

**Nature and Extent of Posttraumatic  
Stress Disorder (PTSD) Symptoms  
Presenting in an Adult Psychological  
Therapies Service**

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Doctorate in Clinical Psychology

University of Edinburgh

2011

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Word Count: 30,961 (excluding table of contents, lists of figures/tables, references and appendices)

## Declaration of Own Work

I confirm that all this work is my own except where indicated, and that I have:

- Composed and undertaken the work myself
- Clearly referenced/listed all sources as appropriate
- Referenced and put in inverted commas any quoted text of more than three words (from books, web, etc)
- Given the sources of all pictures, data etc. that are not my own
- Not made undue use of essay(s) of any other student(s) either past or present (or where used, this has been referenced appropriately)
- Not sought or used the help of any external professional agencies for the work (or where used, this has been referenced appropriately)
- Not submitted the work for any other degree or professional qualification except as specified
- Acknowledged in appropriate places any help that I have received from others (e.g. fellow students, technicians, statisticians, external sources)
- I understand that any false claim for this work will be penalised in accordance with the University regulations

**Signature** .....

**Date** .....

## **Acknowledgements**

Firstly, I am most grateful to the participants who took part in my study as well as the clinicians who either identified participants or administered my questionnaires.

I would like to thank my thesis supervisors, Prof Kevin Power who offered much support and whose vast research experience filled me with confidence that my mistakes would be spotted, and Dr David Gillanders, whose guidance was both supportive and enabling.

A very special thank you goes to Dr Jennifer Lonsdale who not only recruited the most participants but helped with fun stuff like formatting, as well as, Dr Kenny Day and Ian Price who proof read sections of my thesis.

Finally, my love and thanks goes to my friends and family who provided constant encouragement and support throughout my training.

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## Abstract

Posttraumatic stress disorder (PTSD) is complex and no one theory can fully explain the development and maintenance of PTSD symptoms. In Scotland, where trauma focused care initiatives are being considered, little is known about the extent of trauma history and associated symptoms presenting in primary care services. Furthermore, subthreshold posttraumatic stress disorder (sPTSD) has recently been associated with clinically significant impairment. With PTSD symptoms often comorbid with other psychopathology such as depression, individuals potentially seek treatment for these symptoms rather than underlying trauma which therefore may go unrecognised. Studies on the effectiveness of psychological treatment for PTSD demonstrate reasonable efficacy for well developed interventions. However, up to half of individuals may not make significant clinical improvements and withdrawal rates are high. This suggests that current treatments are not acceptable to some individuals and may be ineffective for others.

In light of such clinical challenges the aim of the thesis was to investigate the incidence and nature of trauma symptoms in an Adult Psychological Therapies Service. Firstly, a systematic review was conducted to appraise the current level of evidence for prevalence and impairment associated with sPTSD. Secondly, an empirical study was undertaken to review the prevalence of trauma history and symptoms in the service. This was followed by an investigation of the relationships between processes posited to underpin many forms psychological distress by a promising new treatment approach called Acceptance and Commitment Therapy (ACT). These include; cognitive fusion, experiential avoidance and valued action. A quantitative cross sectional design collecting self report questionnaire data was used and mixed statistical methodology employed.



Results from the systematic review suggest that PTSD was associated with the most impairment, followed by sPTSD, then no PTSD. Subthreshold PTSD was reported to be as, or more prevalent than, PTSD. The results from the empirical study found 89 per cent reported exposure to one or more traumatic events, 51 per cent met PTSD screening criteria, whilst a further 7 per cent reached a sPTSD diagnostic cut-off. Trauma history was positively correlated with increased psychological distress at initial assessment. Cognitive fusion, experiential avoidance and valued action were all correlated with trauma symptom severity. Both cognitive fusion and experiential avoidance mediated the relationship between number of traumatic events and trauma symptom severity in a simple mediation model. However, multiple mediation analysis demonstrated that experiential avoidance, over and above cognitive fusion, explained 33 per cent of the variance. In addition, cognitive fusion and experiential avoidance jointly had a significant indirect effect on the relationship between trauma history and valued action. The implications of the findings and further directions are discussed.

# Chapter 1: Thesis Introduction

## 1.1 Introduction

Trauma seems to be an inescapable part of the human condition with the history of humankind as much about conflict and suppression, as culture and science. Along with natural disasters and social violence, most people in Western cultures will experience one or more potentially traumatic events during a lifetime (Keane *et al.*, 2006; Kessler *et al.*, 1995). Following such experiences, a significant number of people develop lasting psychological problems which range from mild anxiety or low mood, to debilitating symptoms which interfere with every aspect of functioning. The psychological impact following overwhelming terror has been recognised for centuries. As Manson, Friedman & La Bash (2007) point out it is evident in the 8<sup>th</sup> century BC literature attributed to Homer, right through to Kardiner (1941) who identified specific behavioural and cognitive disturbances following World War I (see Kolb, 1993 for a review). The organised study of human responses to trauma is however, relatively new and followed the important social movements of the 70's and the Vietnam War. The concept of 'posttraumatic stress disorder' (PTSD) became mainstream when it was introduced into the *Diagnostic and Statistical Manual of Mental Disorders*, (DSM-III) in 1980 (Friedman, Resick & Keane, 2007). Since then, the classification of PTSD has not been without controversy and of particular clinical relevance is the concept of 'subthreshold posttraumatic stress disorder' (sPTSD). This was introduced into the trauma literature in relation to the National Vietnam Veteran Readjustment Study in 1992 and was then termed 'partial PTSD' (Weiss *et al.*, 1992; Schnurr, Friedman & Rosenberg, 1993). It was recognised that there were a significant number of individuals who developed PTSD symptoms that caused distress and functional impairment, but which fell short of full diagnostic criteria (Blank, 1993). With subthreshold prevalence rates reported as at least equalling those of PTSD, there are clear clinical implications for the provision of care (Zlotnick, Franklin & Zimmerman, 2002).

Outcome studies which focus on the risk factors and socio-demographic correlates associated with PTSD have shown that the disorder is pervasive and that human responses to trauma may be extremely complex (Briere & Scott, 2006). Studies on the effectiveness of psychological treatment for PTSD have demonstrated reasonable efficacy for a number of well developed interventions such as Cognitive Behavioural Therapy (CBT) based approaches and Eye Movement Desensitisation and Reprocessing (EMDR). However, up to half of individuals entering such treatments may not make significant clinical improvements (Bradley *et al.*, 2005) and withdrawal from treatment is relatively common (Mendes *et al.*, 2008). This indicates that current treatments available are not acceptable to some individuals and are ineffective for others. As a result, there is a clear need for further research to develop new treatment approaches or refine existing ones.

In Scotland, the National Health Service Education for Scotland (NES) and the Scottish Executive (SE) published a document called 'The Matrix' (2008) which recognised increasing evidence for trauma focused care. However to date, little information exists on the prevalence rates of trauma history or PTSD in the United Kingdom (UK). For example, the National Institute for Clinical Excellence (NICE) Clinical Practice Guideline for the management of PTSD reports prevalence data from the United States of America (USA) (NICE, 2005). In Scotland, problems following traumatic life experiences are primarily managed through primary care services when help is sought by individuals. Adult psychological therapies services form part of this provision of care. Presently, clinicians, government and researchers in the UK must rely on epidemiological studies from the USA to make inferences about prevalence and plan services accordingly, with the clear clinical and economic implications that this brings. In addition, with evidence from recent research suggesting sPTSD is associated with significant functional impairment (Cukor *et al.*, 2010) which is reported to be comparable to that of PTSD (Zlotnick, Franklin & Zimmerman, 2002; Jeon *et al.*, 2007) this has even wider repercussions for such public health initiatives.

In light of the above clinical challenges and the trauma focussed care initiatives being considered in Scotland, which would affect primary care services, the aim of this thesis

is to investigate the incidence and nature of trauma in an Adult Psychological Therapies Service in the following way; firstly, a systematic review was conducted to appraise the current level of evidence for the prevalence and impairment associated with sPTSD. Secondly, an empirical study was undertaken to review the incidence of trauma history, trauma symptoms and associated psychological distress at initial assessment stages in the service. This was followed by a study of the relationships between a number of processes posited to underpin many forms psychological distress by a promising new treatment approach called Acceptance and Commitment Therapy (ACT).

The most salient outcomes of the thesis project will be presented as a Journal Article ready to be reviewed for dissemination once acceptance of the thesis project has been granted. The current thesis therefore addresses a number of the important issues outlined above by assessing the clinical utility regarding liberalising PTSD diagnostic criteria, providing localised incidence rates of both subclinical and full PTSD in a clinical sample, and investigating processes which may provide evidence for considering a new intervention or theoretical approach to PTSD. This project therefore has the potential to inform both local primary care psychology service provision and feed into wider trauma service planning in Scotland, as well as provide suggestions for future developments in addressing treatment efficacy issues.

## **Chapter 2: Systematic Review**

### **2.1 Title Page**

#### **Subthreshold PTSD versus full PTSD: A systematic review of prevalence and associated impairment**

(This is an extended thesis version which has been produced according to submission guidelines for; *Clinical Psychology and Psychotherapy*, see Appendix 1)

Short title for running head: Review of prevalence and impairment associated with subthreshold PTSD

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## 2.2 Abstract<sup>1</sup>

**Background:** Subthreshold forms of posttraumatic stress disorder (PTSD) have been associated with impairment and are reported to be as prevalent as PTSD. This has important implications for the planning and provision of care in Scotland and the rest of the United Kingdom (UK) where trauma focused care initiatives are being considered. This review examines current evidence for the prevalence and extent of impairment associated with sPTSD as compared to PTSD.

**Method:** A literature search for studies comparing PTSD to sPTSD in terms of impairment was conducted. Multiple electronic databases were searched; one relevant journal and all reference lists of included articles were hand-searched; all relevant primary authors and additional researchers in the field were contacted.

**Results:** Fifteen studies met inclusion criteria, though none of these were conducted with UK samples and there was a lack of research in the area of the review aims. Current evidence is based on mixed quality, heterogeneous research which generally did not address associated impairment as a primary research aim. The most consistent finding was that PTSD is associated with the most impairment followed by sPTSD then no PTSD after exposure to a traumatic event. All studies found sPTSD to be as, or more prevalent than, PTSD.

**Conclusion:** There is evidence for the clinical significance of impairment associated with sPTSD and that it is at least as prevalent as PTSD. Consensus on the definition of sPTSD and further investigation of associated impairment is warranted to address a gap in the literature.

*Key words:* Posttraumatic stress disorder, Subthreshold PTSD, Impairment, Prevalence

Word count: 245

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<sup>1</sup> Note that the headings for the systematic review have been numbered for the purpose of the thesis continuity and numbering would not be included for journal article submission.

## 2.3 Introduction

The concept of subthreshold posttraumatic stress disorder (sPTSD) was introduced into the trauma literature in relation to the National Vietnam Veteran Readjustment Study in 1992 and was then termed partial PTSD (Weiss *et al.*, 1992; Schnurr, Friedman & Rosenberg, 1993). It was recognised that there were a significant number of people who following traumatic combat related exposure, developed PTSD symptoms that caused distress and functional impairment, but fell short of full diagnostic criteria, i.e. full PTSD (Blank, 1993). Since then the concept of partial or subthreshold PTSD has been extended to a diverse range of civilian populations and types of trauma. For instance, researchers such as Blanchard *et al.* (1994, 1996) investigated PTSD symptoms following motor vehicle accidents, there are community studies by Stein *et al.* (1997, 2002) and Marshal *et al.* (2001), and the McQuaid *et al.* (2001) and Grubaugh *et al.* (2005) studies have focussed on primary care samples. In addition, Carlier & Gersons (1995) were among the first to investigate subthreshold forms of PTSD following natural disaster.

The collected findings from this body of research have prompted debate regarding the nosological structure of the diagnostic criteria for PTSD as outlined in the *Diagnostic and Statistical Manual of Mental Disorders, 4th ed.* (DSM-IV; American Psychiatric Association (APA), 1994) (Grubaugh *et al.*, 2005; Yufik & Simms, 2010). It is widely accepted that PTSD identifies individuals who experience persistent and marked psychosocial impairment, psychiatric co-morbidity and distress following exposure to a traumatic event (Kessler *et al.*, 1995). However, it has been argued that there is emerging evidence that the diagnostic cut off points overlook a large number of people with clinically significant difficulties (Cukor *et al.*, 2010). Some researchers are calling for further factor structure or taxonomical research to determine the utility of varying diagnostic criteria and formalising the concept of subclinical or partial forms of PTSD (Schützwohl & Maercker, 1999). With prevalence rates for sPTSD being reported as comparable to that of PTSD (Ozer *et al.*, 2008) and given indications that there may be many individuals who do not meet full diagnostic criteria but who require similar levels of care, such findings have important implications for the planning and provision of

public health services. Weiss *et al.* (1992) have pointed out that relying on the available empirical findings of the PTSD literature, which is DSM-IV diagnosis led, may lead to an underestimation of need. In addition, the International Consensus Group on Depression and Anxiety has reported that individuals who do not meet full diagnostic criteria for PTSD may still suffer significant psychosocial impairment (Ballenger *et al.*, 2000).

Although there is an alternative widely used diagnostic system called the *International Statistical Classification of Diseases* 10<sup>th</sup> edition (ICD-10; World Health Organisation (WHO), 1993), the majority of PTSD research is based on the DSM-IV criteria and has been completed in the United States of America (USA); therefore these criteria are reported in the present review. In addition, the term subthreshold PTSD will be used throughout the review for consistency and includes all related definitions of partial and subclinical forms of PTSD used in the literature. Posttraumatic stress disorder as defined by DSM-IV criteria requires that following exposure to a traumatic event (Criterion A), at least one of five re-experiencing symptoms (Criterion B), a minimum of three out of seven avoidance and numbing symptoms (Criterion C) and two out of five hyperarousal symptoms (Criterion D) are experienced. These symptoms have to be present for at least one month (Criterion E) and cause clinically significant functional impairment (Criterion F).

In the sPTSD literature, a number of definitions have been applied. Generally sPTSD has been defined as reporting clinically significant trauma related symptoms which are associated with a degree of impairment but which do not meet full diagnostic criteria (Grubaugh *et al.*, 2005). All definitions in the sPTSD literature have in common that the trauma exposure (A), time (E) and impairment criteria (F) must be met along with a pre-defined threshold in the rest of the symptom categories. The earliest definition is that of Schnurr, Friedman & Rosenberg (1993) where either full criterion are met for clusters B and D or full criteria are met for B with at least one symptom being present in both C and D. The Blanchard *et al.* (1994) research group defined sPTSD as reporting at least one re-experiencing symptom from cluster B and meeting either criterion C or D. Another widely used definition (sometimes referred to as partial PTSD), is that



individuals are required to have at least one symptom in each of the above clusters B, C and D (Stein *et al.*, 1997). More recently Mylle & Maes (2002) proposed a definition where full criteria are met for two out of the three (B, C or D) symptom clusters.

Reported rates of sPTSD are wide ranging. This may in part be due to different definitions of sPTSD being employed in different studies investigating prevalence. However, studies using the Blanchard *et al.* (1994) or Stein *et al.* (1997) definitions (above) have reported widely varying current sPTSD rates from 3.7 per cent in a community survey (Stein *et al.*, 1997), 7 per cent in a psychiatric outpatient sample (Zlotnick *et al.*, 2004) and 11.1 per cent in a telephone survey (Zhang, Ross & Davidson, 2004). Lifetime prevalence rates of 2.7 per cent have been reported in a South Korean community sample (Jeon *et al.*, 2007), 9 per cent in a psychiatric outpatient sample (Franklin, Sheeran & Zimmerman, 2002) to as high as 44 per cent in trauma specific samples such as motor vehicle accident victims (Blanchard *et al.*, 1994). Comparably high lifetime prevalence rates have been demonstrated in military populations. For instance, 30.9 per cent prevalence was reported among males in a study of Vietnam veterans by Weiss *et al.*, (1992). Similarly wide ranging prevalence rates for different index traumas and community samples are found in the PTSD literature as a whole (Keane *et al.*, 2006).

One of the limitations in the current sPTSD literature is that lifetime PTSD and comorbid psychological problems are not routinely assessed, which makes it difficult to ascertain if the level of impairment reported is actually associated with a clinical picture of sPTSD or not. As a result, distress and impairment may be associated with the presence of comorbid disorders rather than subthreshold symptoms of PTSD (Marshall *et al.*, 2001). Due to the nature and course of PTSD, if studies do not report or control for lifetime PTSD, it is difficult to determine if the symptoms are associated with sPTSD, are remitting PTSD symptoms, or indeed symptoms which may subsequently develop into delayed PTSD. In such studies, it cannot be shown whether reported sPTSD makes up a distinct sPTSD profile or not (Norman, Stein & Davidson, 2007). Additionally, most sPTSD literature relies on retrospective reporting of symptoms which depend on memory and increases the risk of associated bias. Further

methodological difficulties are encountered in the research. These include a reliance on self-selecting samples such as treatment seeking individuals at a psychiatric outpatient department (Zlotnick, Franklin & Zimmerman, 2002), or callers to the Anxiety Disorders Association of America seeking advice on anxiety issues (Zhang, Ross & Davidson, 2004). There is also reliance on convenience samples of single type traumas which may not generalise to PTSD populations as a whole (Cukor *et al.*, 2010).

Despite a growing body of literature from both empirical research and clinical practice, which supports a dimensional construct of PTSD (Grubaugh *et al.*, 2005), very little research has been done on subsyndromal trauma disorders. Entering 'PTSD' as a keyword into the OVID PsycINFO database in December 2010 returned 18205 hits whilst entering 'subthreshold PTSD' along with synonyms (subsyndromal, partial, subclinical and borderline) returned a total of 242 hits with duplicates. There are a number of potential reasons that such a seemingly useful clinical concept is under-represented in the trauma research and literature. Firstly, no consensus has been reached regarding the definition of subthreshold PTSD. Secondly, subthreshold and partial PTSD are relatively recent concepts, only entering the literature in the early 90's with the diagnostic category of PTSD only ten years older than that. Thirdly, existing psychometric assessments are based on a DSM-IV diagnosis of PTSD therefore many studies only include cases which reach threshold. Lastly, it is reasonable to suggest that much PTSD research has reported continuous symptom severity data which has not been grouped categorically. That is, the different levels of PTSD symptomatology have not been differentiated into PTSD and sPTSD and therefore would not be identified for the present review.

In Scotland, the National Health Service Education for Scotland (NES) and the Scottish Executive (2008) published a document titled 'The Matrix' which recognised increasing evidence for trauma focused care. With evidence from recent research suggesting that sPTSD is associated with significant functional impairment (Cukor *et al.*, 2010), in some instances reported to be comparable to that of PTSD (Zlotnick, Franklin & Zimmerman, 2002; Jeon *et al.*, 2007) there are clear implications for such public health initiatives. However, there is also counter evidence that sPTSD has far less severe

consequences than PTSD (Breslau, Lucia & Davis, 2004). In light of such developments, the aim of this systematic review is to appraise current evidence for the prevalence of PTSD with a special focus on what is known about the impairment associated with sPTSD. This enables an assessment of the clinical utility regarding liberalising diagnostic criteria to inform primary care psychology service provision and planning in Scotland.

## **2.4 Method**

### **2.4.1 Inclusion and Exclusion Criteria**

As the aim of this review is, in part, to inform clinical practice, the paper focuses on a civilian population exposed to a wide range of types of traumatic experiences and excludes military populations. There are a number of reasons why military samples were excluded. Firstly, on reviewing the literature there were many studies which investigated PTSD symptoms in war veterans a substantial time after war experiences and it has been shown that self rated war related trauma symptoms are higher with increasing time since conflict (Orth & Wieland, 2006). Secondly, military samples generally report higher incidence of PTSD symptoms (Ozer *et al.*, 2008) and in the sPTSD literature this is one of the most commonly investigated groups followed by specific trauma patient groups. For example, high intensity warfare PTSD prevalence rates of 59 per cent were reported by Hashemian *et al.* (2006). As a result, including military populations may inflate the results obtained in a systematic review of this nature. Similarly, groups of refugees who have been exposed to armed conflict demonstrate high PTSD prevalence but no studies which met inclusion criteria were found for this population. It should be noted that military and refugee populations remain instrumental in understanding reaction to trauma, and thus the systematic review of the sPTSD findings of such populations is warranted in its own right but is beyond the scope of this review.

The present review includes civilian adult populations of either gender or any ethnicity, within the age range of 16 to 85. A broad age range was chosen so that valuable community studies were not excluded. Only studies which compared sPTSD (however defined) with PTSD who reported both prevalence and levels of impairment, were eligible for inclusion. Due to the relatively small research area of sPTSD, prospective, retrospective or cross-sectional and longitudinal studies were all eligible as were studies which looked at either current or lifetime PTSD rates. Studies which included participants with traumatic brain injury, pre-existing current psychiatric or neurological conditions, cognitive impairment, co-morbid substance misuse or eating disorder were excluded. Only research articles in peer reviewed journal articles were included and therefore abstracts retrieved from dissertations or book chapters were excluded. Due to time and resource limitations in acquiring translation services, only those studies published in English could be included in this review.

#### ***2.4.2 Identification and Inclusion Process***

An initial literature search was conducted in December 2010 to confirm whether a similar review had been performed. This search utilised the PsycINFO Database as well as the online Cochrane Database of Abstracts of Reviews of Effects (DARE) and encompassed all PTSD systematic reviews and meta-analyses. No such reviews were identified. All terminology equivalents of posttraumatic stress disorder and synonyms for subthreshold were combined together in turn as follows: ('PTSD', 'posttraumatic stress disorder', 'post-traumatic stress disorder') with ('subthreshold', 'sub-threshold', 'subclinical', 'sub-clinical', 'subsyndromal', 'sub-syndromal', 'partial', 'borderline') .

In January 2011, again using the above combinations, the following electronic databases were searched: PsycINFO (1989-2010); CINAHL (1989-2010); EMBASE (1989-2010); and Medline (1989-2010). The resulting texts identified were screened for inclusion by retrieving the titles and abstracts of all articles. A total of 276 were obtained and screened with all dissertation abstracts, foreign language articles, book chapters and research exclusively with military populations excluded at this stage. Following this, all

articles that seemed to meet inclusion criteria, as well as those where there was a degree of ambiguity were retrieved in full. Of the 82 articles that were to be reviewed in full, 3 were unobtainable through online access or inter-library loans and therefore were not screened for this review. A flow chart of this process is outlined in Figure 1.

To address publication bias, the author contacted the primary researchers in the field to obtain any relevant unpublished studies which may meet inclusion criteria. All fifteen primary authors plus a further five researchers who had widely published research on sPTSD were approached via email. Of those who were contacted, eight responded<sup>2</sup>. From this process, a further 41 articles were screened but none met inclusion criteria and were predominantly research regarding predictors of impairment, or treatment of, full PTSD. In addition, the reference lists of all articles meeting inclusion criteria were screened and the *Journal of Traumatic Stress* was hand searched to check for additional texts which may have met inclusion criteria. Only one relevant journal was hand searched due to the utilisation of an over-inclusive search strategy which identified all articles using any term related to subthreshold PTSD as a keyword. As the review was conducted by one author, all searches were performed twice and coded in a spreadsheet for ease of cross referencing and in an attempt to reduce possible error. Following this process, 21 studies met all the inclusion criteria. Upon further detailed review, an additional six articles were excluded; The Chung *et al.* (2007a and 2007b) studies either did not define sPTSD at all or required that only one PTSD symptom was present. This would make it difficult to distinguish the sPTSD from non PTSD group. The Chen *et al.* (2007) study was excluded as the comparison groups joined the diagnosis PTSD with major depression. A further three studies did not measure impairment associated with PTSD symptoms and reported only comorbid depression and anxiety symptoms as an outcome (Asmundson *et al.*, 1998; Dolberg *et al.*, 2010), or reported a global severity index only (Schützwohl & Maercker, 1999). This left a final total of 15 research articles which estimated prevalence and evaluated impairment associated with sPTSD as compared to PTSD for review. The author and a second reviewer read and performed independent quality assessments of all included studies.

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<sup>2</sup> A list of researchers contacted by email has been included in Appendix 2 of the thesis.

