For instance, it was found throughout the three empirical chapters in this thesis that female personnel were more susceptible to adverse psychological conditions following violent trauma exposure, the validation of the PPTM showed that violence was significantly correlated in female personnel with all the outcome variables (PTSD, Anxiety and Depression). Similarly, in the second empirical study, multinomial logistic regression showed female personnel in the 'moderate symptom group' were more likely to be environmental and violent trauma exposed, whereas female prison personnel in the 'high symptom group' were more likely to be violent trauma exposed. Lastly, the moderated regression analysis employed in the final empirical chapter showed that years of service did not moderate PTSD symptoms following violent trauma exposure in female personnel whereas for male personnel with higher years of service the reverse effect was apparent. In consideration of male personnel, the PPTM factor of self-harm/death trauma exposure was more problematic. The validation of the PPTM showed that self-harm/death trauma exposure was significantly correlated, in males, with PTSD, anxiety, and depression but not in females. Similarly, in the second empirical study, multinomial logistic regression showed male personnel in the 'high symptom group' were more likely to be environmental, self-harm/death trauma exposed and have significantly less years of service. The results displayed mixed findings between male and female personnel regarding environmental trauma exposure indicating this factor is particularly problematic for both genders. The PPTM also displays differential predictive validity for prison security category and can therefore indicate which trauma factors may be problematic in certain establishments. These findings suggest directions for organisational implementations, in recent years the US

military have researched resilience, developed and implemented resilience building programmes based on the theoretical principles of positive psychology (Seligman & Csikszentmihalyi, 2000) to enhance soldier's resilience capabilities in response to exposure to combat trauma (Cornum et al., 2011). Such programmes could potentially also be developed for prison personnel to develop resilience to trauma amongst personnel, thus adopting a proactive and preventative strategy as opposed to a reactive treatment-based approach to trauma exposure (again it is important to note that further research is required to investigate the ability of resilience to moderate PTSD symptomology following trauma exposure in respect to prison personnel, please see the proceeding section, 6.5 Future directions).

The findings of this thesis also provide support that less occupational experience (measured in this thesis by years of prison service) maybe not only detrimental to the routine role effectiveness of prison personnel in establishments but also to individual personnel's psychological health. This is an important overall consideration for the organisational structures of prison systems, where wide scale hiring of younger prison officers to replace experienced prison officers (Jauvin et al., 2003) initiated by the central UK government to provide a more cost effective public service have led to higher absenteeism rates, turnover, lower staff retention, and stress amongst the workplace, alongside increases in violence, self-harm and suicide rates (Ministry of Justice, 2018) as a result of the rapid and erroneous implementations of new policies. Further to this the prison service of England & Wales, reported a loss of 596 PO's in 2016 and 1244 in 2018 a difference of 109%, 1 in 16 Officers left service in 2018, with 1 in 100 leaving in 2010, 6,000 years of Officer experience were lost in 2017, with reports that 1 in 3 Officers having less than 3 years' experience in 2018 in comparison to 1 in 8 in 2010. Furthermore, 33% of officers who left service in 2018 had less than 12 months experience in comparison to just 7% in 2010 (Ministry of Justice, 2018).

6.5 FUTURE DIRECTIONS

Whilst this thesis provides a significant contribution to criminal psychology research, the following section serves to highlight possible directions for future research.

With regards to the PPTM, as the PPTM has only been validated within this thesis it is therefore suggested that further validation is required. It is important to note that the analyses in this thesis were based on data from prison personnel in England and Wales only and, as such, the findings may not be generalizable to other countries. Future studies should validate the PPTM using a systematic sampling approach (rather than opportunistic) among prison personnel samples drawn from different international organisational backgrounds as well as varying levels of prison security to establish greater validity. Studies may also utilise a larger representative sample to provide cross comparison with lower security prisons which were not validated within this thesis. Whilst the majority of the items of the PPTM meet the threshold of 0.40 and above as suggested desirable by Comery and Lee's (1992) for standardized factor loadings Q9 was slightly below this at 0.37. Further validation would therefore potentially increase internal reliability of the scale and provide support to the theoretical construct of the PPTM and its three factor (self-harm/death, violent, environmental trauma exposure) solution. Future research should also seek to cross validate the PPTM with a measure such as the Life Events Checklist (LEC-5; Weathers et al., 2013) to evaluate the concurrent validity of a life event traumatic stress reaction amongst prison personnel or a valid and reliable measure of lifetime trauma exposure, such as the Impact of Event Scale – Revised (IES-R; Weiss & Marmar, 1997) could also be used to evaluate the predictive validity of a weaker or stronger traumatic stress reaction among prison personnel. The PPTM may also be validated with further predictive validity outcome variables of adverse symptomology such as burnout (Maslach, 1982) which has been found to be particularly detrimental amongst prison personnel (Harizanova & Tarnovska, 2013).