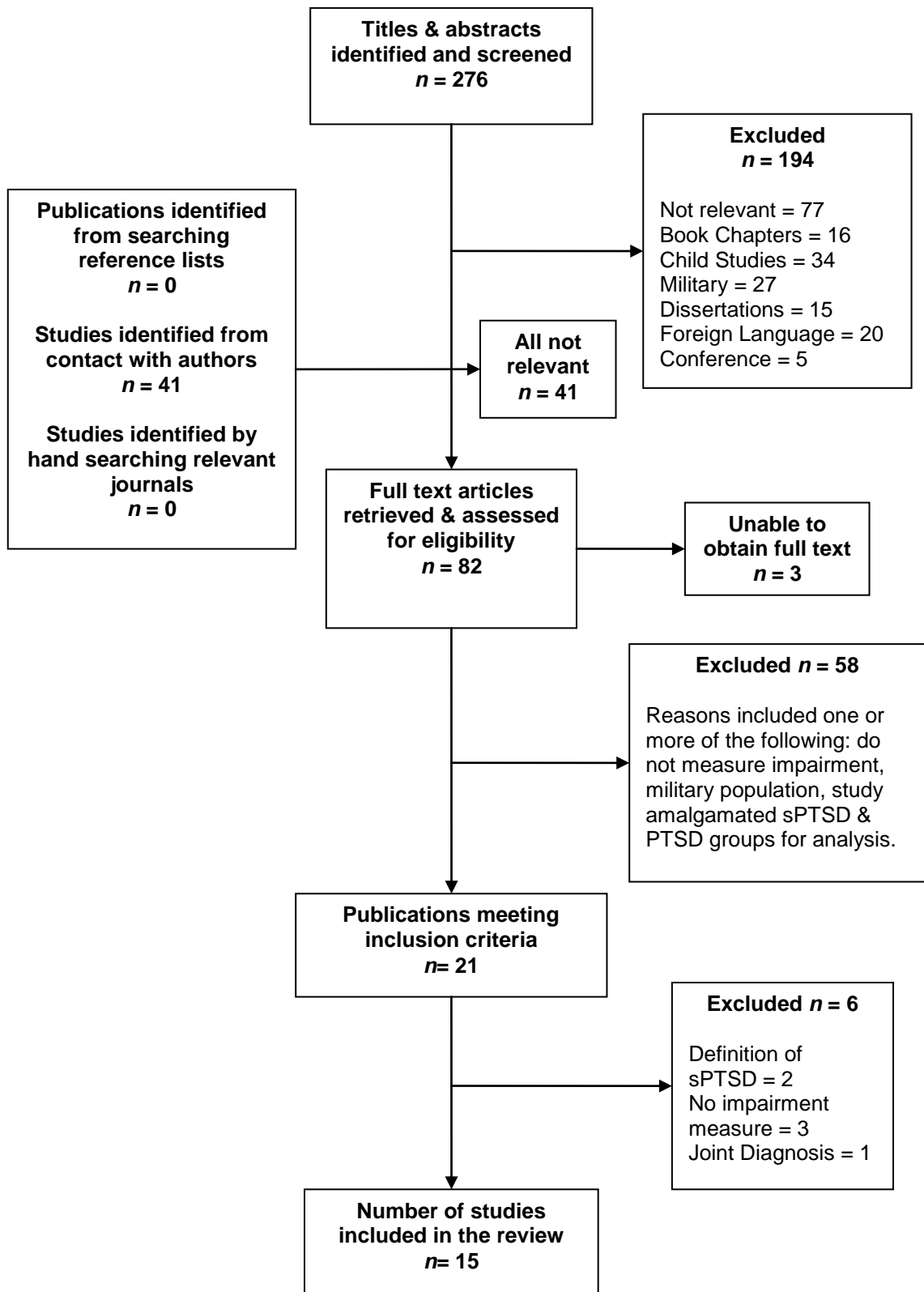


Figure 1: Flow chart of study selection process for systematic review

### 2.4.3 Quality Assessment of Included Studies

Current guidelines and check-lists have predominantly been developed to evaluate the effectiveness of treatment interventions based on randomised controlled trial methodologies (see for example the Centre for Reviews and Dissemination, Scottish Intercollegiate Guidelines Network (SIGN), National Institute for Health and Clinical Excellence (NICE), Consolidated Standards of Reporting Trials (CONSORT) and the Higgins & Green, 2011 Cochrane guidelines). Although such guidance includes an assessment of the quality of research, many criteria were not applicable for the present review. Consequently, the current study identified a number of important quality criteria in terms of the present review topic *a priori*. These were based on both NICE and SIGN methodology guidelines for cohort studies and include the following nine checklist items<sup>3</sup>:

- There was a clear method for the assignment of groups i.e. symptom measurement cut off points are stipulated for subthreshold and full PTSD groups.
- The subjects in each group are comparable or extraneous variables are controlled for (i.e. subgroup analyses of gender/age/other factors have been performed).
- The main comorbidities are identified and controlled for e.g. comorbid depression.
- Type of design: retrospective versus prospective (only prospective studies could obtain a good rating, see below).
- Current prevalence, lifetime prevalence or both are reported (only studies reporting or controlling for lifetime prevalence could obtain a good rating).
- Functional impairment was adequately assessed (in design of study, method and outcome measures used).
- Psychometric properties of primary outcome measures are shown to be both valid and reliable. Specifically, the reliability of self report measures was reported (only studies which used clinician rated measures or both clinician and self report measures could obtain a good rating).
- Statistical analysis:
  - a) Confidence intervals, odds ratios or standard error has been reported
  - b) A power analysis for the given sample size has been reported
- Generalisability, limitations and implications are clearly discussed.

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<sup>3</sup> A copy of the checklist developed is included in Appendix 3 of the thesis.

Each study was graded across all nine items independently by the author and a second rater using the following scale: 0 = unacceptable, 1 = acceptable and 2 = good. The scores for the items were added up and an average worked out to provide an overall rating. Total scores were rounded up with a cut off of 1.5 being given a rating of good (i.e. 2). Those which fell below this figure received a rating of 1 or 'acceptable'<sup>4</sup>.

## **2.4.4 Characteristics of Included Studies**

### **2.4.4.1 Design**

The 15 studies included in this review and their main characteristics are outlined in Table 1. When gender ratios were not reported percentages were calculated using the data provided in the study. The majority of studies were cross-sectional in design, relying on retrospective reporting of trauma symptoms with only two prospective, longitudinal studies (Cukor *et al.*, 2010 and Shelby, Golden-Kreutz & Anderson, 2008) meeting inclusion criteria for this review.

### **2.4.4.2 Trauma Type Investigated**

Two studies researched accident survivor populations (Matthews & Chinnery, 2005; Baranyi *et al.*, 2010) with four studies concentrating on samples exposed to workplace trauma such as police, disaster recovery workers and ambulance workers (Berger *et al.*, 2007; Martin, Marchand & Boyer, 2009; Cukor *et al.*, 2010; Maia *et al.*, 2007). A further six studies reported on mixed trauma type samples (Jeon *et al.*, 2007; Stein *et al.*, 1997; Zhang, Ross & Davidson, 2004; Gillock *et al.*, 2005; Breslau, Lucia & Davis, 2004; Zlotnick, Franklin & Zimmerman, 2002) and the remaining three researched specific populations of earthquake survivors (Lai *et al.*, 2004), breast cancer survivors (Shelby, Golden-Kreutz & Anderson, 2008), and liver transplant patients (Rothenhäusler *et al.*, 2002).

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<sup>4</sup> See the results section below (Table 5) for the overall rating given to each of the included studies



*Table 1: Main Characteristics of the Studies Included for a Systematic Review of Subthreshold PTSD versus Full PTSD*

Study	Country	Sample	Broad Trauma Type	Sample Size	Participant Characteristics	
					Age, Mean(SD)/Range	Male/ Female (%)
Baranyi et al. (2010)	Austria	Severely injured accident victims	Accident	52	37.6 (14.2)	73.1 / 26.9
Berger et al. (2007)	Brazil	Ambulance workers	Work related	234	32.4 (6.3)	76.9 / 23.1
Breslau et al. (2004)	USA	Community	Mixed	1606	18 - 45	44.9 / 55.1
Cukor et al. (2010)	USA	Recovery workers WTC	Work related	3360	43.8 (9.6)	97 / 3
Gillock et al. (2005)	USA	Primary care	Mixed	232	4.9 (10.5)	31 / 69
Jeon et al. (2007)	S Korea	Community	Mixed	6258	18 - 64	Not reported
Lai et al. (2004)	Taiwan	Earthquake survivors	Natural disaster	252	55 (17.3)	53 / 47
Maia et al. (2007).	Brazil	Police	Work related	157	32.9 (5.5)	All male
Martin et al. (2009)	Canada	Police	Work related trauma	159	43.5 (12.2)	84.2 / 15.7
Matthews & Chinnery (2005)	Australia	Accident survivors	Accident	69	36.9 (9.2)	55 / 45
Rothenhäusler et al. (2002)	Germany	Liver transplant patients	Medical	75	54 (19.9)	57 / 43
Shelby et al. (2008)	USA	Breast cancer survivors	Medical / Mixed	74	31 - 84	All female
Stein et al. (1997)	Canada	Community	Mixed	1002	18 - >65	47.7 / 52.3
Zhang et al. (2004)	USA	Callers to ADAA	Mixed	288	40.9 (10.7)	30.2 / 69.8
Zlotnick et al. (2002)	USA	Psychiatric outpatient	Mixed	1300	38.4 (12.4)	36 / 64

*Note.* ADAA= Anxiety Disorders Association of America; SD = Standard Deviation; USA= United States of America; WTC = World Trade Centre; S = South.

#### **2.4.4.3 Definition of Subthreshold PTSD applied**

For all the subthreshold PTSD definitions reviewed, DSM IV criteria for A (trauma exposure), E (duration) and F (impaired functioning) must be present with different combinations of symptoms in the re-experiencing (B), avoidance (C) and arousal (D) clusters making up the different sPTSD descriptions. Table 2 outlines the differing definitions used across the studies reviewed and compares them to full DSM-IV diagnostic criteria in terms of minimum number of symptoms required and which symptom clusters must be present for the particular sPTSD definition.

Five studies (Breslau, Lucia & Davis, 2004; Jeon *et al.*, 2007; Lai *et al.*, 2004; Stein *et al.*, 1997, Zhang, Ross & Davidson, 2004) used the Stein *et al.* (1997) definition. Three studies used the Blanchard *et al.* (1994) namely, Baranyi *et al.* (2010), Cukor *et al.* (2010) and Matthews & Chinnery (2005). A further three studies (Berger *et al.*, 2007; Maia *et al.*, 2007; Rothenhäusler *et al.*, 2002) applied the Mylle & Maes (2002) definition. The Martin, Marchand & Boyer (2009) and Gillock *et al.* (2005) studies use the definition put forward by Schnurr, Friedman & Rosenberg (1993).

Two studies used their own definitions. The Zlotnick, Franklin & Zimmerman (2002) paper defined sPTSD as '...clinically significant symptoms that fell below the DSM-IV symptoms threshold to diagnose PTSD' (p.415). This study was included as the paper went on to demonstrate that patients reporting trauma with few to no symptoms were placed in a trauma histories only comparison group. This is in contrast to the Chung *et al.* (2007b) study which was excluded as this definition required that only one symptom across all clusters was present and did not show how this group differed from a 'no PTSD' group. The Shelby, Golden-Kreutz & Anderson, (2008) defined sPTSD as meeting criteria for either C or D or having at least five or more symptoms across all clusters.

Table 2: Subthreshold PTSD Definitions compared to Full DSM-IV Criteria for PTSD

Definition	Criterion B Re-experiencing	Criterion C Avoidance & Numbing	Criterion D Hyperarousal	Min Number of Symptoms for Definition
<i>DSM-IV PTSD</i>	<i>At least 1 of 5</i>	<i>At least 3 of 7</i>	<i>At least 2 of 5</i>	6
Schnurr et al. (1993) <sup>1</sup>	At least 1 of 5 (i.e. full criteria met)		At least 2 of 5 (i.e. full criteria met)	3
Schnurr et al. (1993) <sup>2</sup>	At least 1 of 5 (i.e. full criteria met)	At least 1 of 7	At least 1 of 5	3
Blanchard et al. (1994) <sup>1</sup>	At least 1 of 5 (i.e. full criteria met)	At least 3 of 7 (i.e. full criteria met)		4
Blanchard et al. (1994) <sup>2</sup>	At least 1 of 5 (i.e. full criteria met)		At least 2 of 5 (i.e. full criteria met)	3
Stein et al. (1997)	At least 1 of 5 (i.e. full criteria met)	At least 1 of 7	At least 1 of 5	3
Mylle & Maes (2002) <sup>1</sup>	At least 1 of 5 (i.e. full criteria met)	At least 3 of 7 (full)		4
Mylle & Maes (2002) <sup>2</sup>		At least 3 of 7 (i.e. full criteria met)	At least 2 of 5 (i.e. full criteria met)	5
Mylle & Maes (2002) <sup>3</sup>	At least 1 of 5 (i.e. full criteria met)		At least 2 of 5 (i.e. full criteria met)	3

Note: Full criteria met denotes that full DSM-IV criterion are required to be met for the given cluster in the subthreshold definition; Superscripts 1,2 or 3 distinguishes between more than one description given for a subthreshold definition; DSM-IV = Diagnostic and Statistical Manual of Mental Disorders 4th edition; PTSD = Posttraumatic Stress Disorder; Min= Minimum.

#### 2.4.4.4 PTSD Measures Used

To classify groups, a mix of clinician administered and self report measures based on DSM-IV criteria were utilised with the exception of Rothenhäusler *et al.* (2002) who used the Structured Clinical Interview for the DSM-III-R (SCID; Spitzer *et al.*, 1999) to generate DSM-IV diagnoses. This was possible as PTSD symptoms had been rearranged but were not changed between DSM editions. Later versions of patient and non-patient editions of the SCID (First *et al.*, 1995,1996) were used in a number of further studies (Zlotnick, Franklin & Zimmerman, 2002; Shelby, Golden-Kreutz & Anderson, 2008; Martin, *et al.*; 2009; Cukor *et al.*, 2010, Baranyi *et al.*, 2010) either as a primary PTSD measure or for obtaining comorbid diagnoses.

The Clinician Administered PTSD Scale (CAPS; Blake *et al.*, 1995) is one of the most widely used and well validated structured instruments (Weathers, Keane & Davidson, 2001) but was only used by two studies as the primary method of assigning groups (Cukor *et al.*, 2010; Baranyi *et al.*, 2010). The Berger *et al.* (2007), Gillock *et al.* (2005), Matthews & Chinnery (2005) and Maia *et al.* (2007) studies based group allocation entirely on a self report measure called the PTSD Checklist - Civilian Version (PCL-C; Weathers *et al.*, 1993). Zhang, Ross & Davidson (2004) and Lai *et al.* (2004) used the Mini International Neuropsychiatric Interview (MINI; Sheehan *et al.*, 1998) along with various trauma history questionnaires to diagnose PTSD. This is a structured diagnostic interview based on DSM-IV diagnoses. One study used a modified version of the National Institute of Mental Health Diagnostic Interview Schedule (NIMH-DIS; Robins *et al.*, 1995) for a telephone interview, reported high agreement between instruments in a separate validation study using a stratified random subset of the sample (Breslau, Lucia & Davis, 2004). Finally, Stein *et al.* (1997) developed a standardised telephone interview based on DSM-IV criteria and Jeon *et al.* (2007) used a Korean version of the Composite Diagnostic Interview (K-CIDI; World Health Organisation (WHO), 1997) both of which were validated within the given studies.

### 2.4.5 Prevalence

The overall prevalence rates for full and subthreshold PTSD varied substantially with sPTSD being reported as equally prevalent, or more prevalent than PTSD in most cases. Table 2 outlines the prevalence rates reported for each study by trauma type. The combined average prevalence rate for PTSD was 9.8 per cent compared to 15.2 per cent for sPTSD. In summary, in the studies reviewed here, sPTSD was more prevalent across a broad range of trauma types.

*Table 3: Prevalence of PTSD and sPTSD by Trauma Type*

Broad Trauma Type	PTSD (%)	sPTSD (%)	Study
Accident	17.4	27.5	Matthews & Chinnery (2005)
	25.0	21.2	Baranyi et al. (2010)
Mixed	1.7	2.7	Jeon et al. (2007)
	2.0	1.9	Stein et al. (1997)
	8.0	11.1	Zhang et al.(2004)
	9.0	25.0	Gillock et al. (2005)
	9.4	27.7	Breslau et al. (2004)
	12.0	7.0	Zlotnick et al. (2002)
Work Place Trauma	5.6	15.0	Berger et al. (2007)
	7.6	7.0	Martin et al. (2009)
	8.2	9.7	Cukor et al. (2010)
	8.9	16.0	Maia et al. (2007)
Medical	16.2	20.3	Shelby et al. (2008)
	5.3	17.3	Rothenhäusler et al. (2002)
Natural Disaster	10.3	19.0	Lai et al. (2004)

Note: PTSD = Posttraumatic Stress Disorder, sPTSD = Subthreshold Posttraumatic Stress Disorder.

#### **2.4.6 Associated Functional Impairment**

The range of impairment measures used varied widely, from unstandardised work related functioning questions to health related quality of life measures such as the Short Form Health Survey (SF-36; Ware *et al.*, 1997). Only one study (Cukor *et al.*, 2010) used a standardised measure covering a variety of impairment domains including; occupational, social and family functioning using the Sheehan Disability Scale (SDS; Sheehan, 1983). These measures are outlined in Table 4 along with the main *post hoc* or model testing results obtained by each study.

Three research groups found no significant difference between the sPTSD and no PTSD groups in terms of the impaired functioning investigated (Maia *et al.*, 2007; Martin, Marchand & Boyer, 2009; Shelby, Golden-Kreutz & Anderson, 2008). Three studies reported that the full PTSD group was comparable with the subthreshold group in terms of impairment on all, or some of, the dysfunction indicators measured (Jeon *et al.*, 2007; Lai *et al.*, 2004, Stein *et al.*, 1997). The Barayani *et al.* (2010) and Zlotnick, Franklin & Zimmerman (2002) studies reported significant *post hoc* results for the pair-wise comparison between PTSD and no PTSD groups only with the sPTSD group not differing statistically from either the full or no PTSD groups. *Post hoc* pair-wise results in the Berger *et al.* (2007) study reported statistically significant results on four subscales of a health related quality of life measure called the Short Form Health Survey (SF-36; Ware *et al.*, 1997) between the PTSD and no PTSD group. On only one subscale (general mental health) was there a statistically significant difference between the sPTSD and no PTSD groups.

Similarly, Gillock *et al.* (2005) found significant pair-wise results for four of the SF-36 domains between full PTSD and no PTSD as well as sPTSD and no PTSD. There were also statistically significant differences in the Bodily Pain and Physical Functioning subscales between full and subthreshold PTSD. The remaining five studies (Breslau, Lucia & Davis, 2004; Cukor *et al.*, 2010; Mathews & Chinnery, 2005; Rothenhäusler *et al.*, 2002; Zhang, Ross & Davidson, 2004) reported a dimensional pattern in the degree

of associated impairment. That is, the studies reported significant differences between all three groups with the PTSD group showing more impairment than the sPTSD group which in turn reported more impairment than the no PTSD group on functional impairment indicators employed in the respective studies.

*Table 4: Functional Impairment Results*

Study	Impairment Measure	Statistics/Analysis	Post Hoc Results between groups	Domains or Subscales in Which Post Hoc or Model Testing Results Were Obtained
Baranyi et al. (2010)	SF-36	ANOVA / Post hoc	1 > 3	Role Physical, Vitality, Role Emotional, & Mental Health
Berger et al. (2007)	SF-36	MANOVA / Post hoc	1 > 3	Role Physical, Vitality, Role Emotional, & Mental Health
Breslau et al. (2004)	4 Impairment days questions	Multiple regression controlling for gender, age & employment	2 > 3 1 > 2 > 3	Mental Health subscale only Work loss, cut down work, less time with people, tension/disagreements
Cukor et al. (2010)	SDS	ANOVA / Post hoc	1 > 2 > 3	Occupational , social, family/leisure and overall impairment in functioning
Gillock et al. (2005)	SF-36 (Physical sub scales only)	MANOVA / Post hoc	1 > 3 & 2 > 3 1 > 2	General Health, Bodily Pain, Physical Functioning, Role Physical Bodily Pain, Physical Functioning subscales only
Jeon et al. (2007)	WHODAS II (FD8 module)	Student's t-test	1 = 2 > 3	Mean dysfunctional work days/work loss days
Lai et al. (2004)	SDS	Multiple regression controlling for gender, age & education	1 = 2 > 3	Occupational , social, family/leisure and overall impairment in functioning
Maia et al. (2007).	GHQ-12	Student's t-test	1 > 2 = 3	Overall impairment in psychosocial functioning
Martin et al. (2009)	Study designed questions	Fisher exact test	1 > 2 = 3	Medical appointments, consultation with mental health, alternative therapies, sick leave



Matthews & Chinnery (2005)	WPP	ANOVA / Post hoc	1 > 2 > 3	WPP summary score
Rothenhäusler et al. (2002)	SF-36	ANOVA / Post hoc	1 > 2 > 3	Physical Functioning, Role Physical, General Health, Vitality, Role Emotional, & Mental Health
Shelby et al. (2008)	LSCL-R & SF-36	ANOVA / Post hoc	1 > 2 = 3	Functional performance status, physical health related quality of life & mental health-related quality of life
Stein et al. (1997)	Study designed questions	ANOVA / Post hoc	1 > 2 > 3 1 = 2 > 3	Work or school functioning Home and social functioning
Zhang et al. (2004)	WPAI	ANOVA / Post hoc	1 > 2 > 3	Unemployment, work missed, reduced work productivity
Zlotnick et al. (2002)	SADS (Social & work impairment items)	MANCOVA	1 > 3 1 > 3 1 > 3	Current social functioning Past social functioning Days out of work

Note. 1 = PTSD Group; 2 = Subthreshold Posttraumatic Stress Disorder (sPTSD) Group; 3 = No PTSD Group; SF-36 = Short-form Health Survey; SDS = Sheehan Disability Scale; WHODAS II = World Health Organisation Disability Assessment Schedule II; GHQ 12 = General Health Questionnaire; ANOVA = Analysis of Variance; MANOVA = Multivariate Analysis of Variance; WPP = Work Potential Profile; LSCL-R = Life Stressor Checklist-Revised; WPAI = Work Productivity and Adjustment Inventory; SADS = Schedule for Affective Disorders.

### **2.4.7 Quality of the Included Studies**

The overall ratings and agreement between the author and second rater for each study using the nine quality criteria described above is outlined in Table 5. There was good overall agreement of 74 per cent between the reviewers with no differences of maximum magnitude (i.e. 2 point discrepancy) on any of the nine items across all the reviewed studies. Where there were one point differences, areas of disparity were reviewed and an overall score agreed. Whilst the rating scale developed is not a standardised comparative measure, it offers a guide to the relative methodological strengths of the included studies in specific terms of the outlined systematic review question.

The results obtained from the quality rating exercise suggest that the Breslau, Lucia & Davis (2004), Cukor *et al.* (2010), Jeon *et al.* (2007), Lai *et al.* (2004) and Zlotnick *et al.*, (2002) studies were methodologically the strongest in terms of the review question. The Shelby, Golden-Kreutz & Anderson (2008) study was approaching a good rating but a small sample size in the sPTSD group ( $N = 5$ ) reduced this rating somewhat. Two further studies (Baranyi *et al.*, 2010; Rothenhäusler *et al.*, 2002) had relatively small sample sizes (52 and 75 respectively) and neither reported power calculations. It may be that such studies with as few as four in PTSD and 13 in sPTSD (Rothenhäusler *et al.*, 2002) or 13 and 11 in respective PTSD groups (Baranyi *et al.*, 2010) did not have adequate power to detect differences between the full and sPTSD groups.

*Table 5: Quality of Studies Included in Systematic Review*

Study	Rater 1 (Overall Rating)	Rater 2 (Overall Rating)	Final Agreement
Baranyi et al. (2010)	1	2	1
Berger et al. (2007)	1	1	1
Breslau, Lucia & Davis (2004)	2	2	2
Cukor et al. (2010)	2	2	2
Gillock et al. (2005)	1	1	1
Jeon et al. (2007)	2	1	2
Lai et al. (2004)	2	2	2
Maia et al. (2007).	1	1	1
Martin, Marchand & Boyer (2009)	1	1	1
Matthews & Chinnery. (2005)	1	1	1
Rothenhäusler et al. (2002)	1	1	1
Shelby, Golden-Kreutz & Anderson (2008)	1	2	2
Stein et al. (1997)	1	1	1
Zhang, Ross & Davidson (2004)	1	1	1
Zlotnick et al. (2002)	2	2	2

Note: 2 = Good; 1= Adequate, 0 = Poor.

Four studies reported lifetime prevalence of PTSD when comparing current symptoms (Cukor *et al.*, 2010, Jeon *et al.*, 2007, Lai *et al.*, 2004 and Shelby, Golden-Kreutz & Anderson, 2008). Only one study was prospective in design and followed the course of subthreshold symptoms over three years (Cukor *et al.*, 2010). A further study included a prospective arm to the study, following and screening patients for cancer related PTSD over 18 months (Shelby, Golden-Kreutz & Anderson, 2008). This suggests that an absence of controlling for lifetime prevalence may present a methodological flaw in the remaining studies. Similarly, a number of studies were found neither to report on, nor control for, comorbidities such as depression or other psychiatric disorders (Berger *et al.*, 2007; Breslau, Lucia & Davis, 2004; Gillock *et al.*, 2005; Maia *et al.*, 2007).

A range of PTSD diagnostic measures including self-rated and clinician-administered scales (reviewed above) were used. Four studies obtained only an 'adequate' rating as they relied upon a self report measure for diagnostic purposes (Berger *et al.*, 2007); Gillock *et al.*, 2005; Matthews & Chinnery., 2005; Maia *et al.*, 2007). Only the Cukor *et al.* (2010) and Baranyi *et al.* (2010) studies used the clinician administered PTSD scale considered the 'gold standard' (Weathers, Keane & Davidson, 2001). However, a number of other studies received a 'good' rating as they applied a range of both standardised clinician administered, structured interviews and self report measures (Zlotnick *et al.*, 2002; Lai *et al.*, 2004; Jeon *et al.*, 2007; Baranyi *et al.*, 2010).

Lastly, only three community based studies investigated representative mixed trauma type samples (Breslau, Lucia & Davis, 2004; Jeon *et al.*, 2007; Stein *et al.*, 1997), therefore the generalisability of the remaining studies may be limited to specific groups. Unfortunately, the three community studies noted were not cross cultural and thus such findings would also need to be replicated in alternate cultural contexts.

## 2.5 Discussion

On the basis of the present review there is inconclusive evidence regarding the degree of disability and impairment associated with subthreshold PTSD as compared to full PTSD following exposure to traumatic life events. This is partly due to the limited number of studies which met inclusion criteria and partly the mixed quality of these studies in terms of the review aim. There was insufficient evidence to support earlier claims by researcher such as Zlotnick, Franklin & Zimmerman (2002) and Jeon *et al.* (2007) that sPTSD does not significantly differ from PTSD in terms of functional impairment. However, evidence from studies rated as ‘good’ by this review, indicated that significantly more impairment was associated with sPTSD when compared to no PTSD. A diagnosis of ‘full’ PTSD corresponded with the most severe impairment. The most consistent outcome reported across the studies reviewed here was a dimensional or linear association of disability with sub clinical forms of PTSD versus PTSD. That is, PTSD groups showed more impairment in functioning than sPTSD groups, who in turn reported more impairment than no PTSD groups. This finding supports a suggestion that PTSD diagnostic criteria lie on a continuum, where the highest number of trauma symptoms identify the most extreme cases of PTSD at one end, and subclinical or partial forms identify clinically relevant, but less severe problems below that threshold. This is in line with a number of studies across both civilian (Cukor *et al.*, 2010; Mylle & Maes, 2004; Marshal *et al.*, 2001; Breslau, Lucia & Davis, 2004) and military populations (Yarvis *et al.*, 2005; Jakupcak *et al.*, 2007) which report similarly linear relationships.

With regard to prevalence, all studies, despite using a range of sPTSD definitions (including relatively conservative ones), reported that partial forms were as prevalent, or more prevalent than, PTSD across a variety of trauma types. This is in line with the wider subthreshold PTSD literature than reviewed here and for which there is some consensus in the literature (Stein *et al.*, 1997; Schützwohl & Maerker, 1999; Marshal *et al.*, 2001; Blanchard *et al.*, 1994; Grubaugh *et al.*, 2005). Extant prevalence data would suggests that around five per cent of males and ten per cent of females in the general population develop PTSD in the USA with a lifetime prevalence rate of 7.8 per cent

(Kessler *et al.*, 1995; Ozer *et al.*, 2008). As noted above, as sPTSD rates are consistently shown to be similar or higher than PTSD, the finding has significant clinical implications.

The limitations associated with cross-sectional research applied to all reviewed studies bar Cukor *et al.* (2010) and Shelby, Golden-Kreutz & Anderson (2008). Similar methodological issues as outlined in previous studies (Cukor *et al.*, 2010) and discussed in the introduction were also found amongst the included articles, for example, a failure to report or control for lifetime prevalence of PTSD and comorbidities. This review can therefore not ascertain whether associated impairment reported was likely to be due to sPTSD symptoms rather than comorbid disorders such as depression or a combination thereof. Similarly, it was not clear if the sPTSD symptoms were remitting PTSD symptoms or if they were sub-clinical symptoms which had never reached threshold.

Other factors affecting the studies in this literature review are poor definition and measurement of the variables under investigation. There was no consensus on either the definition of sPTSD or functional impairment in the literature. A wide range of impairment measures were used across the published research with Breslau, Lucia & Davis (2004), amongst others, basing their empirical examination of associated impairment on four questions relating to impairment days experienced. Although these were reported to be standard economic and social impact questions, no validation or standardisation analysis of this measure was given. Furthermore, a wide range of PTSD measures were used including clinician interviews and self report measures. While clinician administered measures are considered more robust, only seven of the fifteen studies included such measures. As the current review is based on evidence using a wide on a range of methodologies and designs such heterogeneity is an intrinsic difficulty in drawing conclusions.

The concept of sPTSD is relatively widespread within the medical research setting to investigate psychological sequelae of different physical health and hospital related experiences. In a small review of this nature, it was surprising that two such studies met inclusion criteria. Taken together with emerging evidence from community studies that

sPTSD may be differentially related to different trauma types (Jeon *et al.*, 2007) this research sector may prove to be fruitful for review in the future. Similarly, alternate populations (e.g. military), outside the scope of this review, may shed more light regarding dysfunction associated with sPTSD.

As this review did not include foreign language studies and dissertations, important findings may have been missed. For example, after contacting Prof. Dr. Jacques Mylle to reduce publication bias, his dissertation which explicitly addressed subthreshold PTSD was only available in French. Similarly, a number of German studies were identified which may have met inclusion criteria. Another inherent difficulty with the present review was that the majority of sPTSD research focuses upon predictive variables without including formal functioning or impairment outcome measures. Many of the studies under review did not include ‘impairment’ as a primary focus, therefore the design of the studies were not optimised to investigate the degree of impairment associated with given PTSD symptomatology which was the focus of this systematic review.

As one of the objectives for this review was to evaluate available evidence for prevalence and impairment associated with sPTSD to inform service provision in the UK, it was surprising to find that no UK studies met inclusion criteria. When taking into account the wider search, a brief screen was done on all the full text article retrieved for the study (82) and only two UK studies were identified at this stage (Chung *et al.*, 2007a; Handley *et al.*, 2009). Although this may be indicative of a new and growing research area, it indicates a need to address this gap with suitable further research, rather than rely on extrapolations of findings from other countries for local service planning.

### **2.5.1 Strengths and Limitations of the Review**

The main limitations of the present review are the inherent difficulties in comparing a limited, and heterogeneous literature base. As a result, the review could not identify

conclusive evidence regarding the degree of impairment associated with sPTSD as this has been inconsistently measured in the studies reviewed here. The author of this review attempted to address potential publication bias by contacting all included authors and a number of additional researchers. In addition, the search was performed twice and crosschecked in an attempt to reduce error. Having two independent raters addressed potential subjective bias related to the reported quality of the included studies. The present review thus systematically identifies a significant gap in the understanding of impairment associated with sPTSD, especially in the UK. It summarises emerging evidence that categorical, diagnostic led planning of trauma service provision may neglect a subset of people who demonstrate clinically significant levels of impairment and may benefit from intervention. In addition, the review indicated that sPTSD may be at least as prevalent as PTSD and taken together with the impairment findings, this has important clinical implications for providing both appropriate care and for future service planning.

### ***2.5.2 Implications and Future Directions***

There is a need for well designed good quality research including longitudinal studies on the nature and course of sPTSD as compared to PTSD. In the first instance there may already be data on PTSD symptoms which did not reach diagnostic threshold available to address not only nosological issues, but shed light on associated levels of impairment. Revisiting such research will only take place if there is a consensus regarding the clinical relevance of sPTSD. Going forward, the research community needs to address methodological issues, especially controlling for comorbidity and an over-reliance on self report or non-standardised measures. In addition, a standardised definition of sPTSD may help to draw more meaningful, definitive comparisons with PTSD. A call for further research specifically designed to address associated impairment is also warranted as much of the current research focuses on predictors or correlates of PTSD.



In conclusion, subthreshold forms of PTSD may be associated with a degree of impairment which requires clinical intervention and may be more prevalent than full PTSD. Studies which found sPTSD groups were not associated with dysfunction may have lacked power as this was not reported. The higher quality studies, in terms of the review question, indicated a linear relationship between trauma symptoms and significant functional impairment, with PTSD identifying the most severely affected individuals. Additional research is required to establish associated impairment whilst controlling for comorbid disorders and lifetime prevalence of PTSD. In the UK there is a need for local research to inform trauma focussed care initiatives which are being considered.

#### **ACKNOWLEDGEMENTS**

The author is grateful to all the researchers who replied to the request for relevant unpublished literature, to the second reviewer Prof Kevin Power and to her thesis supervisor, Dr David Gillanders for his helpful comments.

#### **DECLARATION OF INTEREST**

None.

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## Chapter 3: Empirical Study

### 3.1 Introduction

Many people will experience one or more potentially traumatic events (PTEs) across a lifetime (Keane *et al.*, 2006; Kessler *et al.*, 1995). In a nationally representative sample in the United States of America (USA), the Kessler *et al.* (1995) study found that 60.7 per cent of men, and 51.2 per cent of woman, reported experiencing at least one PTE. Other epidemiological studies have found equally high or higher rates of exposure. For example, a Detroit based population study by Breslau, Lucia & Davis (1998) published an estimate of 89.6 per cent exposure to one or more traumatic events in their sample. Following such experiences, around 8 per cent of people develop psychopathology, most notably posttraumatic stress disorder (PTSD) and more than half of such PTSD cases show comorbid depression (Johnson, Maxwell & Galea, 2009).

Usually PTSD is diagnosed using a classification system such as the *International Statistical Classification of Diseases 10th edition* (ICD-10; World Health Organisation (WHO), 1993) or the *Diagnostic and Statistical Manual of Mental Disorders, 4th ed.* (DSM-IV; American Psychiatric Association (APA), 1994). The latter is more frequently used in PTSD research and requires that following exposure to a traumatic event there is threat to life or the experience of fear, helplessness or horror (criterion A). Three further symptom clusters define the disorder more specifically, namely:

- Re-experiencing (criterion B) e.g. intrusive memories, dreams of the event or flashbacks.
- Avoidance/numbing (criterion C) e.g. symptoms such as avoiding activities, places or employing efforts to avoid associated thoughts or feelings, as well as, feelings of detachment or estrangement.
- Hyperarousal (criterion D) e.g. startle reactions, difficulty sleeping or concentrating and poor control of anger.

Lastly, the DSM IV outlines two further criteria which relate to the duration of the symptoms (criterion E) and associated functional impairment (criterion F) respectively.

Extant prevalence data suggests that around 5 per cent of males and 10 per cent of females in the general population develop PTSD in the USA, with a lifetime prevalence rate of 7.8 per cent (Kessler *et al.*, 1995; Ozer *et al.*, 2008). More recently there is a widening debate on subthreshold forms of PTSD (sPTSD) as there is evidence that symptoms which do not reach threshold may still be associated with clinically significant impairment (Cukor *et al.*, 2010). This has been as outlined by the systematic review in the previous chapter.

There is a relatively large amount of research in the PTSD literature on the risk factors and socio-demographic correlates associated with developing the disorder (see Brewin *et al.*, 2000 and Ozer *et al.*, 2008 for meta-analyses on risk factors and predictors of PTSD respectively). In addition, research communities have often focussed (rightly so) on the effectiveness of psychological interventions for PTSD and again, a number of systematic reviews and meta-analyses have been published in this regard (Bradley *et al.*, 2005; Bisson & Andrew, 2007; Benish, Imel & Wampold, 2008). The effects of trauma are varied and known risk factors can be outlined in terms of three main domains: personal variables including individual vulnerability and specific reactions during the event, characteristics of the event, and the support available to the individual at the time of the event and beyond (Briere & Scott, 2006). A full discussion of these areas, are out-with the scope of this thesis, however important factors are briefly summarised below.

Research has shown a number of personal variables are related to trauma symptomatology and have been well studied (Brewin *et al.*, 2000; Ozer *et al.*, 2008):

- Female gender
- Age, younger age and older age is associated with a greater risk
- Lower socio-economic status
- Ethnicity, with minority status groups at greater risk
- Psychiatric history
- Previous history of trauma

- Family dysfunction and/or psychiatric history
- Perceived life threat
- Peritraumatic emotional response
- Peritraumatic dissociation
- Neurobiological consequences

Characteristics of the trauma have also been shown to be important in post-traumatic outcome. Such features include, intentional acts of violence versus non-intentional, the presence of life threat, physical injury, sexual assault and witnessing death or experiencing the loss of a loved one in the traumatic event (Briere & Scott, 2006). Finally, there is evidence to suggest that social support before, during and after the event is an important factor associated with psychological outcome following trauma (Brewin *et al.*, 2000).

It is important to recognise that these variables are not independent of each other and true causal links of the psychophysiological effects of trauma exposure are not fully understood. In addition, trauma symptoms and PTSD are highly comorbid with other psychiatric problems such as major depressive disorder, anxiety disorders other than PTSD and substance misuse problems (Jacobsen, Southwick & Kosten, 2001). For instance, rates of comorbidity of psychiatric disorders for women with PTSD have been reported as between 70 to 80 per cent by two prominent epidemiological studies (Kessler *et al.*, 1995; Creamer *et al.*, 2001). The relationship between PTSD and comorbid disorders is not clear, that is, is PTSD primary or secondary to other conditions such as depression or substance misuse? It has been shown that in the majority of cases, depression and substance misuse problems are secondary to PTSD whilst this is so for around half of comorbid anxiety problems (Kessler *et al.*, 1995). In addition, Blanchard *et al.* (2003) have shown that treatment of PTSD reduces comorbid depression.

A number of models have been put forward to explain the aetiology and development of PTSD which form the theoretical basis of psychological treatments for the disorder.

From early classical conditioning and learning theories, which can account for the development and maintenance of fear or avoidance symptoms but which lack explanatory power for intrusion symptoms, to a number of social-cognitive models by researchers such as Foa *et al.* (1989), Shapiro (1995) and Ehlers & Clark (2000) to name but a few. Brewin, Dalgleish & Joseph (1996) proposed an influential Dual Representation Model which incorporated both information processing and cognitive theories (Resick & Calhoun, 2001) and with recent advances in neuroimaging techniques, neurobiological models are being put forward to explain aspects of PTSD such as dissociation and memory integration (Brewin, 2008). However, the cognitive model of PTSD is one of the most pervasive models and forms part of cognitive behavioural therapy (CBT) approaches to PTSD and those which have incorporated a neurobiological understanding of trauma processing such as Eye Movement Desensitisation and Reprocessing (EMDR; Shapiro, 1995 & 2001).

In brief, this model proposes that through learning experience anxiety symptoms arise due to the negative appraisal of impending threat. It is hypothesised that PTSD develops in those individuals who process the traumatic event and its consequences, in a way which activates a persistent sense of threat. Behavioural and cognitive strategies, most notably avoidance, are employed to control this threat and are proposed to maintain PTSD symptoms. Maintenance cycles are thought to be due to the reinforcement of avoidance behaviours by the short term distress reduction which they provide. This in turn leads to a failure to disconfirm or emotionally process the misinterpreted threat appraisals (Ehlers *et al.*, 2005). A distinguishing feature of some PTSD presentations is numbing which is proposed to be a form of emotional escape used when avoidance strategies do not work or are not available (Foa *et al.*, 1995). Other trauma symptoms of re-experiencing and hyperarousal are thought to maintain the sense of current threat. These trauma symptoms of re-experiencing, avoidance or numbing and hyperarousal are in turn linked to the individual's belief about the trauma and its sequelae (Ehlers & Clark, 2000). Traditionally, CBT approaches (as well as other successful PTSD interventions) are based on exposure techniques which directly address avoidance and therefore influence information processing of the trauma memories. Cognitive strategies are used alongside exposure to modify negative

appraisals and beliefs about the event and the interested reader can refer to Elhers & Clark (2000) for an in-depth review of the model.

Although there is encouraging empirical evidence for CBT treatments as outlined in a number of meta-analyses (e.g. Bradley *et al.*, 2005) and a Cochrane review (Bisson & Andrew, 2007), their superiority over therapies such as stress inoculation training (Rothbaum *et al.*, 2000) supportive counselling (Foa *et al.*, 1991) and relaxation (Marks *et al.*, 1998) remains inconclusive. Furthermore, when behavioural exposure interventions are directly compared to cognitive therapy components, there is no consensus on whether one enhances the other, or that together they offer a superior treatment (Mendes *et al.*, 2008). The specific effects of CBT are therefore still not well understood (i.e. the specific relationships between the theoretical components of CBT have not been clarified in the empirical literature). A further issue highlighted by the meta-analyses done to date, is that there are higher withdrawal rates in the CBT treatment arms, compared to the treatment as usual (TAU) part of the trials. This is suggestive that such treatments are not acceptable to some individuals (Mendes *et al.*, 2008). Lastly, a proportion of people who develop PTSD do not respond to CBT based psychotherapy or only show minimal improvement. For example, a systematic review by Bradley *et al.* (2005) reported that across 26 trials from 1980 to 2003, clinically meaningful improvement rates among treatment completers for exposure therapy, cognitive therapy, CBT and EMDR combined was 44 per cent, whilst 67 per cent no longer met PTSD criteria post treatment. Therefore, in this study there was no significant change for more than half of the people across the trials and at least a third of the individuals still met the diagnostic criteria for PTSD. For this, and the reasons discussed above, there is a clear need for research to address which therapeutic components are most effective in order to refine existing treatment approaches or develop additional ones. One way of doing this is through a focus on investigating the mediating psychological processes of mental disorder (Kinderman, Sellwood & Tai, 2008). Recently, there is a growing interest in CBT approaches which have started to employ mediation and component analysis. Some of these approaches are part of what has been termed 'third wave' cognitive behaviour therapies and include approaches based on mindfulness e.g. Mindfulness Based Cognitive Behaviour Therapy (MCBT;

Segal, Williams & Teasdale, 2002), Mindfulness Based Stress Reduction, (MBSR; Kabat-Zinn, 1990) and more integrative approaches such as, Dialectical Behaviour Therapy (DBT: Linehan, 1993) and Acceptance and Commitment Therapy (ACT; Hayes, Strosahl & Wilson, 1999).

These more recent developments in CBT have seen theoretical explanations of psychopathology which emphasise the role, context and function of different psychological processes (Hayes *et al.*, 2011). One such approach is ACT which attempts to provide a coherent understanding of the underlying process which leads to human behaviour. The ACT perspective is that there are a number of underlying behavioural processes which contribute to psychological inflexibility, which exacerbates and maintains psychopathology. The drive to measure symptom reduction and explain psychological problems in mechanistic ways, rather than focus on the impact such problems may have on quality of life, is thought to be a limitation in our current understanding of psychological disorders (Batten & Hayes, 2005).

The ACT model suggests that engagement in experiential avoidance strategies to control or alter private internal experiences underlies many forms of psychopathology and therefore addresses some of the complexities of disorders such as PTSD simultaneously rather than breaking them down into cognitive or behavioural parts and researching such psychological constructs separately. ACT is a behaviour therapy developed from a coherent theoretical framework based on Relational Frame Theory (RFT). In brief, RFT is a psychological account of how human language and cognition is related to behaviour and incorporates a philosophical view called functional contextualism (Hayes *et al.*, 1999; Hayes 2004). The main theoretical implication of RFT for psychopathology is that human cognition is a specific kind of learned behaviour which is contextually controlled. Healthy psychological functioning is seen to be related to an individual's ability to respond to changing environmental contingencies in an adaptive way (Hayes *et al.*, 2006). Verbal learning processes such as reasoning and verbal problem solving can be applied to cognition but when such processes are rigid or inflexible, psychopathology may develop. The theoretical

framework of RFT and ACT philosophy is out-with the scope of this thesis; see Hayes, Barnes-Holmes & Roche (2001) for a full review.

The empirical evidence for the ACT theoretical model and ACT interventions is growing. An independent meta-analysis reported that ACT was superior to treatment as usual with an effect size (*ES*) of .42 as well as superior to wait-list control or psychological placebo (*ES* of .68). ACT was however not significantly more effective than established treatments such as CBT with an *ES* of .18 ( $p = .13$ ) reported previously (Powers, Vording & Emmelkamp, 2009). More recently, the empirical evidence has been summarised in terms of the correlational, experimental, process, outcome and case studies published to date by Ruiz (2010). In summary, the outcome evidence suggests ACT based protocols are more efficacious than other control-based protocols across a number of psychological problems including depression, mixed anxiety/depression, obsessive compulsive disorder, other anxiety disorders such as generalised anxiety disorder and social phobia. There is also limited evidence for its efficacy in treating psychotic disorders and borderline personality disorder (Ruiz, 2010). However, the evidence for the efficacy of ACT interventions, as well as how novel this approach is in comparison to CBT, is critically addressed by a number of researchers. In terms of design flaws, many studies are reported to rely on wait list controls or treatment as usual groups as their main comparison, rather than on other established treatments (Öst, 2008). Methodological variables such as number of therapists, validity of outcome measures and reliability of diagnosis in question were often significantly poorer than equivalent CBT studies using a methodological rating scale (Öst, 2008). In terms of theoretical differences, Arch & Craske (2008) and Hoffman & Asmundson (2008) have outlined a number of similarities, despite the fact the CBT and ACT are based on different philosophical foundations and conclude that the approaches are not incompatible. These methodological critiques have been welcomed in the ACT literature and many of the proposed differences continue to be actively researched and debated (Gaudiano, 2009; Hayes *et al.*, 2011). The process research is described as indicating that much of the theoretical model is coherent and a number of limitations or directions are outlined by Hayes *et al.*, (2010).



Clinically and theoretically, ACT proposes that it is not necessarily the beliefs about the event which cause a person psychological distress and lead to behaviours which maintain difficulties. Rather, that there are a number of behavioural processes or ways of treating these beliefs which mediate such relationships and pathological states are often based on control or avoidance strategies. These processes describe ways of responding to contextual cues which if adaptive, or are employed in order to pursue valued goals, is termed psychological flexibility (Hayes *et al.*, 2006). There is a shift away from trying to change the content or form of thoughts and beliefs as in some cognitive approaches, to addressing the function and context in which they arise and how individuals respond to the presence of unwanted thoughts, beliefs and distress. The aim of ACT interventions therefore is not to change beliefs (as in the cognitive approach of restructuring) but to influence the relationship a person has to their internal experiences by affecting the way in which people respond to contextual cues. One such behavioural process is termed cognitive fusion. Cognitive fusion is a normal process which is highly adaptive if employed flexibly. However, when there is a tendency to excessively structure internal experiences verbally and this process becomes over learned, such strategies may be used in contexts where such a response is unhelpful and regulate behaviour in non adaptive ways (Wilson & DuFrene, 2009). In a pathological form, cognitive fusion has been defined as "*the tendency of human beings to live in a world excessively structured by literal language*" (Strosahl *et al.*, 2004, p. 39). For example, after experiencing a trauma, if a person is fused with thoughts such as "I am damaged" or "I am a bad person" the emotional salience is such that these thoughts feel true. If they are treated literally, a person may struggle with (or become fused with) these personal cognitive events in such a way that they dominate their behaviour (Luoma & Hayes, 2009). They may try to get temporary relief through various control based strategies such as escaping through drug and alcohol use, or be unwilling to form relationships due to being fused with the belief that they are bad.

Cognitive fusion promotes another behavioural process implicated in psychopathology and which has been more widely researched in both the ACT and CBT traditions. This is concept of 'experiential avoidance'. In the ACT approach, experiential avoidance is the tendency to escape from unpleasant inner experiences such as emotions, and use

control based strategies of avoidance for temporary relief from upsetting symptoms. Hayes *et al.* (2004), p. 27 define this as "*the attempt to escape or avoid the form, frequency, or situational sensitivity of private events, even when the attempt to do so causes psychological harm*".

In addition to fusion and avoidance, there are a further four overlapping processes in the ACT model which are thought to lead to psychological inflexibility and underlie psychopathology, namely, loss of contact with the present, adopting a narrow conceptually defined view of the self, lack of clarity of important values and inaction. As a way of simplifying the current study, the thesis has sought to capture the important dimensions of avoidance, fusion and behaviour regulation in the form of valued action or living consistently with personal values in a clinical population whilst choosing not to the study remaining mindfulness and self processes. (See Hayes *et al.* (2004) for a discussion of the ACT model.)