Regarding the latent profile analysis undertaken in the second empirical chapter, future studies should adopt a longitudinal approach to ascertain whether the measured variables can elucidate the development PTSD comorbidity following trauma exposure as opposed to simply documenting its presence. Further analysis of prison category from lower to higher security facilities could be utilised as well.

In consideration of the third empirical chapter a limitation centres on the cross-sectional examination of the associations between years of service, trauma exposure, and PTSD symptomology and the inability to address the causation behind the relationship, consequently the moderating variable of years of service amongst prison personnel may be mediated or postulated by other psychological factors such as resilience and hardiness, therefore future studies should utilise established measures that record these variables in conjunction with controlling for these factors during analytical procedures to elucidate these considerations further. Furthermore, future studies should also investigate other potential moderators within 'at risk' trauma exposed occupations such as coping and distress tolerance as well as measurements of perceived stress and burnout as outcome variables. The key finding in the study that relates to occupational experience moderating PTSD amongst male participants warrants the attention of PTSD researchers further.

Future research efforts should address concerns raised through the use of self-report measures, with the use of clinician-ratings of PTSD to ascertain diagnostic levels of PTSD in participants. The current study utilised the PCL-C (Weathers et al., 1994) which maps directly onto DSM-IV (APA, 2000) diagnostic criteria for PTSD and therefore does not correspond to the most up to date diagnostic criteria for PTSD defined by the DSM-5 (APA, 2013). Future studies should utilise the PCL-5 (Weathers et al., 2013) which maps directly onto DSM-5 diagnostic criteria and incorporates the addition of NACM (negative alterations of cognition and mood) symptoms as well as the, intrusion, avoidance, and hyper-arousal symptomology. The PCL-5 could therefore be used to elucidate further investigation into complex PTSD diagnoses as defined in the ICD-11 (WHO, 2018) as it allows the sub categorisation classification of the disorder. Complex PTSD has been shown to be particularly problematic for cohorts of chronically trauma exposed individuals (Shevlin et al., 2017) and may also warrant the attention of research into chronically trauma exposed occupations.

It is also proposed that similar comprehensive context specific trauma exposure measures to the PPTM are developed for 'at risk' occupations such as those discussed within this thesis, police officers, firefighters, paramedics and first responders, and military personnel. Furthermore, in consideration of official statistics (Ministry of Justice, 2017; 2018) that show a significant escalation in the levels of potentially traumatic incidents that prison personnel are exposed to in the course of their duties it therefore stands to reason that prisoners themselves are subjected to the same or similar patterns of trauma exposure whilst incarcerated. Higher rates of PTSD have been found amongst prisoners as a consequence of higher exposure to

traumatic events during childhood and / or adulthood than individuals in the general population (Jordan, Schlenger, Fairbank, & Caddell, 1996; Urbaniok, Endrass, Noll, Vetter, & Rossegger, 2007; Weeks & Widom, 1998). Notably however there is no significant differentiation between typologies of traumatic life events between prison and civilian populations (Collins & Bailey, 1990; Gibson et al., 1999). The development of a similar scale to the PPTM for use amongst offender populations is therefore suggested to elucidate disparity between trauma exposure, PTSD and further subjection to trauma exposure and development of adverse symptomology whilst imprisoned.

Despite the recommendations for future research, this thesis has proven a success in its primary objectives in the creation, development and psychometric validation of the PPTM, as well as advancing the current understanding of trauma exposure, PTSD and comorbidity symptomology within prison personnel a previously relatively unconsidered and under researched population. This thesis provides enhanced opportunities for increasing the understanding of the processes that underlie trauma exposure, PTSD and adverse symptomology within occupations whose work entails a high level of potential exposure to traumatic incidents and thereby fosters new directions for future criminal psychology research to investigate.