With regard to trauma, the ACT model proposes that struggling with personal events (cognitive fusion) and trauma symptoms of avoidance of difficult private experiences (experiential avoidance) will have a negative impact on behaviour (valued action) which in turn influences psychological outcome (trauma symptoms). Empirical support for the use of ACT in PTSD is limited and research into theoretical correlates and functional relationships that ACT postulates is warranted to support this development (Batten & Hayes, 2005). There have been a number of studies which have investigated the role of experiential avoidance in psychological functioning post event (Plumb, Orsillo & Luterek, 2004) or adult survivors of childhood sexual abuse (Marx & Sloan, 2002). Such studies have found that experiential avoidance mediates the relationship between trauma history and psychological distress. No published studies to date have investigated the role of cognitive fusion in post event functioning in a primary care psychology service in this way and this therefore forms a main part of the empirical study of the thesis.

As discussed in the introduction, in Scotland and the rest of the United Kingdom (UK), little information exists on the prevalence rates of trauma history or PTSD. To the best

of the author's knowledge there are no peer reviewed research papers estimating the extent of trauma history and PTSD symptoms (threshold or subthreshold) presenting in primary care psychology services in Scottish samples, nor is there up to date epidemiological research on PTSD in the UK. As there is currently little local or national data available about the prevalence, correlates or determinants of trauma symptoms and PTSD in a clinical population, clinicians, government and researchers must rely on epidemiological studies from the USA to make inferences about prevalence and plan services accordingly. This has clear clinical and economic implications.

### **3.2 Aims of the research**

Given the lack of prevalence information in psychological services and Scotland, as well as the need to refine and/or develop more suitable treatments for PTSD of which ACT is showing some promise, the aims of the current study are twofold: The first part of the study aims to investigate how many people attending psychology services have experienced a traumatic event and present with trauma symptoms. The second part of this study aims to explore possible processes, which predict or mediate trauma related outcomes following exposure to one or more potentially traumatic events in a clinical population. These include theoretical postulations from the emerging ACT literature on PTSD as outlined above.

#### **3.2.1 Hypothesis 1**

How is trauma history related to psychological distress at initial assessment in the sample? Specifically, it is hypothesised that the number of traumatic life experiences a person experiences will be positively correlated with higher psychological distress at initial assessment.

### **3.2.2 Hypothesis 2**

What is the relationship between cognitive fusion, experiential avoidance, not living in accordance with identified values and trauma symptomatology? Specifically, it was hypothesised that cognitive fusion, experiential avoidance and living less consistently with important values would be related to trauma symptom severity.

### **3.2.3 Hypothesis 3**

Does cognitive fusion and/or experiential avoidance mediate the relationship between the number of traumatic experiences (trauma history) and trauma symptoms severity?

### **3.2.4 Hypothesis 4**

What is the relationship between all the ACT variables in the sample? Does fusion and/or experiential avoidance mediate the relationship between the number of traumatic experiences (trauma history) and consistency of valued living?

## **3.3 Methodology**

### **3.3.1 Design**

This study was a quantitative cross sectional design with participants completing a pack of questionnaires on a one-off basis. In addition, clinicians from the recruiting services were required to complete demographic information and report the outcome of a general psychological distress measure patients are required to complete at initial assessment. The research employed a mixed statistical methodology. The first part of the study used descriptive statistics to investigate the prevalence of trauma history and PTSD symptoms in the sample along with degree of psychological distress at initial

assessment. The second part of the study focused on the group with a history of trauma. Initial analysis was conducted to establish the strength of association between the variables through correlation analysis, testing hypotheses 1 and 2 above. To explore further what the relationships were between the variables, mediation analysis was employed. This allowed for the relative strengths of the correlations amongst a directed set of the variables to be tested and addressed hypotheses 3 and 4 outlined in the previous section.

### **3.3.2 Ethical considerations**

#### **3.3.2.1 Ethical approval**

The Tayside Committee on Medical Research Ethics and the Tayside Academic Health Sciences Centre Research and Development Office approved the present study (see Appendix 4 and 5 respectively). The proposal was also approved by the University of Edinburgh's Section of Clinical and Health Psychology Research Viability and Ethics process as a viable project. The Tayside Committee on Medical Research Ethics Committee asked for clarification on three areas of the initial application form and made further recommendations regarding alterations to the participant information sheet (PIS) and consent form. These recommendations included, considering an opt-in slip, changing the data protection paragraph on the PIS to a standardised statement and changing the title wording on the consent form. The correspondence in this regard has also been included in Appendix 6.

#### **3.3.2.2 Main ethical considerations**

During the planning of the project and the research process there were a number of ethical issues that merited consideration. Firstly, the main concern was that the study had the potential to evoke a degree of distress as participants were asked to complete a questionnaire about traumatic experiences. The possibility of eliciting difficult emotions was highlighted in the PIS. Furthermore, this was managed by having the

questionnaires administered by experienced clinicians, recruiting people with whom they were in a supportive therapeutic relationship. This meant that throughout participation an experienced clinician was on hand to offer support, provide information or treat any presenting problems.

A further concern was that there may be an element of coercion by clinicians in order to support the present study and obtain valuable service information. However, clinicians working in psychological services are trained and experienced in providing information regarding treatment and taking informed consent without coercion as this affects the therapeutic relationship which is central to the delivery of psychological treatments. At the centre of this process is patient autonomy and choice and coercion is professionally unacceptable. This was further addressed by providing a clinician guideline outlining the study and they were expected to reiterate that participation (or non-participation) was entirely voluntary and would not affect care. If patients felt coerced at any stage of the process they were provided with information to lodge a complaint as per the NHS complaints procedure outlined in the PIS.

### **3.3.3 *Participants***

#### **3.3.3.1 Recruitment**

Potential participants were identified by their allocated psychologist within an Adult Primary Care Psychology Service in the National Health Service (NHS) in Scotland. The service provides care for a mix of metropolitan and rural areas. Clinicians were asked to invite all patients on their caseload with whom they had built up a therapeutic relationship. No new assessment cases or end of treatment cases were eligible for the study due to the nature of one of the questionnaires and the ethical considerations of the project. Inclusion and exclusion criteria matched those of the Primary Care Service which included individuals in the age range of 18 to 64 years with a diagnosis of mild to moderate psychological disorder which is likely to respond to a time limited period of psychological treatment. For example, anxiety disorders including PTSD and obsessive

compulsive disorder (OCD), mild to moderate depressive disorders and bulimia with no physical complications. Patients with presenting problems which did not match primary care psychology criteria including known current drug or alcohol problems, known organic pathology such as traumatic brain injury or dementia, learning disability, anorexia nervosa or severe and enduring mental illness such as schizophrenia, bi-polar or personality disorder, were not included. In addition, non English speaking patients were not eligible.

### **3.3.3.2 Sample size and Power Calculations**

The statistical power of a test is the ability to detect an effect in a sample if there is one. Power calculations were conducted *a priori* to determine the minimum sample size necessary to achieve a certain level of power given an estimated effect size and significance  $\alpha$ -level which is conventionally set at  $p < .05$ .

Cohen (1992) outlines the importance of power analysis in behavioural science research and suggests the following conventions to calculate sample size. Firstly, such research should use an alpha level ( $\alpha$ ) of .05 probability of failing to detect a genuine effect. This is known as Type I error, which is the chance of mistakenly rejecting the null hypothesis i.e. that there is no relationship between the phenomena or variables being investigated. Secondly, to use what is termed power of at least .80 which is a beta ( $\beta$ ) level set at .20 (as power =  $1 - \beta$ ). This is the risk of making a Type II error and concluding there is no effect when there actually is one. Lastly, research should have a notion of the degree to which the null hypothesis is believed to be false as guided by effect sizes ( $ES$ ) of previous outcomes with the variable under investigation.

Previous research had shown that one of the present study's primary measures, the Acceptance and Action Questionnaire (AAQ), typically showed moderate strength correlations of  $r = .31$  to  $.37$  with measures of PTSD (Plumb, Orsillo & Luterek, 2004; Hayes *et al.*, 2004; Gold *et al.*, 2005). Furthermore, in a series of validation studies, the other primary independent variable, the Cognitive Fusion Questionnaire (CFQ),

correlated strongly with psychological distress, as measured by the CORE ( $r = .59$ , Gillanders *et al.*, 2010). On this basis, the study expected to be able to find moderate to strong correlations between the independent and dependant variables.

In order to have 80 per cent power to detect moderate strength effects or larger at an alpha level of .05, Cohen (1992) recommends that a sample size of 76 people would be required to enter a regression analysis with three predictor variables and one dependant variable. Furthermore, Green (1991) gives a formula of  $50 + 8m$  to detect moderate or larger effects within a regression analysis, at the same alpha and beta levels, where  $m$  equals the number of predictor variables. Following this formula, a similar sample size of 74 is required for three independent variables and one dependent variable.

More recently, resampling methods that do not rely on parametric assumptions are being put forward as the most useful option for testing effects in simple mediation models (Preacher & Hayes, 2004; Hayes, 2009). Bootstrapping is one such method which does not have a specific sample size requirement. However, the larger the sample, the more reliable the confidence intervals generated by the method becomes. For the mediation analysis, bootstrapping was used (see statistical analysis section below).

The study aimed to recruit around 80 participants on the basis of the above recommendations to have adequate power to investigate up to three independent variables in a regression analysis (mediation model).

### **3.3.4 Measures**

#### **3.3.4.1 Posttraumatic Stress Diagnostic Scale**

The Posttraumatic Stress Diagnostic Scale (PDS: Foa, 1995) is a 49 item, self report questionnaire, which identifies exposure to potentially traumatic events and assesses symptom severity in terms of DSM IV criteria for post traumatic stress disorder. This is



a widely used measure with good psychometric properties including high internal consistency of an alpha coefficient of .92 with highly significant test-retest correlation of symptom severity of  $r = 0.83$  (Foa *et al.*, 1997). This measure is reported to have a diagnostic agreement of 82 per cent with another widely used clinician administered interview called the Structured Clinical Interview for DSM IV (SCID: Spitzer, 1992) and along with the Clinician Administered PTSD Scale (CAPS; Blake *et al.*, 1995) is considered the gold standard in the diagnosis of PTSD (Litz *et al.*, 2002). In addition, the PDS has psychometric data based on a psychiatric outpatient sample (Sheeran & Zimmerman, 2002) and it has demonstrated good overall efficiency of 88 per cent where efficiency is defined as the percentage of respondents correctly classified as having PTSD (Brewin, 2005). There are a four parts to the questionnaire, using either yes/no responses, or a four point likert-type scale. The instrument produces a symptom severity score and an associated rating of PTSD symptoms which are 'No rating', 'Mild', 'Moderate', 'Moderate to Severe' and 'Severe'. Similarly, a level of functional impairment is calculated from 'No Impairment', 'Mild', 'Moderate' through to 'Severe'. The number of symptoms in each of the DSM IV Symptom clusters B, C, and D is calculated, as well as the total number of symptoms. Copies of the questionnaires are included in Appendix 7.

#### **3.3.4.2 Cognitive Fusion Questionnaire**

The Cognitive Fusion Questionnaire (CFQ13; Gillanders *et al.*, 2010) is a brief self report measure of 13 questions. It was developed to measure the main dimensions of cognitive fusion including, believability, entanglement, taking action contrary to thoughts and perspective taking. The CFQ 13 has been shown to have good reliability, with a Cronbach's alpha of 0.89 for the fusion scale across four separate community samples. Preliminary results in clinical samples have also shown good reliability. Convergent validity on related constructs such as distress, mindfulness, thought control strategies and life satisfaction has been well established via correlation analysis with standardised measures of these constructs. The CFQ 13 measure takes less than five minutes to complete and asks participants to rate a list of statements according to how

true each statement is for them on a seven point likert-type scale from 'never true' through to 'always true'. A higher score on this measure indicates greater levels of cognitive fusion.

#### **3.3.4.3 Acceptance and Action Questionnaire**

The Acceptance and Action Questionnaire II (AAQ II; Bond *et al.*, in press) is a seven item measure of experiential avoidance which aims to evaluate a person's ability to be present with thoughts and feelings as they arise without needless avoidance or deliberate attempts to change the form or frequency of these events. The AAQ II has demonstrated good construct validity of alpha ranging between .78 and .88 across different samples with an average of .84 overall. This measure has also demonstrated good construct validity through various convergent, predictive and discriminate validity studies with other standardised or well validated measures such as the Beck Depression Inventory II (BDI-II; Beck, Steer & Brown, 1996), Beck Anxiety Inventory (BAI; Beck & Steer, 1990), the White Bear Suppression Inventory (WBSI; Wegner & Zanalos, 1994) and the Global Severity Index of the Symptom Checklist 90- Revised (SCL-90-R-GSI; DeRogatis, 1992). In addition, test-retest reliability is reported as .81 for three months, and .79 at 12 months, respectively. The items are rated on a seven point likert-type scale and this is a one factor measure where higher scores indicate greater levels of experiential avoidance.

#### **3.3.4.4 Valued Living Questionnaire**

The Valued Living Questionnaire (VLQ; Wilson *et al.*, 2010) is a two part instrument consisting of ten items in each part. The measure assesses valued action, which examines how consistently a person reports living with their identified important values. In part one, the participants rate the importance of ten domains of living on a ten point likert-type scale. Examples of these domains are family, parenting, intimate relationships, recreation and physical well being. In part two, the participant is asked to rate how consistent their actions have been over the past week in relation to these ten

domains using the same scale. The reliability for the importance and consistency subscales is reported as good, with a Cronbach's alpha of .77 and .75 respectively (Wilson *et al.*, 2010). In addition, Wilson *et al.* (2010) demonstrated that construct validity has been adequately confirmed by factor analysis.

#### **3.3.4.5 Clinical Outcomes in Routine Evaluation**

The Clinical Outcomes in Routine Evaluation Outcome Measure (CORE-OM; Evans, 2000) is a client self-report questionnaire that evaluates a broad range of psychological problems and measures global distress. It is routinely used as an outcome measure in psychology services. It has 34 items which cover four dimensions including, subjective well being, commonly experienced problems or symptoms, life/social functioning and risk. The instrument has been validated in a number of populations including the general population, NHS primary and secondary care, and in older adults. Psychometric properties for this scale are reported as good, with internal consistency ranging from an alpha of .75 to .95 across all domains and good test retest stability of 0.87 - 0.91 on the non risk dimensions (Evans, 2002). The stability of the risk domain is reported as .64 which is to be expected due to the reactive and situational nature of the items making up the dimension. In addition, the measure shows good convergent validity with other standardised measures (Evans, 2002). Statements are rated using a five point scale to identify how participants have felt over the past week. In the current study, the services taking part administer the CORE-OM (referred to as CORE henceforth) at initial assessment and on completion of treatment. The pre treatment CORE scores were used in the present research and collected as part of the demographic information covering page described below.

#### **3.3.4.6 Demographic information**

Demographic information was collected via a covering page completed by the participant's psychologist or the researcher, so that participants did not have to repeat this information on each questionnaire. The covering page captured information

consisting of; age, gender, post code, clinician rated diagnosis and CORE scores obtained during initial assessment (see Appendix 8 for a copy of the demographic page used). The post codes of participants were obtained in order to identify the associated deprivation index as per the Scottish Index of Multiple Deprivation (SIMD; Scottish Government, 2009).

### **3.3.5 Procedure**

Clinicians working in the adult psychological therapies service invited all ongoing treatment cases to take part in the study by means of a participant information sheet (PIS) with an opt-in slip, that was provided at a scheduled appointment, copies of which are included in Appendix 9 and 10 respectively. Potential participants were asked to opt-in at their next appointment or contact the researcher directly to schedule a time to complete the questionnaire pack. All clinicians were given a clinician guideline outlining the procedure to ensure as much consistency as possible (see Appendix 11). The procedure is detailed below:

- After reading the PIS a participant opted into the study via returning the opt-in slip.
- Participant's typically had one or two weeks to consider taking part.
- A time for participation was arranged along with the participant.
- An experienced clinician took informed consent.
- Completion of the questionnaire pack with a clinician supporting the participant if required.
- The questionnaire pack included the CFQ 13, AAQ II, VLQ, PDS & Demographic information including pre-treatment CORE scores form.
- Following completion of the pack which on average took less than 20 minutes, participation was complete.
- If participants had indicated that they would like information on the outcome of the study a brief summary would be sent or emailed as per the participant's preference indicated during consent taking.

Questionnaire packs were returned to the researcher in a sealed, pre-addressed envelope by clinicians, or participants could hand in the envelope at the reception desk themselves.

### **3.3.6 Statistical analysis**

Data from questionnaires were entered into a statistical package called Predictive Analytics SoftWare (PASW) previously known as Statistical Package for the Social Sciences (SPSS) version 18.0 for windows.

A missing values and parametric assumptions analyses was conducted for all variables that would be investigated. For the first part, descriptive statistics were used for the socio-demographic and prevalence of trauma history factors in the sample. Pearson's correlations were used to investigate the associations between trauma history and level of psychological distress at initial assessment. In addition, correlations of sociodemographic variables were performed with all dependent variables to assess if they were potential covariates in the hypothesised associations.

In the second part, correlations were conducted to investigate the overall associations between cognitive fusion, experiential avoidance, valued action, and trauma symptoms severity. This was followed by simple mediation and multiple mediator analyses using the resampling technique of bootstrapping to perform the multiple regression and explore the statistical influences amongst a directed set of variables. This allowed for analyses of the statistical effect of cognitive fusion and experiential avoidance as possible mediators or indirect effects between trauma history and trauma outcome.

## 3.4 Results

### 3.4.1 Extent of trauma history and symptoms

#### 3.4.1.1 Descriptive analyses

Twenty two clinicians across three primary care psychology sites in Tayside invited 119 patients to take part in the study. Thirty four patients declined and three agreed to take part but did not attend their allocated appointment representing a response rate of 69 per cent. In total, 82 participants were recruited. The age range of participants was 17 to 64 with a mean age of 37.8 years ( $SD = 12.5$ ). Seventy per cent of the sample were female ( $N = 57$ ) and all participants were Caucasian. The sample was drawn from three local authorities, their representations of which are outlined in Table below.

*Table 6: Number and percentage of participants from each local authority*

	N	%
Angus	20	24.4
Dundee City	53	64.6
Perth & Kinross	9	11

##### 3.4.1.1.1 Prevalence of trauma history in the sample

Eighty nine per cent of participants presented with a history of trauma ( $N = 73$ ). There was no significant differences between gender in terms of prevalence, with 88 per cent of the males ( $N = 22$ ), and 89.5 percent of females ( $N = 51$ ) in the sample reporting a history of trauma. Of those presenting with a trauma history, 22 per cent reported exposure to one traumatic event whilst 67 per cent reported exposure to multiple traumatic events. Figure 2 outlines the number of traumatic events endorsed by the whole sample. The mean number of distinct events was 2.62 ( $SE = .20$ ) the average

number of events being slightly lower for men (2.28,  $SE = .30$ ) than women (2.77,  $SE = .25$ ).

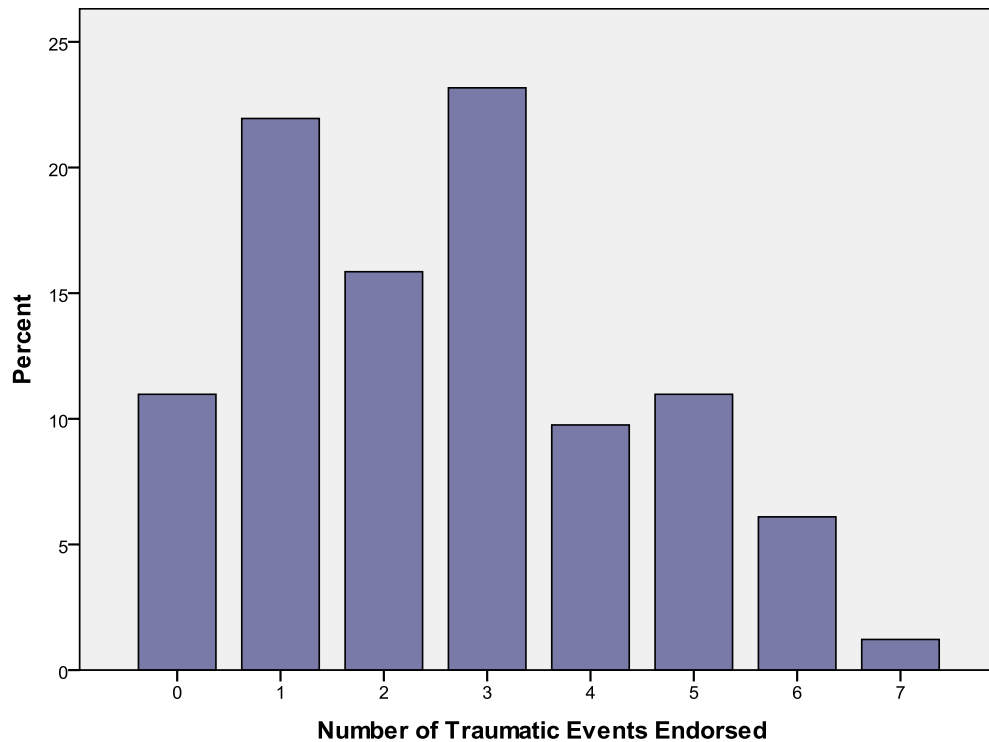


Figure 2: Number of traumatic events endorsed in the sample

Table 7 outlines the trauma types and percentage of traumatic experiences endorsed by gender in the population studied. Overall, the most frequently endorsed event was life threatening illness (self or other) or the sudden death of another person followed by sexual contact with a person who was five years or more older than the person when they were under the age of 18 and then non sexual assault by a stranger. However, when splitting this by gender, the third most frequent event for females was sexual assault by a family member or someone known to them. For males the most common event was non-sexual assault by a stranger, followed by life threatening illness or sudden death and then serious accident, fire or explosion.

*Table 7: Percentage of total sample endorsing various traumatic events and this percentage split by gender*

	Total		Male		Female	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Serious accident, fire, or explosion	24	29.3	9	36	15	26.3
Natural disaster	3	3.7	1	4	2	3.5
Non-sexual assault by family or someone known	27	32.9	7	28	20	35.1
Non-sexual assault by a stranger	29	35.4	14	56	15	26.3
Sexual assault by family or someone known	26	31.7	2	8	24	42.1
Sexual assault by a stranger	7	8.5	1	4	6	10.5
Military combat or a war zone	3	3.7	2	8	1	1.8
Child Sexual Contact with person 5+ years older	32	39	5	20	27	47.4
Imprisonment	1	1.2	1	4	0	0
Torture	7	8.5	0	0	7	12.3
Life-threatening illness/sudden death	40	48.8	11	44	29	50.9
Other traumatic event	16	19.5	4	16	12	21.1

Figure 3 reports the events that were rated as the most traumatic. The events identified as most upsetting for females were sexual assault by a family member or known person ( $N = 17, 33\%$ ), followed by life threatening illness or sudden death ( $N = 16, 31\%$ ) and non-sexual assault by family or someone known ( $N = 6, 12\%$ ). For males the most upsetting event reported was life threatening illness or sudden death ( $N = 8, 36\%$ ) followed by non-sexual assault by a stranger ( $N = 6, 27\%$ ) and then serious accident, fire or explosion ( $N = 4, 18\%$ ).



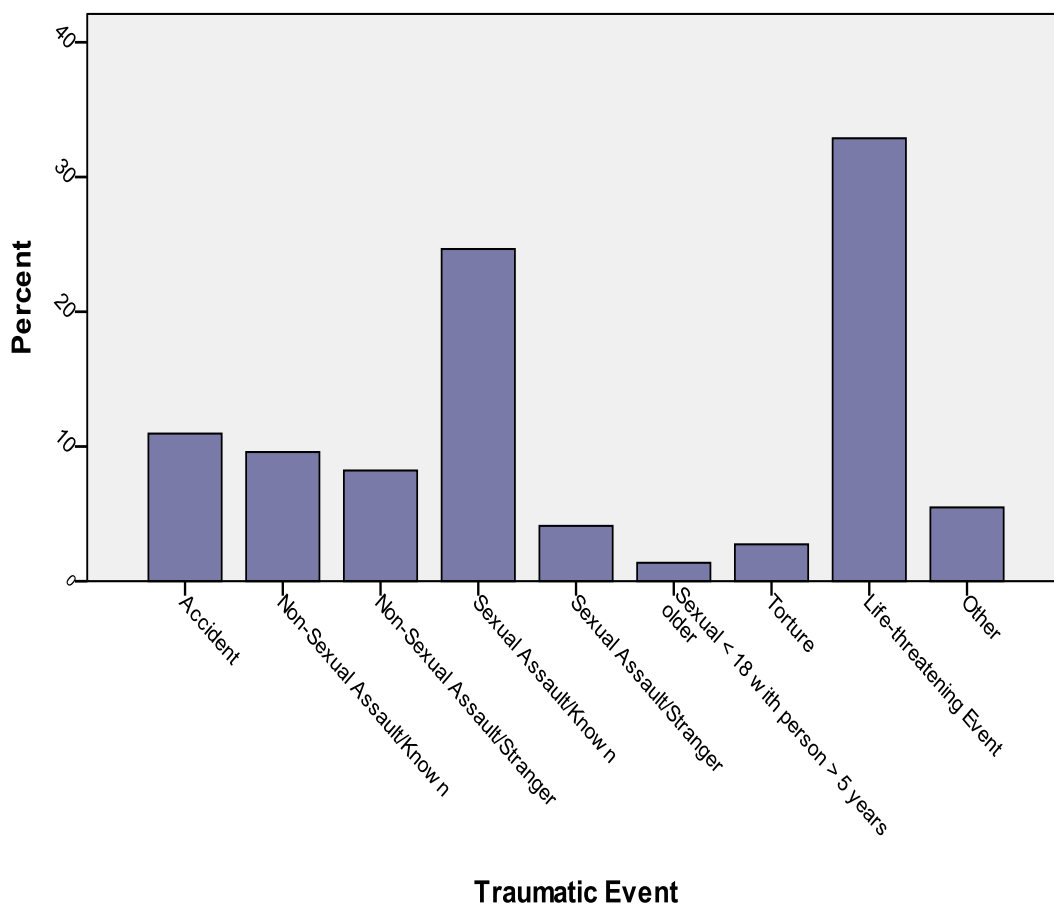


Figure 3: Percentage of sample endorsing various traumatic events as the most upsetting

#### **3.4.1.1.2 Socioeconomic status**

The Scottish Index of Multiple Deprivation (SIMD) decile point scale was used to evaluate the role of socioeconomic status as a possible covariate as this is an established predictor of PTSD (Brewin *et al.*, 2000). The SIMD is an index that rates socio-economic status along multiple indicators on a scale of 1 to 10, with 1 indicating greatest deprivation in Scottish communities (Scottish Government, 2009). In the overall sample, 56 per cent of participants lived in the five most deprived SIMD areas

with a reasonably equal distribution across all levels in the sample (see Figure 4 for a graphical representation of the distribution).

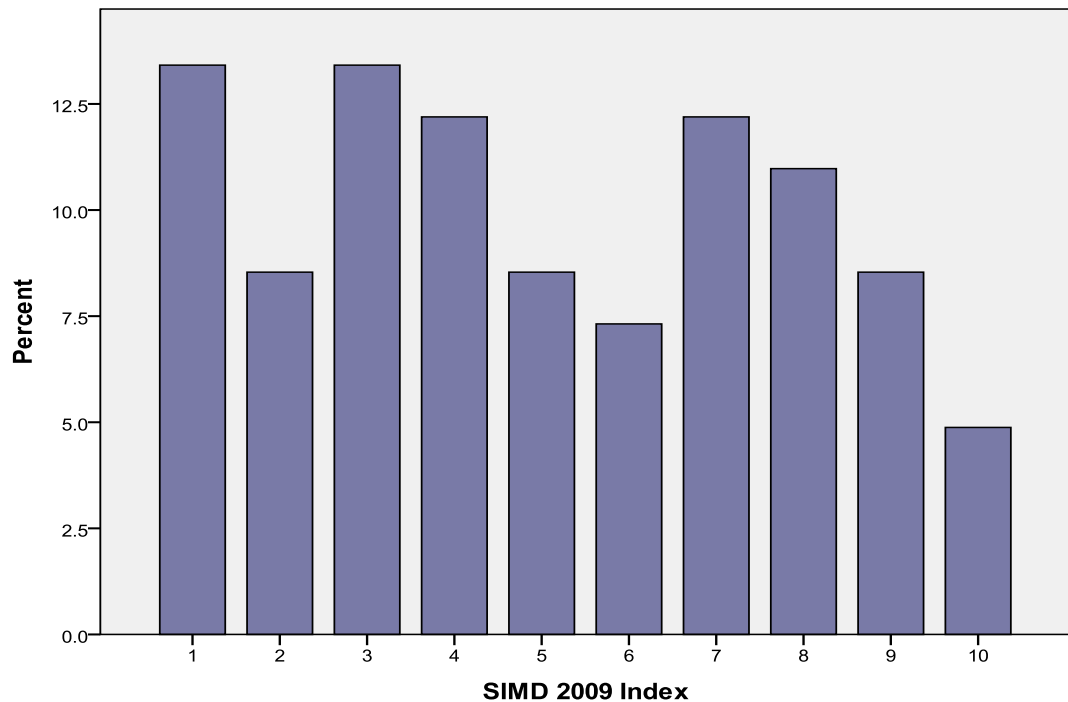


Figure 4: Percentage of participants living in each SMID level

### **3.4.1.1.3 Gender differences**

Independent samples *t*-tests were performed for all variables of interest to test for gender differences. No significant differences were found in the sample for age, SIMD rank, number of traumatic events endorsed, psychological distress at assessment with the service (CORE total score), Cognitive Fusion (CFQ 13 total score), Experiential Avoidance (AAQ II total score), number of trauma symptoms or trauma symptom severity score (PDS).

#### **3.4.1.1.4 Trauma symptoms**

In the whole sample, 51 per cent ( $N = 42$ ), of participants met full DSM-IV diagnostic criteria on the PTSD screen (PDS) used. A further 7 per cent meet Blanchard *et al.* (1994)<sup>1</sup> definition of subthreshold PTSD whilst 31 per cent of those with a history of trauma did not meet either full or subthreshold diagnostic criteria. Table 8 outlines the mean number of trauma symptoms for each of the three DSM-IV symptom clusters in the sample.

*Table 8: Mean number of PTSD symptoms endorsed in the sample*

	Mean	SD
Re-experiencing symptoms (Criterion B)	2.63	1.788
Avoidance symptoms (Criterion C)	3.44	2.529
Arousal symptoms (Criterion D)	2.73	1.938

#### **3.4.1.1.5 Clinician rated diagnosis**

Clinician rated mental health problems without contextual issues such as accommodation, self esteem and general health problems were investigated in relation to trauma history and trauma symptomatology. In the sample, and in accordance with inclusion criteria, these were grouped as anxiety, depression, eating disorder and trauma or any combination thereof and are outlined in Table 9.

A total of 21 per cent of participants ( $N = 17$ ) received a clinician rated diagnosis including trauma. Given that 89 per cent of the sample reported a history of trauma and 51 per cent met full DSM-IV criteria on the PDS, the frequency of PTSD diagnosis was explored in relation to diagnosis and is summarised in Table 10.

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<sup>1</sup> See Systematic Review introduction section 2.3, pg. 10 for the Blanchard *et al.* (1994) sPTSD definition.

*Table 9: The clinician rated diagnoses for the sample*

	N	%
Anxiety	19	23.2
Depression	16	19.5
Mixed Anxiety Depression	21	25.6
Eating Disorder	3	3.7
Eating Disorder & Depression	2	2.4
Eating Disorder & Anxiety	1	1.2
Trauma	1	1.2
Mixed Trauma Depression	6	7.3
Mixed Trauma Anxiety	3	3.7
Mixed Trauma Depression & Anxiety	7	8.5
Other	3	3.7

Note: Other refers to contextual issues where no mental health problem was rated by the clinician.

*Table 10: Percentage of participants meeting PTSD diagnostic criteria in each clinician rated diagnostic group*

	Total	PTSD Diagnostic Criteria Met			% Meeting PTSD criteria
		Yes	No	No TH	
Anxiety	19	6	9	4	31.6
Depression	16	8	8	0	50
Mixed Anxiety Depression	21	14	5	2	66.7
Eating Disorder	3	0	0	3	0
Eating Disorder & Depression	2	1	1	0	50
Eating Disorder & Anxiety	1	0	1	0	0
Trauma	1	1	0	0	100
Mixed Trauma Depression	6	4	2	0	66.7
Mixed Trauma Anxiety	3	3	0	0	100
Mixed Trauma Depression & Anxiety	7	4	3	0	57.1
Other	3	1	2	0	33.3

Note: Total refers to total number of participants in each clinician rated diagnosis group; Other refers to contextual issues where no mental health problem was rated by the clinician; TH = trauma history.

In the clinician rated diagnostic groups of anxiety, depression, mixed anxiety and depression a relatively high percentage of participants (31.5, 50 and 66.7 per cent respectively) met diagnostic screening criteria for PTSD on the PDS. One person out of two in the eating disorder with depression group and one out of three in the ‘other’ group met criteria. As could be expected, all or the majority of participants receiving a clinician rated diagnoses of trauma or mixed trauma diagnoses met diagnostic criteria.

### **3.4.1.2 Trauma history and psychological distress at assessment**

To address hypothesis 1, the distributions of the variables under investigation were first analysed to examine assumptions of normality. The ratio of skewness and kurtosis was calculated in respect to their respective standard errors, which yielded a z-score. An absolute value for the skewness (S) and kurtosis (K) z-scores of more than 1.96 indicates a significant difference from a normal distribution at  $p < .05$  (Field, 2005). Skewness and kurtosis z-scores calculated for the CORE total score ( $zS = 1.49$ ,  $zK = 1.19$ ) and number of traumatic events ( $zS = 1.50$ ,  $zK = 1.30$ ) indicated that normality can be assumed. Similar analysis was conducted with possible continuous variable covariates including age ( $zS = 1.08$ ,  $zK = 1.76$ ) and SIMD rank ( $zS = .60$ ,  $zK = -2.22$ ). The kurtosis z-score for the SIMD rank was negative indicating a flat distribution.

The CORE scores (outcome measuring psychological distress) was not completed at initial assessment for four participants and therefore these cases were deleted for the analyses ( $N = 78$ ) as recommended by Field (2005).

#### **3.4.1.2.1 Hypothesis 1**

*How is trauma history related to psychological distress at initial assessment in the sample? Specifically, it is hypothesised that the number of traumatic life experiences a person experiences will be positively correlated with higher psychological distress at initial assessment.*

Correlations<sup>2</sup> between psychological distress at initial assessment (CORE total score) and number of traumatic events were conducted along with socio demographic variables that are factors known to be associated with trauma history and outcome (Brewin *et al.*, 2000). This formed part of the analysis to assess for covariates which may influence the interpretation of the correlations and are outlined in Table 11 (Tabachnick & Fidell, 1996).

*Table 11: Correlations between number of traumatic events, socio-demographic variables and psychological distress*

	1	2	3	4	5
1. Gender	1.00				
2. Age	-.04	1.00			
3. SIMD Rank	.14	.03	1.00		
4. CORE Score	-.04	.11	-.14	1.00	
5. Number of Events	.14	.34**	-.167	.30**	1.00

\*\* Correlation is significant at the 0.01 level (2-tailed).

In the trauma history sample ( $N = 78$ ) the number of traumatic events was positively correlated with both increasing age and higher CORE score. No other socio-demographic variables, including gender and SIMD rank, were correlated with psychological distress at the time of initial assessment with the service or the number of lifetime traumatic events. The significant relationship ( $r = .304, p = .007$ ) between number of traumatic events and increased psychological distress when attending for assessment with a primary care psychology service supports the first hypothesis. The finding that increased age is associated with increased number of traumatic events was to be logically expected.

<sup>2</sup> All correlations unless otherwise stated are Pearson's correlations.

### 3.4.2 Nature of trauma symptoms

To address remaining hypotheses, the sample distributions of the psychological process variables under investigation were analysed to check the normality by examining the skewness and kurtosis z-scores as detailed above. The z-scores are reported in Table 12 below. No skewness or kurtosis z-scores (absolute) were greater than 1.96 indicating relatively normal distributions of these variables. For this part of the analysis only participants with a history of one or more traumatic life events was used ( $N = 73$ ). On a missing values analysis, two participants did not complete the reverse side of the VLQ questionnaire which equates to 2.4 per cent in the missing unit univariate analysis. The mean VLQ Composite score was substituted as the missing data made up less than 5 percent of the missing values. This is in line with a conservative cut-off recommended by Schafer (1999). Others such as Downey & King (1998) have suggested that on likert-type scales mean replacement remains a good representation of the original data for up to 20 per cent of missing data.

*Table 12: Calculated z-scores for variables under investigation*

	z-scores	
	<i>Skewness</i>	<i>Kurtosis</i>
CFQ 13 Total	-1.28	-0.71
AAQ II Total	-0.64	-1.22
VLQ Composite	0.22	-0.78
Number of Events	1.82	-1.16
PDS Symptom Severity Score	1.42	-0.95
PDS Total Number of Symptoms	-1.41	-1.54

Note: CFQ=Cognitive Fusion Questionnaire; AAQ=Acceptance and Action Questionnaire; VLQ=Valued Living Questionnaire; PDS=Posttraumatic Stress Diagnostic Scale.

### 3.4.2.1 Correlations

#### 3.4.2.1.1 Preliminary analyses

As per Tabachnick & Fidell (1996), if sociodemographic variables are correlated with the dependent variable these should be considered covariates and controlled for in subsequent regression analyses. As a result, correlations between age, gender, SIMD rank and trauma symptom severity were conducted. No significant correlations were found. Therefore these demographic variables were not included as covariates in later analyses. In order to provide a comparison with previous research in other samples which suggests that ACT variables correlate well with general psychological distress as measured by the CORE (e.g. community sample, Gillanders *et al.*, 2010), correlations were conducted between cognitive fusion, experiential avoidance, consistency of valued action and general psychological distress at initial assessment with the service for those with a trauma history and available CORE scores<sup>3</sup> ( $N = 69$ ). As these measures were conducted at different times, no conclusions regarding the relationship can be drawn other than noting the associations that were found in the sample. All variables were correlated at the  $p < .01$  or better level (see Table below).

*Table 13: Correlation matrix between cognitive fusion, experiential avoidance, valued action, number of events and posttraumatic stress symptom severity*

	1	2	3	4
1. CFQ 13	1			
2. AAQ II	.76***	1		
3. VLQ	-.43***	-.50***	1	
4. CORE Total Score	.46***	.55***	-.35**	1

*Note:* CFQ = Cognitive Fusion Questionnaire; AAQ = Acceptance and Commitment Questionnaire; VLQ = Valued Living Questionnaire; CORE =Clinical Outcomes in Routine Evaluation. \*\*  $p < 0.01$ , \*\*\*  $p < 0.01$  ( 2-tailed)

<sup>3</sup> The CORE measure was not completed for four participants with a trauma history and therefore these cases were deleted for the analysis as mentioned in section 3.4.1.2.



### 3.4.2.1.2 Hypothesis 2

*What is the relationship between cognitive fusion, experiential avoidance, not living in accordance with identified values and trauma symptomatology? Specifically, it was hypothesised that cognitive fusion, experiential avoidance and living less consistently with important values would be positively related to trauma symptom severity.*

To determine the relationships between the variables of interest for hypotheses 2, correlations were conducted between cognitive fusion, experiential avoidance, consistency of valued action and posttraumatic stress symptom severity. Most variables were significantly correlated at the  $p < .001$  level with the VLQ correlated with the PDS symptom severity score at the  $p < .01$  level and not correlated with number of traumatic events. Cognitive fusion, experiential avoidance and posttraumatic stress symptom severity were positively correlated whilst valued action was negatively correlated with these variables. The results are summarised in Table 14 below.

*Table 14: Correlation matrix between cognitive fusion, experiential avoidance, valued action, number of events and posttraumatic stress symptom severity*

	1	2	3	4	5
1. CFQ 13	1				
2. AAQ II	.78***	1			
3. VLQ	-.41***	-.46***	1		
4. PDS (number of traumatic events)	.36***	.40***	-.19	1	
5. PDS (symptom severity scores)	.46**	.55***	-.35**	.37**	1

*Note:* CFQ = Cognitive Fusion Questionnaire; AAQ = Acceptance and Commitment Questionnaire; VLQ = Valued Living Questionnaire; PDS = Posttraumatic Stress Diagnostic Scale. \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$  (2-tailed).

The results indicated that hypothesis 2 was supported, with higher levels of both cognitive fusion and experiential avoidance positively related to trauma symptom

severity and increased levels cognitive fusion, experiential avoidance and trauma symptom severity correlated to lower scores of valued action i.e. negatively correlated.

### **3.4.2.2 Mediation analysis**

To explore whether two ACT processes namely cognitive fusion and experiential avoidance mediated the relationship between number of traumatic events and trauma symptom severity (hypothesis 3), the Preacher and Hayes (2008) bootstrapping resampling method was employed. This was repeated using a further ACT variable that is, living consistently with values, as the dependent variable (hypothesis 4). This regression method does not rely on parametric assumptions being met and therefore sample distribution diagnostics were not performed (Nevitt & Hancock, 2001; Hayes, 2009). The bootstrapping method involves repeatedly resampling the data with replacements to establish an empirical approximation of the sampling distribution of the indirect effect. The indirect effect was computed in each sample using bias corrected 95% confidence intervals and the recommended 5,000 bootstrap samples (Preacher & Hayes, 2004). As significant associations between the independent variable (trauma history) and dependent variable (trauma symptom severity) had been established, mediation rather than indirect effects were being measured. That is, the model tested whether the proposed mediator variables partially or fully accounted for the relationship between trauma history and trauma symptoms severity (see Hayes, 2009 for a brief discussion on this distinction or Mathieu & Taylor, 2006 for a more in depth review).

The mediation effect is significant if the upper and lower bounds of the bias corrected confidence intervals do not contain zero i.e. the mediation effect is not zero at the set confidence level ( $p < .05$ ).

### **3.4.2.2.1 Hypothesis 3**

*Does fusion and/or experiential avoidance mediate the relationship between the number of traumatic experiences (trauma history) and trauma symptoms severity?*

The simple mediation model results of the bias corrected confidence interval (BC CI) at 95 per cent indicated that cognitive fusion significantly mediated the relationship between trauma history and trauma symptom severity (lower *BC CI* = .3, upper *BC CI* = 2.02). Similarly, the BC CI results indicated that experiential avoidance significantly mediated the relationship between trauma history and trauma symptom severity (lower *BC CI* = .54, upper *BC CI* = 2.63). However, when examined together as shown in Figure 5 below, the *BC CI* for experiential avoidance remained significant (lower *BC CI* = .30, upper *BC CI* = 2.83) whilst the result for cognitive fusion was no longer significant (lower *BC CI* = -.76, upper *BC CI* = 1.02).

The multiple mediation model accounted for 33 per cent of the amount of variance in trauma symptom severity ( $R^2 = .33$ ). In addressing hypothesis 3, experiential avoidance mediates the relationship between number of traumatic experiences and trauma symptom severity over and above a possible shared mediation role with cognitive fusion.

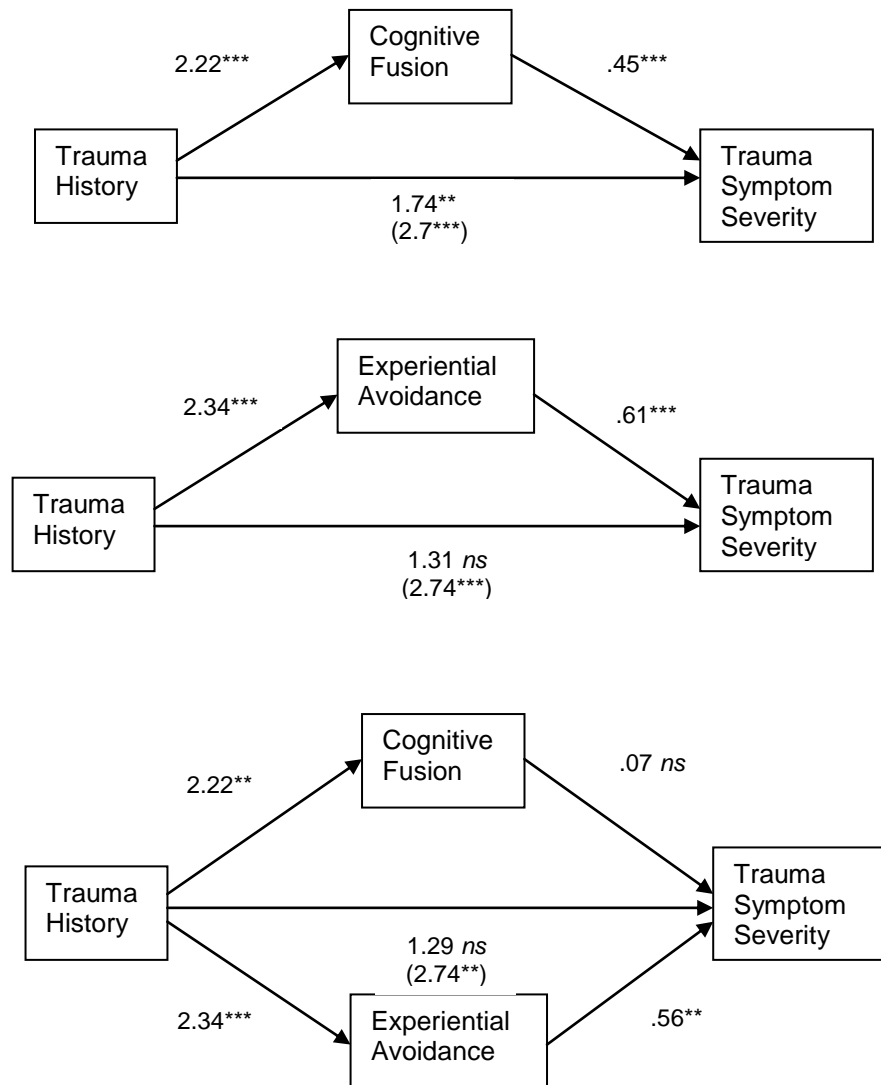


Figure 5: Diagrams of regression analyses depicting the role of cognitive fusion and experiential avoidance in mediating effect of trauma history and posttraumatic stress symptom severity

Note: All paths are unstandardised coefficients. Those inside parentheses are path effects prior to proposed mediator \*\*  $p < .01$ , \*\*\*  $p < .001$ , ns = not significant

#### **3.4.2.2.2 Hypothesis 4**

*What is the relationship between all the ACT variables in the sample? Does fusion and/or experiential avoidance mediate the relationship between the number of traumatic experiences (trauma history) and consistency of valued action?*

As a non significant association<sup>4</sup> had been established between the independent variable (trauma history) and dependent variable (living consistently with values), this model tested for an indirect effect of trauma history on valued action through either fusion, experiential avoidance or both. An indirect effect refers to a linking mechanism that ties two uncorrelated variables together through a significant relationship with the proposed linking variable<sup>5</sup>.

Bias corrected confidence intervals for cognitive fusion did not contain zero (lower *BC CI* = -3.0, upper *BC CI* = -.53) therefore a significant indirect effect of trauma history on valued action through cognitive fusion existed. A similar effect in the sample was found for experiential avoidance (lower *BC CI* -3.8, upper *BC CI* = -.72). For the combined indirect effects model, the total *BC CI* (lower = -4.1, upper = -.78) of fusion and experiential avoidance did not contain zero and therefore can be accepted as a significant indirect effect at the 95 % confidence level. However, individually in the multiple model, the fusion and experiential avoidance *BC CI*'s contained zero and were not significant on their own. See Figure 6 for a diagrammatic representation on the pathways.

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<sup>4</sup> See correlation matrix outlined in Table 14 above.

<sup>5</sup> The reader is again referred to Hayes (2009) and Mathieu & Taylor (2006) for discussions on the distinction between indirect and mediation effects.