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Appendices

Information Sheet

Project title: Correlates of chronic stress and mental health illness in UK Prison Staff

Project institution: Department of Behavioural and Social Sciences, University of Huddersfield. **project researchers**: Russell Woodfield (Russell.Woodfield@hud.ac.uk) Supervisor; Dr Daniel Boduszek (D.Boduszek@hud.ac.uk)

Evidence suggests UK based Prison Staff have high amounts of work-related chronic stress and it is contributing to a variety of mental health related illnesses. Yet little is known about contributory factors. The purpose of this research, therefore, is to further the understanding of the factors that increase the risk of stress and mental health illness, in order to inform the development of more effective and tailored prevention and treatment strategies.

To participate, you do not need to have experienced stress related or mental health illness. In fact, we need individuals who have not so that we are able to create a comparison group.

If you choose to participate in this research, you will be asked to complete measures which ask about your recent thoughts, feelings, and mental health symptoms and some of the questions concern issues of a personal nature.

The total time commitment for the research will be approximately 15-20 minutes. You are able to stop your participation at any time by closing the web browser.

It is possible that you may experience a degree of emotional distress while answering items contained in this research. If you become upset or distressed, please talk to someone you trust or contact the Samaritans on 08457 90 90 90 or jo@samaritans.org to talk things through. The Samaritans provide confidential non-judgmental emotional support 24 hours a day. NOMS staff can self-refer for confidential counselling, up to a maximum of six sessions in any 12-month period – the telephone helpline is open for you to do this 24 hours a day, 365 days a year. No management referral or form is necessary so you can access counselling in confidence if required, please contact 0800 019 8988. Please also see employee assistance services under my services accessible on staff intranet homepage. The POA confidential stress & support counselling phone line, if you're affected by stress and would like to get help and support, call 0800 107 6585. Lines are open 24 hours a day, seven days a week.

Please answer all questions as objectively as possible. All responses provided will be kept confidential. We will not ask you to provide any identifying information such as your name. No individual responses will be reported, only group findings.

In completing and submitting my responses to this survey, I understand that:

- My participation is voluntary.
- I can withdraw during the online completion but once the answers are submitted, it will no longer be possible to withdraw due to the anonymous data collection procedure.

- All responses will be anonymous.
- The data will be used for research purposes and will be published but that my identity will be anonymous.
- The data will be archived for a period of up to 5 years.
- This research is being conducted in accordance with the British Psychological Society's Code of Ethics and Conduct (2009).
- I may contact Russell Woodfield Russell.Woodfield@hud.ac.uk for answers to questions about this research or my rights.

If you have any concerns about this study and wish to contact someone in confidence, you may contact: **Dr Derrol Kola-Palmer, Head of Psychology and Counselling, University of Huddersfield d.kola-palmer@hud.ac.uk or 01484 472809.**

Debrief Sheet

Thank you very much for your participation.

The overall aim of the project is to examine the factors associated with chronic stress and mental health illness among Prison Officers.

As previously stated, the data you have provided will remain completely confidential. No identifying information (e.g., your name) has been collected and, therefore, your data remains completely anonymous.

Should you require further support or advice the following sources may be of interest:

Samaritans
Samaritans are available to talk 24 hours a day, 365 days a year
Samaritans can be contacted on 08457 90 90 90
They can also be contacted via e-mail at jo@samaritans.org

NOMS employee assistance services (counselling referral).

0800 019 8988

POA confidential stress & support counselling phone line
call 0800 107 6585.
Lines are open 24 hours a day, seven days a week.

If you would like to receive a summary of the results of this research or if you have any further questions or queries, please do not hesitate to email Russell Woodfield on: Russell.Woodfield@hud.ac.uk

Questionnaires

Demographic and Work History Report Form

Gender

Male_____

Female_____

Age_____

Marital status

Married

Single

Living with partner

Divorced

Separated

Widowed

(Experience) Time with Prison Service _____ years

Current establishment

Public / Private sector (Please circle)

Women's

Men's

Male Young Offenders

Mixed Adult / Young Offenders

CATEGORY A_____

CATEGORY B_____

CATEGORY C_____

CATEGORY D_____

Current grade

Operational Support Grade_____

Prison Officer_____

Supervising Officer_____

Custodial Manager_____

Governor Grade_____

Please indicate your main work area (tick all that apply)

Wings / Landings	
Segregation	
OMU	
Reception	
Visits	
Operations / Security	
Residential SO / CM	
Any office-based role	
Other	

General amount of Prisoner Contact (tick one)

All of working day_____

Majority of working day_____

Moderate amount of working day_____

Small amount of working day_____

None of working day_____

Have you ever been diagnosed with a mental health related illness that could be attributable to your work?