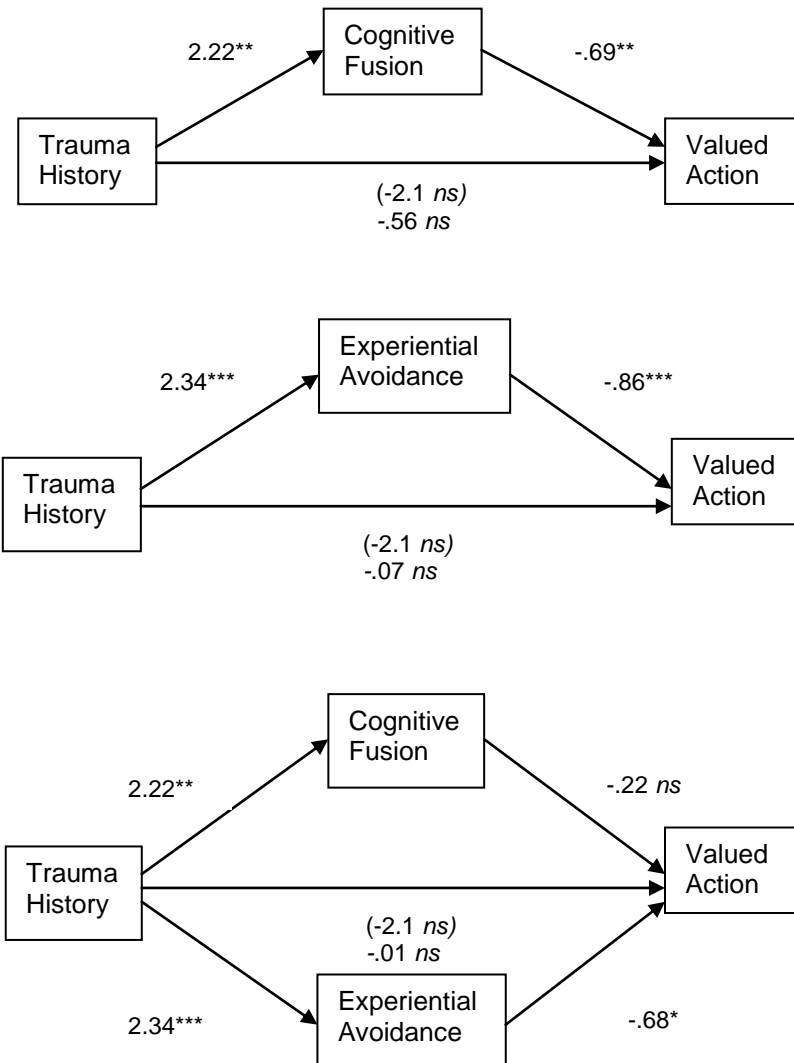


Figure 6: Diagrams of regression analyses depicting the indirect role of trauma history on valued action through cognitive fusion and experiential avoidance

Note: All paths are unstandardised coefficients. Those inside parentheses are path effects prior to proposed mediator. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ , ns = not significant

## 3.5 Discussion

### 3.5.1 Sample

The results of the current study relies on clinician administered self report measures and are based on a specific sample of help seeking individuals who are able to access primary care psychological within NHS Tayside. Although the service covers a mixed rural and metropolitan geographical area, 65 per cent of the sample was made up from the Dundee City local authority catchment. The analyses using SIMD codes demonstrated that all levels of deprivation were equally represented in the sample. This finding was not in line with published estimates, which have shown that Dundee City is amongst the five local authorities with the largest proportion of their population in the 15 per cent most deprived dataset in Scotland (Scottish Government, 2009). In addition, when compared with economically advantaged populations, socio-economically disadvantaged civilian populations are at increased risk for a range of mental disorders following exposure to trauma (Brewin *et al.*, 2000). This may indicate that individuals who live in the most deprived communities in the Tayside area are unable to access psychological services effectively. However, this suggestion is from data from a limited sample and would need to be established in further research within the service and/or replicated elsewhere.

Opinion on what is an acceptable response rate in survey or questionnaire based research varies widely, with some indicating a minimum of 75 percent is required whilst other indicating above 50 per cent is acceptable (McColl *et al.*, 2001). With the reasonable response rate of 69 per cent, the potential for bias or systematic error in the sample is acceptable. As a non-responder analysis was not possible in the present study, there is potential that important differences in characteristics between those who choose to respond and those who do not were not captured. This is an important area to consider in future research and will require working closely with the local research and ethics committees to design an appropriate methodology which can be implemented in NHS settings.

In the sample, no gender differences were established in terms of, prevalence of trauma history, extent of exposure and psychological outcomes including general psychopathology at initial assessment with the service (total CORE score) or trauma outcome (PDS trauma symptom severity). This finding differs from well established risk factors for predicting PTSD (Brewin *et al.*, 2000) and there may be a number of reasons for this. Firstly, the sample is made up of help seeking individuals who experience clinically significant symptoms which the PDS symptoms severity scale taps into. Secondly, there may be an element of sampling bias in the data collection method as the study relied on an opt-in system and clinician judgement on who on caseload to approach for recruitment. This was partly addressed by the clinician guideline explicitly asking clinicians to approach everyone on case load at a given time unless deemed inappropriate for clinical reasons. Furthermore, the researcher was in regular contact with clinicians to ensure those supporting the study were following the guidelines. However, the inherent difficulties with an opt-in system could not address self selection of participants. For research ethical reasons, conducting a non-participant analysis was not possible in a study of this kind and therefore the results pertain to a cross section of individuals who were willing to take part in a study investigating the extent and nature of trauma symptoms. For this, and the sampling reasons discussed above, the findings should be interpreted cautiously.

When considering the response rate and comparing the participants who took part in the study across basic demographic data, it was found that the sample was similar to those presenting to the service in the past year. For instance, the gender split and age range in the service was reported to be 65 per cent female and 16 to 66, compared to 69.5 percent female and 17 to 64 in the present study. It is therefore reasonable to assume that the sample recruited to the study were representative of those attending the service as a whole. However, as has already mentioned, it was a self selecting sample constituting of those willing to self report difficult experiences such as previous trauma. Taken together with the fact that the data collection method relied on self report measures, the prevalence rates may be an underestimate of trauma history and therefore trauma symptoms in the service (as has also been suggested by Johnson, Maxwell & Galea, 2009).



### **3.5.2 Extent of trauma symptoms in the service**

#### **3.5.2.1 Trauma history**

The 89 percent lifetime prevalence of exposure to trauma in the sample was similar to that of a population based study on a representative sample of Detroit residents which reported 89.6 per cent exposure (Breslau *et al.*, 1998). Other epidemiological studies have not reported such high prevalence rates, for example, the Kessler *et al.* (1995) National Comorbidity Survey reported 60.7 percent for men and 51.2 percent for women. In the Breslau *et al.* (1998) study, the mean number of events was significantly higher for men than for woman (5.3 and 4.3 respectively and total sample 4.8). In the present study there were no such gender differences and the mean number of events was lower at 2.62. However, in the Breslau *et al.* (1998) study, trauma types were classified into 19 specific events and in the current sample a standardised measure covering 12 events was used which may explain the relatively higher exposure in the metropolitan community population.

With regards to lifetime prevalence of exposure in clinical samples, there was limited research available with which to compare the present sample directly. For example, a number of studies focus on trauma history with comorbid psychiatric problems which were exclusion criteria for the current research such as psychosis and substance misuse (e.g. Cusack, Frueh & Brady, 2004). Secondly, there are a number of studies that investigate health care service use in primary care samples which do not include psychological services (e.g. Zlotnick *et al.*, 2004). However, the overall prevalence of trauma history in the sample was in line with the highest epidemiological estimates from the US, as reported by Breslau *et al.*, (1998), which is an important finding with regards to the relative lack of epidemiological research in the UK.

The first hypothesis that participants with a history of trauma would present to the service with higher general psychological distress was supported. This putative hypothesis is in line with findings that PTSD symptoms are associated with poor

psychological outcomes (Kessler *et al.*, 1995). This has clear implications for the screening and treatment of trauma in primary care psychology services.

### 3.5.2.2 Trauma type

The lifetime prevalence of exposure to various traumatic events in the sample was similar to that reported in the Breslau *et al.* (1998) study and others such as Kessler *et al.* (1995), Norris (1992) and Stein *et al.* (1997) with the lowest exposure to military combat, torture and imprisonment events. The next most frequently endorsed events being grouped together as other assaultive violence (e.g. physical attack and sexual assault) along with serious accident. Finally, the most frequently endorsed events being exposure to life threatening illness (self or other) or the sudden death of another person. In saying this, in the above US population studies, exposure to natural disaster and fire was greater than in the current sample.

Exposure to intentional violent acts has been associated with the highest conditional probability of developing PTSD amongst both genders (Johnson, Maxwell & Galea, 2009). This is followed by exposure to the sudden death of a loved one in the Breslau *et al.* (1998) study. The finding that exposure to such traumas are amongst the highest reported in the present sample (e.g. 56 % of men were exposed to physical assault by a stranger, 42 % of females were exposed to sexual assault by a known person and 49% of the total group reported exposure to life threatening illness or sudden death of another person<sup>6</sup>) supports the high reporting of PTSD symptoms as discussed in the next section. In addition, for women the lifetime prevalence of PTSD was shown to be highest for those exposed to rape (45.9%), childhood physical abuse (48.5%) and sexual molestation (36.5%) (Kessler *et al.*, 2005). Again, as self reported exposure to these traumatic experiences was highly prevalent in the sample of which the majority were women, it demonstrates the importance of assessing for such events in primary care psychology services.

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<sup>6</sup> See table 7 in the results section for the full breakdown of exposure by gender

### 3.5.2.3 Trauma symptoms and PTSD

The high rates of trauma symptoms and PTSD in the present study were 51 per cent of participants met full DSM-IV diagnostic criteria, and a further seven per cent meeting Blanchard *et al.*'s (1994)<sup>7</sup> definition of subthreshold PTSD, is difficult to compare to other studies. Firstly, self report measures have well known methodological difficulties some of which have already been discussed. Others difficulties include, recall bias where participants may fail to recall previous exposure as it is not represented by one of the trauma history categories and therefore prevalence may be even higher than estimated (Johnson, Maxwell & Galea, 2009).

Secondly, trauma history increases the risk of other disorders apart from PTSD with depression and substance abuse being the most prevalent (Resick & Calhoun, 2001). It is therefore difficult to ascertain if the symptoms detected by self report screening instruments are attributable to the specific traumatic event rather than general psychopathology or a pre-existing disorder. Comorbidity was not controlled for in the present study for various reasons, the most notable being item burden for participants and extended clinician time. The Symptom Checklist 90- Revised (SCL-90-R-GSI; DeRogatis, 1992) was initially considered as part of the proposal, however, this would have doubled the patient participation time and clinicians may have been reluctant to give up more of their time in treatment sessions. However, screening instruments for PTSD include re-experiencing and trauma specific avoidance items which make a case for the role of a traumatic event in contributing to the symptoms measured (Brewin, 2005). In addition, as experienced clinicians were administering the questionnaires, participants were reminded to keep in mind the most upsetting event whilst completing questionnaires and they were on hand to help distinguish if an event fell within the given categories or not. Although the study cannot rule out the contribution of comorbid disorders to symptomatology, the clinical sample reported high levels of trauma symptoms as measured by the PDS.

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<sup>7</sup> See Systematic Review introduction section 2.3, pg. 10 for the Blanchard *et al.* (1994) sPTSD definition.

Given that the systematic review included in the beginning of the thesis concluded that sPTSD is as, or more prevalent than PTSD, across a number of trauma types, the relatively low prevalence of subthreshold symptoms as compared to full was surprising. One reason for this may be that it is reasonable to suggest that the PDS (as with other self report measures of trauma) overestimates the number of participants reaching full DSM-IV criteria for PTSD. This is in order to establish a reasonable balance between sensitivity and specificity which lead to some false positives and false negatives (Brewin, 2005). As a result, the level of sub clinical symptoms in the sample will be higher than reported in this study. Future research with clinical samples should include a functional impairment measure so that this association can be established. This will go some way to address the research gap reported by the above systematic review.

#### **3.5.2.4 Discrepancy between reported trauma and clinician identified problems**

The PDS was one of the only self report measures that has reported psychometric data based on a psychiatric outpatient sample (Sheeran & Zimmerman, 2002).

Additionally, the PDS has demonstrated good overall efficiency of 88 per cent which is the percentage of respondents correctly classified as having PTSD (Brewin, 2005). In the sample, 21 per cent of participants received a clinician rated diagnosis including trauma, whilst 51 per cent of the sample met full DSM-IV criteria for PTSD on the PDS. This discrepancy has important implications concerning whether there may be a level of PTSD symptomatology that is going unrecognised and/or untreated in the current sample. However, there may be a number of other explanations for this finding, such as, participants may not want to disclose previous trauma to their clinician, patients may not consider previous trauma as related to their current problems such as anxiety or depression and clinicians could have chosen to focus on current presenting problems rather than trauma history at the given stage of treatment. In addition, due to high comorbidity with disorders which are detected by regular screens used in primary care psychology services (e.g. Beck Depression Inventory,

Beck Anxiety Inventory & CORE) uncovering trauma symptoms may be difficult (Lecrubier, 2004). Taken together with evidence that comorbid symptoms of anxiety or depression may be as a result of the trauma in the first place (Kessler *et al.*, 1995) this is an important finding in the present sample. As the specific reasons for such discrepancies were not investigated in this instance (and did not form part of the aim of the thesis), further exploration of whether clinicians routinely assess for trauma related symptoms or not, is indicated within the service and elsewhere.

### **3.5.3 Nature of trauma symptoms**

#### **3.5.3.1 ACT Processes and general psychological functioning**

The ACT process measures of cognitive fusion (CFQ 13), experiential avoidance (AAQ II) and valued action (VLQ) were correlated (all correlations significant at the  $p < .01$  level or better) with two outcome measures routinely used to assess for general psychological distress (CORE) and trauma symptom severity (PDS). The first of these correlations is difficult to make inferences from in that the CORE measure was conducted when participants initially presented to the service for assessment and the ACT measures were conducted mid treatment (or once the clinician had established a therapeutic relationship with their patient). However, a similar correlation was reported by Gillanders *et al.* (2010) in a community sample between the CFQ and CORE total score ( $r = .59, p < 0.001$ ). As the fusion measure was completed after the start of treatment, it may be expected that this relationship would be diluted to some extent by psychological intervention. The finding that there was still a highly significant relationship with fusion around mid-treatment, suggests that fusion may play an important role in general psychopathology as postulated by the ACT model. There are a number of cautions in this regard; firstly, the fusion questionnaire may be tapping into experiential avoidance processes and *vice versa* as demonstrated by the strong correlation between the AAQ II and CFQ 13 in this study and elsewhere (Gillanders *et al.*, 2010). This would suggest that it may be either fusion or experiential avoidance or even a shared third construct that is correlated with general

pathology. Secondly, therapeutic interventions may not be aimed at addressing cognitive fusion or experiential avoidance as put forward by the ACT model and therefore the expectation that this relationship is somewhat diluted does not hold. Either way, there was a strong relationship between all the ACT variables and psychological functioning at initial assessment which would point towards the importance of these processes in the treatment of psychopathology in the sample studied.

### **3.5.3.2 ACT processes and trauma symptom severity**

When considering the ACT measures and trauma symptom severity, again there was an indication that these processes are highly related to outcome in the sample of responders. These will be looked at in turn and results from the multiple mediation analyses considered within the ACT model throughout.

#### **3.5.3.2.1 Experiential avoidance**

Previous studies have shown that women with a history of childhood sexual abuse (CSA) are more likely to use coping strategies to avoid difficult thoughts and feelings than those without (Polusny & Follette, 1995; Marx & Sloan, 2002). In addition, the Marx & Sloan (2002) study demonstrated that avoidance (as measured by the AAQ) mediates the relationship between a history of CSA and psychological impairment ( $R^2 = .30$ ), lending support to the premise that it is not the CSA experiences *per se* that leads to poor outcome, rather, that it is the attempt to control (suppress or regulate) private internal experiences that results in subsequent pathology. Plumb, Orsillo and Luterek (2004) demonstrated similar mechanisms in a sample with exposure to a diverse range of trauma experiences. This study found that individuals who used experiential avoidance as measured by the AAQ as a coping mechanism were more likely to display general psychological distress. The AAQ in this study was a better predictor of the unique variance in the measures of depression (28%) in a clinical sample and of general distress (31%) in an undergraduate sample than trauma severity

which was reported as 13 per cent for both these samples. A further study, by Tull *et al.* (2004) also indicated that experiential avoidance was more closely associated with general psychological distress rather than trauma symptoms.

The present study found a similar mediating effect of experiential avoidance on trauma symptom severity ( $R^2 = .33$ ) as the Marx & Sloan (2002) paper discussed above. As the outcome measure in the Marx & Sloan (2002) study was the Global Severity Index of the Symptom Checklist 90- Revised (SCL-90-R-GSI; DeRogatis, 1992) and the present study used the PDS symptom severity scores, such a similar effect may indicate that the trauma specific outcome (PDS) reflects similar high levels of distress, co-morbidity and functional impairment as the GSI. This has been shown in a military population where the items of SCL-90 were used to develop a screen for PTSD (Weathers *et al.*, 1996). In addition, more individuals with PTSD (52%) report widespread dysfunction as compared to those with a non-PTSD diagnosis (16%). This figure is said to rise to 87 per cent for those with PTSD and a comorbid disorder (Nemeroff *et al.*, 2006). As a result, it is reasonable to assume individuals with PTSD symptoms would score highly on an outcome such as the GSI as well as a more specific trauma measure. When considering the findings by other studies that experiential avoidance was more closely associated with general psychological distress rather than trauma symptoms, it may be that the PDS was a good measure of general psychological distress in the given sample rather than a diagnostic measure of PTSD.

Overall, in the present study there was evidence supporting hypothesis 2 and 3 in that individuals who use experiential avoidance as a coping strategy present with higher levels of trauma symptoms and that experiential avoidance mediates the relationship between trauma history and trauma symptom severity. These findings are broadly in line with previous research across different samples.

### 3.5.3.3 Cognitive fusion

To the author's knowledge there is no published research on the role of cognitive fusion in trauma related symptomatology in a clinical population. However, related concepts, such as thought suppression, rumination and cognitive avoidance, have been well established (Wegner & Zanakos, 1994; Williams & Moulds, 2007). Theoretically such concepts are said to be forms of experiential avoidance as measured by the AAQ II discussed above, whereas cognitive fusion in the ACT model is related to experiential avoidance but not considered a form of experiential avoidance. As discussed in the introduction, the ACT model of trauma distress is the development of maladaptive behaviours to control thoughts, memories or physical sensations related to the experience i.e. experiential avoidance. The process of cognitive fusion may even precede experiential avoidance in that individuals who tend to develop symbolic representations of difficult experience (i.e. hold thoughts and beliefs about experience and self as literally true) also tend to find ways to control such representations and therefore employ experiential avoidance (Batten, Orsillo & Walser, 2005). Therefore, fusion can contribute to pathology as it has the potential to lead to avoidance and trap a person in the experience of a traumatic past.

In the present sample, cognitive fusion was correlated with higher levels of trauma related symptom severity and also mediated the relationship between trauma history and trauma symptom severity. However, as cognitive fusion and experiential avoidance are highly correlated ( $r = .78$ ) it is difficult to uncouple the relationship between the two variables as these measures may overlap to a large extent within the given sample. In the multiple mediation model used such a high correlation is particularly problematic in that multicollinearity leads to unstable unique estimates of the regression coefficients and difficulty in assessing the importance of each variable (Field, 2005). It has been suggested by Field (2005) that a correlation of .80 or larger is a way of identifying multicollinearity and in the present study the correlation between the AAQ II and CFQ 13 was approaching that figure. Such issues are limitations in the interpretation of the multiple regression model put forward as from



the results one can only infer that experiential avoidance over and above cognitive fusion explains the variance reported.

However, both cognitive defusion and experiential avoidance techniques are well established and widely used in ACT, yet to date the AAQ is far more prominent in the published research (see Blackledge, 2007; Hayes, Strosahl & Wilson, 1999; Luoma & Hayes, 2009 for discussions and examples of the ACT techniques). Potentially, ACT research may benefit from being more specific with regards to the roles of these two processes (if indeed these two scales measure separate processes) in psychopathology. For instance, a recent paper by Hayes *et al.* (2010) measured the changes in proposed mechanisms during acceptance-based behaviour therapy for generalised anxiety disorder (GAD). This paper reported changes on acceptance (as measured by the AAQ II), worry and valued action as a way of testing the following theory; '*GAD is maintained through a reactive and fused relationship with one's internal experiences and a tendency towards experiential avoidance and behavioural restriction*' (p 243). Although this analysis was a preliminary investigation using secondary data, if fusion is going to be central to theoretical postulations of this sort, there is much scope to attempt to reliably measure this construct. Further use and development of the CFQ13 may go some way to address this issue. In addition, research may then go on to establish associated changes in these two proposed mechanisms over time (as done in the Hayes *et al.*, 2010 study) and importantly endeavour to distinguish between interventions which target these processes so that the underlying mechanisms may be better understood.

Another possible explanation may be that in the ACT model, where experiential avoidance and cognitive fusion are two of six core processes which explain psychological flexibility, the AAQ II is a better measure of psychological flexibility than experiential avoidance. This has recently been demonstrated and discussed in detail by Bond *et al.* (in press). If this can be established, it may well be that using the CFQ 13 versus the AAQ II to measure process changes over time will not allow for a differentiation between fusion and experiential avoidance, as they both contribute to a shared construct of psychological flexibility which the AAQ II is good at measuring.

Despite the difficulties in separating out the two variables, cognitive fusion was associated with higher levels of trauma symptoms and on its own it mediates the relationship between trauma history and trauma symptom severity which supports hypothesis 2 and 3 as with experiential avoidance. Coupled with the findings in this study and elsewhere (Gillanders *et al.*, 2010) that fusion correlates with psychological distress in general, there is a need to investigate cognitive defusion interventions more widely in clinical populations as these may provide therapeutic advances in the treatment of PTSD symptoms.

#### **3.5.3.4 Valued Action**

Hypothesis 2 of the study where cognitive fusion, experiential avoidance and living less consistently with important values would be related to trauma symptom severity, was confirmed as the VLQ was significantly related to trauma symptom severity. In the present sample, valued action or behaving in a congruent way with personal values as measured by the VLQ correlated significantly with the other ACT measures of cognitive fusion and experiential avoidance. Participants who reported higher levels of fusion and experiential avoidance reported less committed action across important areas of their life. This finding lends support for the ACT model where processes of fusion and experiential avoidance can lead to inflexible and maladaptive behaviour patterns which override acting in accordance with desired values. The present finding indicates that the VLQ may be a good measure of therapeutic change or outcome when investigating changes in cognitive fusion or experiential avoidance as discussed above. A recent study has demonstrated that change in valued action was related to GAD treatment responders using three different anxiety measures (Hayes, Orsillo & Roemer, 2010). As the overall goal of an ACT intervention would be to facilitate living in accordance with one's values despite the presence of difficult forms of internal experiences (or symptoms), the present results indicate that the VLQ is a promising measure in this regard. In addition, the use of the VLQ as a dependent

variable (outcome measure) in the subsequent mediation analysis was warranted by this result.

The finding that cognitive fusion and experiential avoidance together played an indirect role in the trauma history and valued action relationship was difficult to interpret as there is currently no published research with which to compare the findings. The indirect effect found implies that fusion and experiential avoidance together are processes that intervene between a history of trauma and valued action. This finding supports the ACT model well. There is one further consideration. Valued action is not related to trauma history in the sample but is related to trauma symptom severity. As discussed above, trauma symptom severity in this sample may be more indicative of general psychological distress rather than specific trauma severity. As Wilson *et al.*, (2010) have reported provisional support for a correlation of the VLQ with psychological distress the finding that there is not a significant relationship with trauma history is unsurprising.

### **3.5.4 Reflection on study methodology**

#### **3.5.4.1 Limitations**

Limitations of a study of this nature include general methodological difficulties with cross-sectional designs and the ability to make causal inferences or generalisations beyond the sample. In addition, there are methodological issues relying on self report measures, specifically in this case the CFQ 13 which currently does not have published psychometric data. However, the validity and reliability of the CFQ 13 is promising (Gillanders *et al.*, 2010) and further reliability and validity cannot be established without projects such as the present one using the measure to contribute to its development.

Another limitation pertains to the specific, clinical help seeking population of whom a majority were females and all were Caucasian. This limits the generalisation of the

findings to populations out-with these demographics. As co-morbidity was not controlled for in the present study, it has been difficult to establish the extent to which the PTSD measure (PDS) measured specific trauma symptomatology and PTSD or general psychological distress. Such issues lead to difficulties in making inferences regarding the diagnosis of PTSD in the sample.

Possible multicollinearity between the CFQ 13 and AAQ II in the multiple mediation models was problematic in that it limits the measure of multiple correlation ( $R$ ), leads to unstable unique estimates of regression coefficients and difficulty in assessing the importance of each variable (Field, 2005). As a result, the present study cannot make specific inferences about the importance of either variable in the mediation models tested over and above what appears to be a shared construct of experiential avoidance or psychological flexibility as per the ACT model. With the AAQ II, it has been suggested that the score describes both psychological flexibility and experiential avoidance (Bond *et al.*, in press). However, in the ACT model, psychological flexibility involves six core processes including experiential avoidance and cognitive fusion (Hayes *et al.*, 1996). Consequently, the construct validity of the AAQ II and CFQ 13 as an isolated measure of experiential avoidance and cognitive fusion respectively is uncertain.

Despite a reasonable response rate, there may have been important differences between responders and non responders in a clinical sample. Such differences were not investigated due to ethical considerations and further projects may develop ways in which to overcome such issues by working closely with the research and ethics committee in the design stages of a project.

#### **3.5.4.2 Strengths**

The present study included both descriptive and correlational designs and presents cross sectional observations in a clinical sample rather than rely on student populations or specific trauma type such as CSA. The first part provided much needed evidence

for the incidence and prevalence of trauma history and trauma symptoms in a primary care psychology service in Scotland, where trauma focused care initiatives are being considered (NHS Education for Scotland & Scottish Executive, 2008). In summary, the present results provide evidence that trauma exposure is highly prevalent and that it plays a significant role in general psychological distress experienced by those who are attending for assessment in the service. There are some indications that the service does not reach the most disadvantaged communities with clear implications for local government initiatives. Such descriptive data makes an important contribution to both local service, and available national information, on the extent of trauma history and related symptomatology in Tayside, and paves the way for further research in this regard. As current policy and clinical practice guidelines rely on extant epidemiological data from the US, the present study is an important step in understanding the local picture which in turn can inform service planning.

While the current study's results are consistent with previous findings that experiential avoidance mediates or predicts trauma symptom severity, it also sought to investigate the role of cognitive fusion in this relationship which is a unique contribution to the literature. The direct testing of cognitive fusion against experiential avoidance in a clinical sample has investigated logical mechanisms put forward by the ACT model of psychopathology and goes some way to providing a plausible account of part of the theory. That is, despite the covariance between cognitive fusion and experiential avoidance measures, these processes are highly correlated with both general psychological distress at initial assessment and trauma symptom severity in a clinical population, lending some support for the general ACT model of psychopathology and valued living.

A further strength, alluded to in previous sections, is that the present findings are based on a clinical sample presenting with a variety of traumatic experiences. Previous research reviewed for the current study has been conducted on specific trauma type such as child sexual abuse (Marx & Sloan, 2002; Polusny & Follette, 1995) with female only populations (Tull *et al.*, 2004) or with undergraduate student populations (Plumb, Orsillo & Luterek, 2004). As a result, the findings provide

further evidence for the role of experiential avoidance and cognitive fusion in trauma symptomatology and PTSD.

Finally, the study used bootstrapping for the regression model which overcomes many of the difficulties associated with the Barron and Kenny (1986) mediation procedure, and the more statistically rigorous *Sobel test* method, which relies on distribution assumptions and standard error estimate methods. In simulation research, bootstrapping has been shown to have the highest power, best control of Type I error and to be more powerful than the *Sobel test* (Hayes, 2009).

### **3.5.5 Theoretical and clinical implications**

The findings of the present study indicate that trauma history and prevalence of trauma related symptoms are pervasive in the sample studied. In addition, those with a history of trauma were more likely to be amongst the most distressed patients presenting to the service for assessment. There was evidence suggestive that those in the most disadvantaged communities are unable to access services and therefore prevalence reported here may well be an underestimate of the problem. Furthermore, such data potentially identify an area of unmet need. The prevalence findings along with indications that trauma history is not assessed as part of clinician rated diagnosis in some cases suggests that evaluation of routine screening and/or asking about trauma experiences during assessment may be of benefit in the service. Self report measures of PTSD such as the one used in this study may identify those who should be assessed further for PTSD using a clinician administered scale or with further clarification regarding reported symptoms and related functioning. Expected false positives with the diagnostic cut-off of such instruments may indicate that there is a large level of sub clinical PTSD (as opposed to the full PTSD rate found in the sample) which may need to be addressed. For instance, if underlying trauma symptoms are not treated or if patients have not considered previous trauma experiences as related to their current problems they may be at risk of relapse. However, such suggestions are currently

speculative and more research is required to establish if this relationship is indeed the case in the service and elsewhere.

As both cognitive fusion and experiential avoidance, as measured by the CFQ 13 and AAQ II, were highly correlated, further research should be conducted to establish if these constructs can be measured independently in a clinical sample. This would help to establish relative change in both proposed mechanisms over time during ACT interventions, understand the relationship between the processes more fully and develop more specific interventions.

With the findings that ACT processes of cognitive fusion, experiential avoidance and valued action are correlated with level of distress and trauma symptom severity there are clear implications for developing evidence based interventions which target these processes. Larger trials are required to compare ACT for PTSD to conventional treatments in order to develop the current evidence base especially as such approaches may be more acceptable to some individuals.

On a local level, services may wish to invest in training so that such approaches can be offered to patients and outcomes, including relapse prevention, can be evaluated clinically. As there are similarities with CBT approaches (the predominant model in NHS psychological therapies provision at present), which have been outlined by Wilson *et al.* (2011) amongst others, such training may be done through well organised professional development programs and special interest groups. In addition, some of approaches will be relatively familiar and may not represent a big change for clinicians using CBT. For instance, cognitive distancing techniques are widely practiced by CBT therapists and such techniques are consistent with ACT cognitive defusion techniques. Clear dissemination of ACT findings may also go some way in encouraging clinicians to use and evaluate these processes clinically.

### **3.5.6 Conclusions**

The present study contributes to the research on the prevalence of trauma history and symptoms in a help seeking clinical sample. Although difficult to generalise outside of the given service, there are indications that screening for trauma history is important and more local and national prevalence research is warranted. The study adds further to the literature on factors that contribute to the development and maintenance of post-trauma symptoms by examining the roles of both cognitive fusion and experiential avoidance as a mediator between trauma history and PTSD symptomatology and/or general psychological functioning. Further research is required to investigate associated changes in these two proposed mechanisms over time and importantly during therapeutic interventions which target these processes. Wider training in ACT and/or other interventions that target these processes is warranted in order to further evaluate the clinical efficacy of such approaches and to provide alternative interventions for individuals who find traditional exposure-based treatments unacceptable.



## Chapter 4: Journal Article

### 4.1 Title Page

#### **Role of Cognitive Fusion and Experiential Avoidance in Trauma Symptoms in an Adult Clinical Population**

(This has been produced according to submission guidelines for; *Clinical Psychology and Psychotherapy*, see Appendix 1)

Short title for running head: Cognitive Fusion and Experiential Avoidance in Trauma Symptoms

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## 4.2 Abstract<sup>1</sup>

Posttraumatic stress disorder (PTSD) is a complex disorder and no one theory can fully explain the development and maintenance of PTSD symptoms. According to Acceptance and Commitment Therapy (ACT) one way of conceptualising such a disorder is that symptoms develop and persist as a result of underlying psychological inflexibility. The ACT model of psychological inflexibility describes ways of responding to contextual cues, two of which, namely experiential avoidance (EA) and cognitive fusion (CF) may be particularly relevant to a disorder such as PTSD which is characterised by re-experiencing, avoidance and hyperarousal symptoms. The current study aimed to examine the role of EA and CF processes in posttraumatic stress symptoms and living consistently with values (valued action) in a clinical sample. Eighty two patients attending an adult psychological therapies service completed the following measures; Cognitive Fusion Questionnaire (CFQ 13), Acceptance and Action Questionnaire (AAQ II), Valued Living Questionnaire (VLQ) and Posttraumatic Stress Diagnostic Scale (PDS). Results indicated that CF and EA were positively correlated with trauma symptom severity and negatively correlated with valued action. Both CF and EA mediated the relationship between number of traumatic events and trauma symptom severity in a simple mediation model. However, a multiple mediation analysis demonstrated that EA over and above CF explained 33 per cent of the variance. In addition, CF and EA jointly had a significant indirect effect on the relationship between trauma history and valued action. The implications of the findings and further directions are discussed.

*Key words:* Trauma history, PTSD symptoms, Experiential avoidance, Cognitive fusion, Valued action, Mediators

Word count: 243

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<sup>1</sup>As with the systematic review, numbering of journal article sections is for the purposes of thesis continuity only.

### 4.3 Introduction

Posttraumatic stress disorder (PTSD) may occur following an overwhelming traumatic event and is characterised by symptoms of re-experiencing, avoidance and hyperarousal (American Psychiatric Association (APA), 1994). It is a chronic disorder associated with impaired psychosocial functioning and psychological distress. Studies have found that exposure to potentially traumatic events is common (60.7 % men, and 51.2 % women; Kessler *et al*, 1995) and that multiple exposure further increases the likelihood of developing PTSD symptoms (Green *et al.*, 2000). However, trauma related symptoms overlap with symptoms of other psychiatric problems such as major depression disorder, anxiety disorders other than PTSD and substance misuse problems (Jacobsen, Southwick & Kosten, 2001). The relationship between PTSD symptoms and comorbid disorders is not clear. It has been shown in a community sample that in the majority of cases, depression and substance misuse problems are secondary to PTSD whilst this is so for around half of comorbid anxiety problems (Kessler *et al*, 1995). Due to the high congruence of symptomatology between disorders, high rates of comorbidity and help seeking issues such as stigma related to disclosure, there is some recognition that many individuals are potentially being treated for depressive (or anxiety symptoms) without the consideration of possible PTSD being present (Campbell *et al.*, 2007).

There are a number of efficacious treatments for PTSD, many of which broadly fall within Cognitive Behavioural Therapy (CBT) approaches, including prolonged exposure, cognitive restructuring and Eye Movement Desensitisation and Reprocessing (EMDR). Cognitive behavioural treatments for PTSD or trauma related symptoms are largely based on the theoretical postulation that in PTSD there is a continued sense of current threat and this arousal is regulated by patterns of avoidance (Ehlers & Clark, 2000). When efforts to avoid or control trauma related experiences such as memories, thoughts or feelings are unsuccessful, emotional numbing plays a role in the development and maintenance of the disorder (Foa *et al.*, 1995a). Consequently, many treatments of choice for pervasive trauma related symptoms have in common an element of exposure to feared traumatic experiences. However, this

may be unacceptable to some individuals due to a requisite focussed engagement with cues related to the trauma which they are unable or unwilling to tolerate. One limitation of such an approach is that there may be a range of emotional responses to trauma other than fear including, disgust, anger, shame or intense sadness, which are not specifically addressed in the theoretical understanding of the disorder (Orsillo & Batten, 2005). Another limitation of such treatments is a tendency to focus on the reduction of re-experiencing and arousal symptoms as an outcome, this may discount the widespread functional impairment associated with the disorder.

Acceptance and commitment therapy has been put forward as potentially a treatment approach which addresses some of these concerns (Orsillo & Batten, 2005). Firstly, ACT specifically targets experiential avoidance with a number of established methods to facilitate experiential willingness. Secondly, ACT addresses the full range of emotional and cognitive responses to private experiences such as flashbacks, memories and thoughts. Thirdly, the core processes of ACT are thought to play a role in psychopathology in general and thus ACT for PTSD is potentially transdiagnostic and could address comorbidity. Finally, ACT emphasises improved functioning and quality of life according to personal values above reduced symptomatology. Readers interested in a summary of the conceptual model and outcomes are directed to Hayes *et al.* (2006).

In the trauma literature, the ACT process of experiential avoidance has been investigated among child sexual assault (CSA) survivors (Batten, Follette & Aban, 2001; Marx & Sloan, 2002) and a more diverse sample including undergraduates and treatment seeking populations (Plumb *et al.*, 2004). Taken together, these studies indicate that experiential avoidance plays a significant role in development and maintenance of post event psychological distress. To date, however, no studies have investigated the role of cognitive fusion which is another core ACT process. With well established cognitive defusion techniques in ACT (and other cognitive approaches) this presents a potentially important therapeutic tool in trauma focused work. See Blackledge (2007) and Luoma and Hayes (2009) for an overview of cognitive defusion techniques. Based on previous findings, the current paper attempts

to assess the role of EA in relation to CF in trauma symptom severity and valued action in a clinical sample. To the author's knowledge, no study to date has investigated the role of cognitive fusion in trauma symptom severity and therefore the proposed study will attempt to address this gap in the literature.

## **4.4 Method**

A proposal of the study was first approved by the University of Edinburgh's Section of Clinical and Health Psychology Research Viability and Ethics process as a viable project. Following this, full ethics approval was granted by the Tayside Committee on Medical Research Ethics and the Tayside Academic Health Sciences Centre Research and Development Office.

### **4.4.1 Design**

A cross-sectional design was used with experienced clinicians administering a pack of questionnaires on a one-off basis. Along with the collection of demographic information, participants were administered four self-report questionnaires measuring experiential avoidance, cognitive fusion, valued action and trauma history along with posttraumatic stress disorder symptomatology.

### **4.4.2 Participants**

A cross-section of English speaking adults attending an outpatient psychological therapies service across a mix of metropolitan and rural areas in Tayside were interviewed by a clinician on an opt-in, voluntary basis. The inclusion criteria for the study were the same as the service criteria and therefore all patients on clinician caseload were eligible. The defined criteria include; individuals in the age range of 16 to 64 years with a diagnosed mild to moderate psychological disorder likely to respond

to a brief, time limited, period of psychological treatment. For example; anxiety disorders including PTSD and obsessive compulsive disorder (OCD); mild to moderate depressive disorders; bulimia with no physical complications. Exclusion criteria included; severe or enduring mental illness; psychological disorder central to offending behaviour; acquired brain injury; problems primarily associated with physical health conditions; primary addiction problems; anorexia nervosa; psychosexual disorders; difficulties due to social factors; and anger management. This was established by clinical interview with experienced psychologists. Of the 119 patients invited to take part, 37 declined representing a response rate of 69 per cent ( $N = 82$ ). All participants were Caucasian, the majority were female (70 %) and the age range of participants was 17 to 64 with a mean age of 37.8 years ( $SD = 12.5$ ).

### **4.4.3 Measures**

#### **4.4.3.1 The Posttraumatic Stress Diagnostic Scale**

The Posttraumatic Stress Diagnostic Scale (PDS: Foa, 1995) is a 49 item, self report questionnaire. It identifies exposure to potentially traumatic events and assesses symptom severity in terms of DSM IV criteria for post traumatic stress disorder. This is a widely used measure with good psychometric properties including high internal consistency of an alpha coefficient of .92 with highly significant test-retest correlation of symptom severity ( $r = 0.83$ ). In addition, this measure has a diagnostic agreement of 82 per cent with another, widely used, clinician administered interview called the Structured Clinical Interview for DSM IV (SCID: Spitzer, 1992). The instrument yields scores for number of symptoms in each DSM IV symptom cluster (B, C, and D), total number of symptoms, symptom severity and level of functional impairment.

#### **4.4.3.2 Cognitive Fusion Questionnaire**

The Cognitive Fusion Questionnaire (CFQ13; Gillanders *et al.*, 2010) is a brief self report measure of 13 questions. It has been developed to measure the main

dimensions of cognitive fusion including believability, entanglement, taking action contrary to thoughts and perspective taking. The CFQ 13 has shown good reliability with a Cronbach's alpha of .89 for the scale across four separate community samples. Preliminary results in clinical samples have also shown good reliability. Convergent validity on related constructs such as distress, mindfulness, thought control strategies and life satisfaction has been well established via correlation analysis with standardised measures. A higher score on this measure indicates greater levels of cognitive fusion.

#### **4.4.3.3 Acceptance and Action Questionnaire**

The Acceptance and Action questionnaire II (AAQ II; Bond *et al.*, in press) is a seven item measure of experiential avoidance which aims to evaluate a person's ability to be present with thoughts and feelings as they arise without needless avoidance or deliberate attempts to change the form or frequency of these events. The AAQ II has demonstrated good construct validity of alpha ranging between .78 and .88 across different samples with an average of .84 overall. This measure has also demonstrated good construct validity through various convergent, predictive and discriminant validity studies with other well validated measures such as the Beck Depression Inventory (BDI-II; Beck, Steer & Brown, 1996), Beck Anxiety Inventory (BAI; Beck & Steer, 1990), the White Bear Suppression Inventory (WBSI; Wegner & Zanalos, 1994) and the Global Severity Index of the Symptom Checklist 90- Revised (SCL-90-R-GSI; DeRogatis, 1992). In addition, test-retest reliability is reported as .81 for three months, and .79 at 12 months, respectively. This is a single factor measure where higher scores indicate greater levels of experiential avoidance.

#### **4.4.3.4 Valued Living Questionnaire**

The Valued Living Questionnaire (VLQ; Wilson *et al.*, 2010) is a two part instrument of ten items in each part assessing valued action. In part 1, the participants rate the importance of ten domains of living on a ten point likert-type scale. Examples of these

domains are family, parenting, intimate relationships, recreation and physical well being. In part two, the participant is asked to rate how consistent their actions have been over the past week in relation to these ten domains using the same scale. The reliability for the importance and consistency subscales is reported as good, with a Cronbach's alpha of .77 and .75 respectively. Additionally, construct validity has been adequately confirmed by factor analysis.

#### **4.4.3.5 Demographic information**

Demographic information including age, gender, ethnicity, postcode and clinician rated diagnosis was collected. The postcodes were used to evaluate the role of socioeconomic status using the Scottish Index of Multiple Deprivation (SIMD) decile point scale. This is a scale where 1 indicates the most deprived through to 10 which represents the least deprived areas in Scotland (Scottish Government, 2009).

#### **4.4.4 Procedure**

Recruitment was performed via clinicians who were asked to approach all ongoing treatment cases unless judged that this would adversely interfere with patient care. Due to the nature of the study, no new referrals or assessment-only cases were approached. Potential participants were invited to take part by means of an opt-in slip and participant information sheet. Once informed consent had been obtained, a pack of questionnaires completed with a clinician. The clinician responsible for the treatment of participants provided a clinician rated diagnosis.

#### **4.4.5 Statistical Analysis**

Data from questionnaires were entered into a statistical package called Predictive Analytics SoftWare (PASW) previously known as Statistical Package for the Social Sciences (SPSS) version 18.0 for windows. The research employed a mixed statistical



methodology. Firstly, data were analysed for missing data and normality followed by descriptive statistics to investigate the prevalence of trauma history and PTSD symptoms in the sample. Pearson's correlations were conducted to investigate associations between trauma history, cognitive fusion, experiential avoidance, valued action, and trauma symptoms severity. This was followed by mediation analyses using bootstrapping to explore the statistical influence of proposed mediators using the Preacher and Hayes (2008) method. Mediation effects were computed using bias corrected 95% confidence intervals and the recommended 5,000 bootstrap samples (Preacher & Hayes, 2004). A mediation effect is significant if the upper and lower bounds of the bias corrected confidence intervals do not contain zero i.e. the mediation effect is not zero at the set confidence level ( $p < .05$ ).

## 4.5 Results

Of 82 participants recruited, 73 reported exposure to one or more traumatic event (89%). The results below are based on the population with a trauma history of which 70% were female and all were Caucasian. Using the PDS as a screen for PTSD, 57.5%<sup>2</sup> of the sample met full DSM-IV criteria. Further sample demographics including age and the means, standard deviation and ranges of the scores for the variables of interest are provided in Table 15.

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<sup>2</sup> This figure is different to the 51% reported in the empirical study as for the journal article the figure pertains to the trauma history only sample as compared to the whole sample in the previous section.

*Table 15: Sample demographics with the means, standard deviations and range from the total scores of measures used*

	Mean	SD	Range
Age	39.22	12.30	17-64
CFQ13	58.59	10.06	31-78
AAQ II	33.03	9.45	11-49
VLQ	43.37	17.58	3-82
PDS (number of traumatic events)	2.95	1.62	1-7
PDS (symptom severity scores)	18.14	12.01	0-48

*Note:* CFQ = Cognitive Fusion Questionnaire; AAQ = Acceptance and Commitment Questionnaire; VLQ = Valued Living Questionnaire; PDS = Posttraumatic Stress Diagnostic Scale

Following sample distribution checks, preliminary analyses on possible gender differences and covariates revealed no significant difference (95% confidence) between the groups in terms of age, SIMD code, number of traumatic events, PDS number of trauma symptoms, PDS trauma symptom severity or the mean total scores on the CFQ, AAQ II and VLQ using independent samples *t*-tests. Additionally, gender, age and SIMD code were not significantly correlated with any of the independent or dependent variables used in the analyses and were therefore excluded as possible covariates.

Seventy five percent of the sample reported exposure to multiple traumatic events. The most common event was life-threatening illness of self or others and included sudden or traumatic death of someone else. Table 16 outlines the percentage of participants endorsing various events and which were identified as most upsetting or traumatic.

*Table 16: Percentage of the sample endorsing various traumatic events and the percentage who indentified particular events as the most upsetting*

	% Endorsing Event	% Most Upsetting
Serious Accident, Fire, or Explosion	29.3	11.0
Natural Disaster	3.7	0.0
Non-sexual Assault by Family or Someone Known	32.9	9.6
Non-sexual Assault by a Stranger	35.4	8.2
Sexual Assault by Family or Someone Known	31.7	24.7
Sexual Assault by a Stranger	8.5	4.1
Military Combat or a War Zone	3.7	0.0
Sexual Contact under 18 with person 5+ older	39	1.4
Imprisonment	1.2	0.0
Torture	8.5	2.7
Life-threatening Illness/Sudden Death	48.8	32.9
Other Traumatic Event	19.5	5.5

*Note:* Percentages for 'Endorsing Event' add up to greater than 100 due to multiple traumatic events reported by some participants. Other Traumatic Events category primarily include termination of a pregnancy and being a carer for a person with severe and enduring mental health problems.

The correlations between cognitive fusion, experiential avoidance, consistency of valued action, number of traumatic events and posttraumatic stress symptom severity are summarised in Table 17 below.

*Table 17: Correlations between cognitive fusion, experiential avoidance, valued action, trauma exposure and symptom severity*

	1	2	3	4	5
1. CFQ 13	1				
2. AAQ II	.78**	1			
3. VLQ	-.41**	-.46**	1		
4. PDS (number of traumatic events)	.36**	.40**	-.19	1	
5. PDS (symptom severity scores)	.46**	.55**	-.35**	.37**	1

*Note:* CFQ = Cognitive Fusion Questionnaire; AAQ = Acceptance and Commitment Questionnaire; VLQ = Valued Living Questionnaire; PDS = Posttraumatic Stress Diagnostic Scale. \*\*  $p < 0.01$  (2-tailed)

The simple mediation model results revealed that both cognitive fusion, as measured by the CFQ (.3, 2.02), and experiential avoidance, measured by the AAQ II (.54, 2.63) were significant mediators in the relationship between trauma history and trauma symptom severity at the bias corrected confidence interval of 95%. However when examined together, as shown in Figure 7 below, the bias corrected confidence interval for experiential avoidance remained significant (.30, 2.83) whilst the result for cognitive fusion was no longer significant (-.76, 1.02).

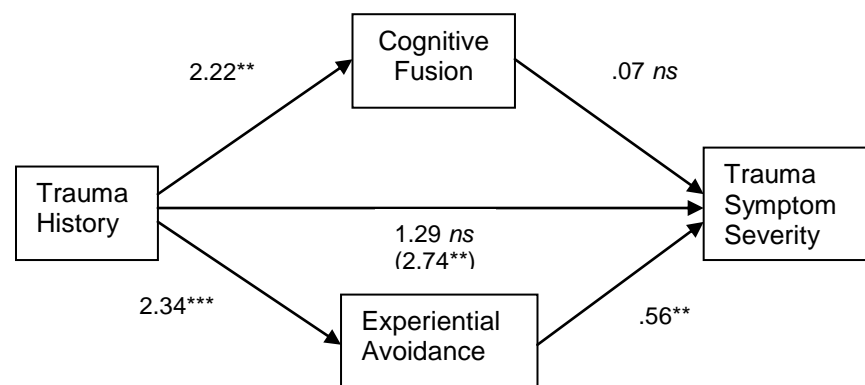


Figure 7: Multiple mediation regression model depicting the role of cognitive fusion and experiential avoidance in mediating effect of trauma history and posttraumatic stress symptom severity

Note: All paths are unstandardised coefficients. Those inside parentheses are path effects prior to proposed mediators. \*\*  $p < .01$ , \*\*\*  $p < .001$ , ns = not significant

The multiple mediation model accounted for 33 per cent of the amount of variance in trauma symptom severity ( $R^2 = .33$ ) and fully mediated the relationship i.e. the effect of the independent variable trauma history on trauma symptom severity was no longer significant. Experiential avoidance mediated the relationship between number of traumatic experiences and trauma symptom severity over and above a shared mediation role with cognitive fusion in the sample.

As valued action was not correlated with number of traumatic experiences the next model tested for an indirect effect of trauma history on valued action through either fusion, experiential avoidance or both. The multiple variable indirect effect model is represented in Figure 8 below. An indirect effect refers to a linking mechanism that ties two uncorrelated variables together through a significant relationship with the proposed linking variable(s). See Mathieu and Taylor (2006) for an in-depth discussion on the distinction between indirect and mediation effects.

Bias corrected confidence intervals (BC CI) for cognitive fusion did not contain zero (-3.0,-.53) therefore there was a significant indirect effect of trauma history on valued action through cognitive fusion. A similar effect in the sample was found for experiential avoidance (-3.8, -.72). For the combined indirect effects model, the total BC CI (-4.1, -.78) of fusion and experiential avoidance did not contain zero and therefore can be accepted as a significant indirect effect at the 95 % confidence level. However, the individual fusion and experiential avoidance BC CI did contain zero and were not significant on their own in the multiple indirect effect model.