Yes_____

No_____

If so how many days have you been absent from work in the last 3 years because of such an illness?

6 months +_____

3-6 months_____

1-3 months_____

1 month or less_____

1 week or less_____

Are or have you ever received medical treatment for a mental health related illness that could be attributable to your work?

Yes_____

No_____

In your current role have you ever_____? (Please tick boxes most applicable)

	Never	1-10 times	11-20 times	21+ times
witnessed self – harm behaviour by a prisoner				
witnessed suicide attempts by a prisoner				
been threatened physically by a prisoner				
been physically assaulted by a prisoner				
been verbally abused by a prisoner				
been subjected to passive aggression i.e. intimidation by a prisoner				
worked completely isolated from other staff with prisoners				

witnessed prisoner on prisoner violence				
witnessed prisoner on staff violence				
witnessed staff on prisoner violence				
witnessed death of a prisoner or colleague				
worked on a poorly designed wing i.e. narrow corridor's, blind spots etc.				
worked in dirty protest conditions				
been subjected to an assault with excrement by a prisoner				
been involved in a cell fire extraction (removed a prisoner from a burning cell)				

Do you smoke?

Yes_____

No_____

Do you drink alcohol? (NHS recommendations state no more than 14 units for men and women a week, ideally spread over 7 days, 14 units = 6 pints of beer or 10 small glasses of wine).

No

Yes, less than 5 units per week

Yes, 5-14 units per week

Yes, 14-21 units per week

Yes, 21+ units per week

HOSPITAL ANXIETY AND DEPRESSION SCALE (HADS; Zigmond & Snaith, 1983)

Select the box beside the reply that is closest to how you have been feeling in the past week. Don't take too long over your replies: your immediate response is best.

1.	**I feel tense or 'wound up'**	
	Most of the time	
	A lot of the time	
	From time to time, occasionally	
	Not at all	
2.	**I still enjoy the things I used to enjoy:**	
	Definitely as much	
	Not quite so much	
	Only a little	
	Hardly at all	
3.	**I get a sort of frightened feeling as if something awful is about to happen:**	
	Very definitely and quite badly	
	Yes, but not too badly	
	A little, but it doesn't worry me	
	Not at all	
4.	**I can laugh and see the funny side of things:**	
	As much as I always could	
	Not quite so much now	
	Definitely not so much now	
	Not at all	
5.	**Worrying thoughts go through my mind:**	
	A great deal of the time	

8.	**I feel as if I am slowed down:**	
	Nearly all the time	
	Very often	
	Sometimes	
	Not at all	
9.	**I get a sort of frightened feeling like 'butterflies' in the stomach:**	
	Not at all	
	Occasionally	
	Quite Often	
	Very Often	
10.	**I have lost interest in my appearance:**	
	Definitely	
	I don't take as much care as I should	
	I may not take quite as much care	
	I take just as much care as ever	
11.	**I feel restless as I have to be on the move:**	
	Very much indeed	
	Quite a lot	
	Not very much	
	Not at all	
12.	**I look forward with enjoyment to things:**	
	As much as I ever did	

	A lot of the time	
	From time to time, but not too often	
	Only occasionally	
6.	**I feel cheerful:**	
	Not at all	
	Not often	
	Sometimes	
	Most of the time	
7.	**I can sit at ease and feel relaxed:**	
	Definitely	
	Usually	
	Not Often	
	Not at all	

	Rather less than I used to	
	Definitely less than I used to	
	Hardly at all	
13.	**I get sudden feelings of panic:**	
	Very often indeed	
	Quite often	
	Not very often	
	Not at all	
14.	**I can enjoy a good book or radio or TV programme:**	
	Often	
	Sometimes	
	Not often	
	Very seldom	

THE POSTTRAUMATIC STRESS DISORDER CHECKLIST – CIVILIAN VERSION (PCL-C; Weathers, Litz, Herman, Huska, & Keane, 1994)

The following are symptoms that people sometimes have after experiencing traumatic or terrifying events in their lives. Please read each one carefully and decide how much each of the symptoms have bothered you in the last month please circle a number.

		Not at all	A little bit	Moderately	Quite a bit	Extremely
1.	Repeated, disturbing memories, thoughts, or images of a stressful experience from the past?	1	2	3	4	5
2.	Repeated, disturbing dreams of a stressful experience from the past?	1	2	3	4	5
3.	Suddenly acting or feeling as if a stressful experience were happening again (as if you were reliving it)?	1	2	3	4	5
4.	Feeling very upset when something reminded you of a stressful experience from the past?	1	2	3	4	5
5.	Having physical reactions (e.g., heart pounding, trouble breathing, or sweating) when something reminded you of a stressful experience from the past?	1	2	3	4	5
6.	Avoid thinking about or talking about a stressful experience from the past or avoid having feelings related to it?	1	2	3	4	5

7.	Avoid activities or situations because they remind you of a stressful experience from the past?	1	2	3	4	5
8.	Trouble remembering important parts of a stressful experience from the past?	1	2	3	4	5
9.	Loss of interest in things that you used to enjoy?	1	2	3	4	5
10.	Feeling distant or cut off from other people?	1	2	3	4	5
11.	Feeling emotionally numb or being unable to have loving feelings for those close to you?	1	2	3	4	5
12.	Feeling as if your future will somehow be cut short?	1	2	3	4	5
13.	Trouble falling or staying asleep?	1	2	3	4	5
14.	Feeling irritable or having angry outbursts?	1	2	3	4	5
15.	Having difficulty concentrating?	1	2	3	4	5
16.	Being “super alert” or watchful on guard?	1	2	3	4	5
17.	Feeling jumpy or easily startled?	1	2	3	4	5

Prison Officers Association – Research Approval

The Professional Trades Union for Prison,
Correctional & Secure Psychiatric Workers

National Chair: Mike Rolfe
General Secretary: Steve Gillan

Headquarters:
Cronin House
245 Church St.
Edmonton
London N9 9HW

t. 020 8803 0255
f. 020 8803 1761
e. general@poauk.org.uk
w. www.poauk.org.uk

North Regional Office
1 Linden House
Sardinia St.
Leeds
LS10 1BH

t. 01132 428833
f. 01132 429075
e. adminnro@poauk.org.uk

Northern Ireland
Castell House
116 Ballywalter Rd.
Millisle Co Down
BT22 2HS

t. 02891 861928
f. 02891 861839
e.adminni@poauk.org.uk

Scotland
21 Calder Rd.
Edinburgh
Scotland
EH11 3 PF

t. 0131 443 8105
f. 0131 444 0657
e. adminscot@poauk.org.uk

POA Circular 93/2016

Action		Information	
England/Wales		England/Wales	X
Scotland		Scotland	X
Northern Ireland		Northern Ireland	X
Special Hospitals		Special Hospitals	X
Private Sector		Private Sector	X
IRC		IRC	X

4th June 2016

Dear Russell,

Further to your application to the POA to conduct research on the membership in support of your PhD. Please accept this letter as confirmation that the National Executive Committee of the Prison Officers Association are willing to permit and fully support you in conducting this piece of work. I wish you every success in this undertaking and look forward to seeing the finished result which i believe will be of major benefit in improving the publics understanding of the difficult role Prison Officers undertake on behalf of society.

Yours sincerely

Steve Gillan
General Secretary

Prison Officers Association – Research Dissemination Circular

POA Circulars

93 | 19.10.2016

ASSISTANCE REQUIRED ASSISTANCE REQUIRED

Russ Woodfield is a serving Prison Officer and POA member currently undertaking PhD Research with the University of Huddersfield, into the Mental Health of Prison Staff.

In support of this research and supported by the NEC, Russ has submitted the following request:

I am kindly asking for participants to complete an online survey, the survey is completely anonymous and no personal information regarding your identity will be recorded. This is completely independent research of my own undertaking and has in no way been commissioned by NOMS.

The survey is designed to investigate your current mental health and work related stress levels.

I am intending to use the findings to highlight the plight of Prison Officers under current working conditions through independent publications and also to help raise public awareness, ultimately to provide a further means to effect change in our working conditions and practices.

If you would like to assist me in this simply click on the qualtrics link below and follow the instructions,

The survey is open to all Prison Staff and Staff who work in Secure Psychiatric Facilities (all grades / roles etc.) and who currently work or have worked with prisoners in the past.

My contact details are contained within the survey link if you have any questions or concerns regarding the research please don't hesitate to email me directly and I will gladly answer any questions you may have.

Many thanks in advance for your help.

https://huddersfieldbss.eu.qualtrics.com/SE/?SID=SV_77FvvYL2uDs5ckR

Please draw the contents of this circular to your members and ask them to assist in this research which will have long term benefits to POA members as we seek to improve the publics' understanding of the difficult and demanding role you undertake on behalf of society.

Yours sincerely

ANDY DARKEN
Deputy General Secretary