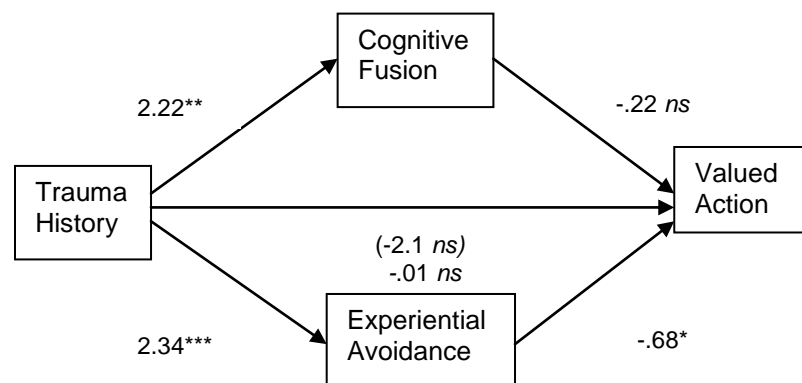


Figure 8: Diagrams of regression analyses depicting the indirect role of trauma history on valued action through cognitive fusion and experiential avoidance

Note: All paths are unstandardised coefficients. Those inside parentheses are path effects prior to proposed mediator. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ , *ns* = not significant

## 4.6 Discussion

The current study investigated the role of cognitive fusion and experiential avoidance in post event trauma symptoms and living in accordance with personal values in a clinical sample. The prevalence of trauma history in the sample was in line with the highest epidemiological rates reported in the United States (Breslau *et al.*, 1998). This is an important finding with significant service implications given the lack of local or national epidemiological research on PTSD in the United Kingdom. Results indicated that higher levels of EA and CF are associated with more severe PTSD symptom severity as well as lower levels of valued action. In addition, CF and EA individually mediated the relationship between trauma history and symptom severity. However, when entered into the mediation model together, EA was the mechanism which explained the mediation relationship alone. A further finding was that CF and EA together played an indirect role in the trauma history and valued action relationship.

A possible explanation may be that the conditions for mediational inferences were not fully met in the theoretical model tested. For instance, an important precondition for mediation is that relationships depicted should unfold in a sequence (Mathieu & Taylor, 2006). That is, the antecedent (in this case trauma history) should precede the mediators (CF and/or EA), which in turn should precede the criterion (symptom severity). Hayes *et al.*, (2006) noted that longitudinal research using the AAQ shows that the level of EA has an impact on mental health and not the reverse. With regards to CF, a study has shown that CF at time 1 predicted scores on the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) one month later in a community sample after controlling for the HADS scores at time 1 (Gillanders *et al.*, 2010). On the basis of such findings, CF could also be taken to precede the criterion of trauma symptom severity in the present model. However a more likely explanation, in terms of preconditions for mediation, is that currently there are measurement related issues of convergent and discriminant validity between the AAQ II and CFQ 13 and both are effectively tapping into the same domain underlying the mediation role (Mathieu & Taylor, 2006). In the ACT model the constructs of CF and EA are

interrelated and CF is said to support EA which may go some way to explain this finding (Hayes *et al.*, 2006).

This explanation is backed up by the finding that CF and EA are highly correlated ( $r = .78$ ) in the sample indicating possible multicollinearity in the multiple mediation model. In earlier studies, the correlation between CFQ 13 and AAQII was around .69 suggesting that the two concepts of cognitive fusion and experiential avoidance are related but not synonymous (Dempster *et al.*, 2011). However, this correlation did not include findings from clinical samples. The figure was recently revised to .72 when data from clinical samples was included. However, further data were required in order to perform a confirmatory factor analysis in a clinical sample according to a datasheet produced by Gillanders, Bolderston & Bond (2011) (received by personal communication with first author, 11 April, 2011). As a result, the findings from the present study would contribute to this process.

Field (2005) has suggested that a correlation of .80 or larger is a general rule of thumb to identify multicollinearity and the correlation between the AAQ II and CFQ 13 is approaching that figure. Multicollinearity is problematic in mediation models in that it limits the measure of multiple correlation ( $R$ ), leads to unstable unique estimates of regression coefficients and difficulty in assessing the importance of each variable (Field, 2005). As a result, the present study cannot make specific inferences about the importance of either variable in the mediation models tested over and above what appears to be a shared construct of experiential avoidance. With the AAQ II it has been suggested that the score describes both psychological flexibility and experiential avoidance (Bond *et al.*, in press). However in the ACT model, psychological flexibility involves six core processes including experiential avoidance and cognitive fusion (Hayes *et al.*, 1996). Consequently, the construct validity of the AAQ II and CFQ 13 as an isolated measure of experiential avoidance and cognitive fusion respectively is uncertain.

A previous study by Marx & Sloan (2002) demonstrated that avoidance (as measured by the AAQ) mediated the relationship between a history of child sexual abuse (CSA)

and psychological impairment ( $R^2 = .30$ ). The present study found a similar simple mediating effect of experiential avoidance on trauma symptom severity ( $R^2 = .33$ ). The outcome measure in the Marx & Sloan (2002) study was the Global Severity Index of the Symptom Checklist 90- Revised (SCL-90-R; DeRogatis, 1992) whilst the present study used a trauma specific outcome (PDS). Two further studies supported the notion that the AAQ is a better predictor of general psychological distress than specific trauma symptoms (Plumb, Orsillo & Luterek, 2004; Tull *et al.*, 2004). Such findings may indicate that in the present sample, the PDS symptom severity scale provided a good measure of general psychological distress. This is perhaps not surprising as PTSD symptoms are known to be associated with poor psychological outcomes in general (Kessler *et al.*, 1995; Nemeroff *et al.*, 2006). However, such similarities may indicate that the symptom severity score on the PDS reflects general distress, co-morbidity and associated functional impairment rather than PTSD or that the ACT processes are mechanisms involved in all psychopathology. Other known methodological difficulties with self report measures and the cross sectional design of the current study do not allow for causal inferences to be made.

Despite these limitations, both cognitive fusion and experiential avoidance, as measured by the CFQ 13 and AAQ II respectively, were correlated with trauma symptom severity and a decrease in valued action. If these two measures are shown to be sensitive to change over time, especially in response to respective fusion or acceptance interventions, there is much scope to design studies which can unpick this relationship and to conduct further factor analysis. This could be accomplished by using the CFQ 13 alongside the AAQ II in future ACT research as this may help to isolate which items measure fusion specifically and which tap into experiential avoidance. The present findings support previous claims that it is not traumatic experiences *per se* which lead to poor outcome, but rather, the attempt to control (suppress or regulate) private internal experiences which plays an important part in the outcome. Due to multicollinearity discussed above, the role of fusion is less clear. However, cognitive fusion may be contributing to pathology as it has the potential to lead to experiential avoidance and trap a person in the experiences of a traumatic past. Further research is required in order to establish relative changes in both proposed



mechanisms over time during ACT interventions to explore the relationship between both processes more fully.

The results of the present study have important implications for the treatment of PTSD symptoms in primary care psychology services. Support is provided for the notion that experiential avoidance along with cognitive fusion may be core psychological processes responsible for the maintenance of psychological distress following exposure to trauma, suggesting that ACT consistent interventions are indicated. Such interventions may also be transdiagnostic and deal with both trauma symptoms and comorbidity such as depression. In addition, approaches to reducing experiential avoidance and defusion strategies may be more acceptable to some individuals than fear reduction exposure based techniques of traditional treatment treatments such as prolonged exposure and EMDR.

With emerging evidence from case studies reporting effective ACT for PTSD (e.g. Batten & Hayes, 2005; Orsillo & Batten, 2005; Twohig, 2009) the above findings are promising and support a role for ACT in treating trauma related problems in primary care psychology services. The findings also suggest that further research into the distinction between cognitive fusion and experiential avoidance may go some way in advancing our understanding of trauma related psychopathology.

#### **ACKNOWLEDGEMENTS**

The author is grateful to her thesis supervisors, Prof Kevin Power and Dr David Gillanders, for their helpful comments and support.

#### **DECLARATION OF INTEREST**

None.

## 4.7 References

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# Appendix 1 Clinical Psychology and Psychotherapy Author Guidelines

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Edited By: Paul Emmelkamp and Mick Power

Online ISSN: 1099-0879

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**File types.** Preferred formats for the text and tables of your manuscript are .doc, .rtf, .ppt, .xls. **LaTeX** files may be submitted provided that an .eps or .pdf file is provided **in addition** to the source files. Figures may be provided in .tiff or .eps format.

**Please note:** This journal does not accept Microsoft Word 2007 documents at this time. Please use Word's "Save As" option to save your document as a .doc file type. If you try to upload a Word 2007 document in ManuscriptCentral you will be prompted to save .docx files as **.doc** files.

## **NEW MANUSCRIPT**

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## **REVISED MANUSCRIPT**

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LaTeX users. When submitting your revision you must still upload a single .pdf that you have generated from your revised source files. You must use the File Designation "Main Document" from the dropdown box. In addition you must upload your TeX source files. For all your source files you must use the File Designation "Supplemental Material not for review". Previous versions of uploaded documents must be deleted. If your manuscript is accepted for publication we will use the files you upload to typeset your article within a totally digital workflow.

## **COPYRIGHT AND PERMISSIONS**

Authors **must** sign, scan and upload to the online system:

- To enable the publisher to disseminate the author's work to the fullest extent, the author must sign a [Copyright Transfer Agreement](#) transferring copyright in the article from the author to the publisher. Without this we are unable to accept the submission. A copy of the agreement to be used (which may be photocopied) can be found on the *Wiley InterScience* website and through links in the online submission system.
- Permission grants - if the manuscript contains extracts, including illustrations, from other copyright works (including material from on-line or intranet sources) it is the author's responsibility to obtain written permission from the owners of the publishing rights to reproduce such extracts using the [Wiley Permission Request Form](#) .

The Copyright Transfer Agreement Form and the Permissions Request Form should be uploaded as “Supplementary files not for review” with the online submission of your article.

If you do not have access to a scanner, further instructions will be given to you after acceptance of the manuscript.

Submission of a manuscript will be held to imply that it contains original unpublished work and is not being submitted for publication elsewhere at the same time.

**Title and Abstract Optimisation Information.** As more research is read online, the electronic version of articles becomes ever more important. In a move to improve search engine rankings for individual articles and increase readership and future citations to Clinical Psychology and Psychotherapy at the same time please visit [Optimizing Your Abstract for Search Engines](#) for guidelines on the preparation of keywords and descriptive titles.

**Manuscript style.** The language of the journal is (British) English. All submissions must have a title, be printed on one side of A4 paper with numbered pages, be double-line spaced and have a 3cm wide margin all around. Illustrations and tables must be printed on separate sheets, and not incorporated into the text.

## MANUSCRIPT STYLE

The language of the journal is English. 12-point type in one of the standard fonts: Times, Helvetica, or Courier is preferred. It is not necessary to double-line space your manuscript. Tables must be on separate pages after the reference list, and not be incorporated into the main text. Figures should be uploaded as separate figure files.

- During the submission process you must enter the full title, short title of up to 70 characters and names and affiliations of all authors. Give the full address, including email, telephone and fax, of the author who is to check the proofs.
- Include the name(s) of any **sponsor(s)** of the research contained in the paper, along with **grant number(s)** .
- Enter an **abstract** of up to 250 words for all articles [except book reviews]. An abstract is a concise summary of the whole paper, not just the conclusions, and is understandable without reference to the rest of the paper. It should contain no citation to other published work.
- All articles should include a **Key Practitioner Message** — 3-5 bullet points summarizing the relevance of the article to practice.
- Include up to six **keywords** that describe your paper for indexing purposes.

**Research Articles:** Substantial articles making a significant theoretical or empirical contribution.

**Reviews:** Articles providing comprehensive reviews or meta-analyses with an emphasis on clinically relevant studies.

**Assessments:** Articles reporting useful information and data about new or existing measures.

**Practitioner Reports:** Shorter articles that typically contain interesting clinical material.

**Book Reviews:** Published on invitation only. Critical summaries of recent books that are of general interest to readers of the journal.

**Reference style .** The APA system of citing sources indicates the author's last name and the date, in parentheses, within the text of the paper.

**A. A typical citation of an entire work consists of the author's name and the year of publication .**

Example: Charlotte and Emily Bronte were polar opposites, not only in their personalities but in their sources of inspiration for writing (Taylor, 1990). Use the last name only in both first and subsequent citations, except when there is more than one author with the same last name. In that case, use the last name and the first initial.

**B. If the author is named in the text, only the year is cited .**

Example: According to Irene Taylor (1990), the personalities of Charlotte. . .

**C. If both the name of the author and the date are used in the text, parenthetical reference is not necessary .**

Example: In a 1989 article, Gould explains Darwin's most successful. . .

**D. Specific citations of pages or chapters follow the year .**

Example: Emily Bronte "expressed increasing hostility for the world of human relationships, whether sexual or social" (Taylor, 1988, p. 11).

**E. When the reference is to a work by two authors, cite both names each time the reference appears .**

Example: Sexual-selection theory often has been used to explore patters of various insect matings (Alcock & Thornhill, 1983) . . . Alcock and Thornhill (1983) also demonstrate. . .

**F. When the reference is to a work by three to five authors, cite all the authors the first time the reference appears. In a subsequent reference, use the first author's last name followed by *et al* . (meaning "and others") .**

Example: Patterns of byzantine intrigue have long plagued the internal politics of community college administration in Texas (Douglas *et al* ., 1997) When the reference

is to a work by six or more authors, use only the first author's name followed by *et al.* in the first and all subsequent references. The only exceptions to this rule are when some confusion might result because of similar names or the same author being cited. In that case, cite enough authors so that the distinction is clear.

**G. When the reference is to a work by a corporate author, use the name of the organization as the author .**

Example: Retired officers retain access to all of the university's educational and recreational facilities (Columbia University, 1987, p. 54).

**H. Personal letters, telephone calls, and other material that cannot be retrieved are not listed in References but are cited in the text .**

Example: Jesse Moore (telephone conversation, April 17, 1989) confirmed that the ideas. . .

**I. Parenthetical references may mention more than one work, particularly when ideas have been summarized after drawing from several sources. Multiple citations should be arranged as follows .**

Examples:

- List two or more works by the same author in order of the date of publication: (Gould, 1987, 1989)
- Differentiate works by the same author and with the same publication date by adding an identifying letter to each date: (Bloom, 1987a, 1987b)
- List works by different authors in alphabetical order by last name, and use semicolons to separate the references: (Gould, 1989; Smith, 1983; Tutwiler, 1989).

All references must be complete and accurate. Where possible the [DOI](#) for the reference should be included at the end of the reference. Online citations should include date of access. If necessary, cite unpublished or personal work in the text but do not include it in the reference list. References should be listed in the following style:

**Journal Article**

Gardikiotis, A., Martin, R., & Hewstone, M. (2004). The representation of majorities and minorities in the British press: A content analytic approach. *European Journal of Social Psychology*, 34 , 637-646. DOI: 10.1002/ejsp.221

**Book**

Paloutzian, R. F. (1996). *Invitation to the psychology of religion* (2nd ed.). Boston: Allyn and Bacon.

### **Book with More than One Author**

Natarajan, R., & Chaturvedi, R. (1983). *Geology of the Indian Ocean* . Hartford, CT: University of Hartford Press.

Hesen, J., Carpenter, K., Moriber, H., & Milsop, A. (1983). *Computers in the business world* . Hartford, CT: Capital Press. and so on.

The abbreviation *et al.* is not used in the reference list, regardless of the number of authors, although it can be used in the text citation of material with three to five authors (after the initial citation, when all are listed) and in all parenthetical citations of material with six or more authors.

### **Web Document on University Program or Department Web Site**

Degelman, D., & Harris, M. L. (2000). *APA style essentials* . Retrieved May 18, 2000, from Vanguard University, Department of Psychology Website:  
[http://www.vanguard.edu/faculty/ddegelman/index.cfm?doc\\_id=796](http://www.vanguard.edu/faculty/ddegelman/index.cfm?doc_id=796)

### **Stand-alone Web Document (no date)**

Nielsen, M. E. (n.d.). *Notable people in psychology of religion* . Retrieved August 3, 2001, from <http://www.psywww.com/psyrelig/psyrelpr.htm>

### **Journal Article from Database**

Hien, D., & Honeyman, T. (2000). A closer look at the drug abuse-maternal aggression link. *Journal of Interpersonal Violence*, *15* , 503-522. Retrieved May 20, 2000, from ProQuest database.

### **Abstract from Secondary Database**

Garrity, K., & Degelman, D. (1990). Effect of server introduction on restaurant tipping. *Journal of Applied Social Psychology*, *20* , 168-172. Abstract retrieved July 23, 2001, from PsycINFO database.

### **Article or Chapter in an Edited Book**

Shea, J. D. (1992). Religion and sexual adjustment. In J. F. Schumaker (Ed.), *Religion and mental health* (pp. 70-84). New York: Oxford University Press.

\*The Digital Object Identifier (DOI) is an identification system for intellectual property in the digital environment. Developed by the International DOI Foundation on behalf of the publishing industry, its goals are to provide a framework for managing intellectual content, link customers with publishers, facilitate electronic commerce, and enable automated copyright management.

**Illustrations.** Upload each figure as a separate file in either .tiff or .eps format, the figure number and the top of the figure indicated. Compound figures e.g. 1a, b, c



should be uploaded as one figure. Grey shading and tints are not acceptable. Lettering must be of a reasonable size that would still be clearly legible upon reduction, and consistent within each figure and set of figures. Where a key to symbols is required, please include this in the artwork itself, not in the figure legend. All illustrations must be supplied at the correct resolution:

- Black and white and colour photos - 300 dpi
- Graphs, drawings, etc - 800 dpi preferred; 600 dpi minimum
- Combinations of photos and drawings (black and white and colour) - 500 dpi

The cost of printing **colour** illustrations in the journal will be charged to the author. The cost is approximately £700 per page. If colour illustrations are supplied electronically in either **TIFF** or **EPS** format, they **may** be used in the PDF of the article at no cost to the author, even if this illustration was printed in black and white in the journal. The PDF will appear on the *Wiley Online Library* site.

## **POST ACCEPTANCE**

**Further information.** For accepted manuscripts the publisher will supply proofs to the corresponding author prior to publication. This stage is to be used only to correct errors that may have been introduced during the production process. Prompt return of the corrected proofs, preferably within two days of receipt, will minimise the risk of the paper being held over to a later issue. Once your article is published online no further amendments can be made. Free access to the final PDF offprint or your article will be available via author services only. Please therefore sign up for author services if you would like to access your article PDF offprint and enjoy the many other benefits the service offers

**Author Resources.** Manuscript now accepted for publication?

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- Article Tracking
- E-mail Publication Alerts
- Personalization Tools

**Cite EarlyView articles.** To link to an article from the author's homepage, take the DOI (digital object identifier) and append it to "http://dx.doi.org/" as per following example:

DOI 10.1002/hep.20941, becomes http://dx.doi.org/10.1002/hep.20941.

## Appendix 2 List of Primary Authors contacted via email

Anouk Grubaugh

Caron Zlotnick

Deborah Maia

\*Gordon Asmundson

Hans-Bernd Rothenhäusler

\*J Gayle Beck

\*Jacques Mylle

\*Jonathan Davidson

\*Judith Cukor

\*Karen Gillock

Laurel Franklin

Lynda Matthews

Maeng Je Cho

\*Man Cheung Chung

\*Matthias Schützwohl

Murray Stein

Naomi Breslau

Rebecca Shelby

\*Ulrich Schnyder

Urs Hepp

\* Responded

## Appendix 3 Quality Assessment Sheet developed for Systematic Review

**Study:**

1. Clear group definition/method for the assignment of groups	0	1	2
2. Groups comparable / extraneous variables are controlled for	0	1	2
3. Confounding factors / comorbid depression	0	1	2
4. Design: retrospective / prospective	0	1	2
5. Prevalence: Current / lifetime / both	0	1	2
6. Functional impairment: design / method / outcome measure	0	1	2
7. Primary outcome measures: clinician rated / self report / both	0	1	2
8. Statistical analysis: a) OR / CI / SE			
b) Power analysis : Y / N	0	1	2
9. Generalisability, limitations & implications are clearly discussed	0	1	2

Average:

**Overall rating:**            **0**        **1**        **2**

OR = Odds Ratio

CI = Confidence Interval

SE = Standard Error

SS = Sample Size

## Appendix 4 Research Ethics Approval



### East of Scotland Research Ethics Service

#### Tayside Committee on Medical Research Ethics B

Research Ethics Office  
Tayside Academic Health Sciences Centre  
Ninewells Hospital & Medical School  
Residency Block, Level 3  
George Pirie Way  
Dundee  
DD1 9SY

Ms Penelope Noel  
94 Main Street  
Invergowrie  
DD2 5BE

Date: 16 February 2011  
Your Ref:  
Our Ref: LR/11/S1402/1  
Enquiries to: Mrs Lorraine Reilly  
Extension: Ninewells extension 40099  
Direct Line: 01382 740099  
Email: [Lorraine.reilly@nhs.net](mailto:Lorraine.reilly@nhs.net)

Dear Ms Noel

**Full title of study:** Nature and extent of Post Traumatic Stress Disorder symptoms presenting in an Adult Psychological Therapies Service  
**REC reference number:** 11/S1402/1

Thank you for your letter of 31 January 2011, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information was considered by a sub-committee of the REC at a meeting held on 11 February 2011. A list of the sub-committee members is attached.

#### Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

#### Ethical review of research sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

#### Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

For NHS research sites only, management permission for research ("R&D approval") should be obtained from the relevant care organisation(s) in accordance with NHS research governance arrangements. Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at <http://www.rdforum.nhs.uk>.



Where the only involvement of the NHS organisation is as a Participant Identification Centre (PIC), management permission for research is not required but the R&D office should be notified of the study and agree to the organisation's involvement. Guidance on procedures for PICs is available in IRAS. Further advice should be sought from the R&D office where necessary.

Sponsors are not required to notify the Committee of approvals from host organisations.

**It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).**

#### Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	Version	Date
Protocol	1	21 November 2010
Response to Request for Further Information		31 January 2011
Investigator CV		09 December 2010
Questionnaire: CORE		
Questionnaire: CFQ13		
Questionnaire: AAG-2		
Questionnaire: Valued Living		
CV - David Gillanders		31 January 2011
Participant Information Sheet	2	28 January 2011
REC application		07 December 2010
Participant Consent Form	2	28 January 2011
Questionnaire: Test Booklet		
Evidence of insurance or indemnity		01 August 2010
Covering Letter		06 December 2010
Reference List		
Opt-In Slip	1	28 January 2011

#### Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

#### After ethical review

Now that you have completed the application process please visit the National Research Ethics Service website > After Review

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

The attached document "*After ethical review – guidance for researchers*" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:



- Notifying substantial amendments
- Adding new sites and investigators
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

We would also like to inform you that we consult regularly with stakeholders to improve our service. If you would like to join our Reference Group please email [referencegroup@nres.npsa.nhs.uk](mailto:referencegroup@nres.npsa.nhs.uk).

<b>11/S1402/1</b>	<b>Please quote this number on all correspondence</b>
-------------------	---

Yours sincerely

  
 Mrs Sandra Forbes  
 Chair

Enclosures: List of names and professions of members who were present at the meeting and those who submitted written comments  
 "After ethical review – guidance for researchers"

Copy to: Miss Gemma Watson, University of Edinburgh  
 NHS Tayside R&D Office

**Tayside Committee on Medical Research Ethics B**

**Attendance at Sub-Committee of the REC meeting on 11 February 2011**

**Committee Members:**

Name	Profession	Present	Notes
Mrs Sandra Forbes	Lecturer in Nursing	Yes	Chair
Dr Carol MacMillan	Consultant in Intensive Care Medicine & Anaesthesia	Yes	Vice-chair

**Also in attendance:**

Name	Position (or reason for attending)
Mrs Lorraine Reilly	Co-ordinator Committee B

## Appendix 5 Research and Development Management Approval



24 February 2011

Ms Penelope Noel  
Trainee Clinical Psychologist  
94 Main Street  
INVERGOWRIE  
DD2 5BE

Dear Ms Noel,

### **R & D MANAGEMENT APPROVAL - TAYSIDE**

**Title: Nature and extent of Post Traumatic Stress Disorder symptoms in an Adult Psychological Therapies Service.**

**Chief Investigator: Ms Penelope Noel      Principal Investigator: Ms Penelope Noel**

**Tayside Ref: 2010PZ05      NRS Ref: N/A**

**REC Ref: 11/S1402/1**

**EudraCT Ref: N/A      CTA Ref: N/A**

**Sponsor: University of Edinburgh**

**Funder: Unfunded**

Many thanks for your application to carry out the above project here in NHS Tayside. I am pleased to confirm that the project documentation (as outlined below) has been reviewed, registered and Management Approval has been granted for the study to proceed locally in Tayside.

Approval is granted on the following conditions:-

- ALL Research must be carried out in compliance with the Research Governance Framework for Health & Community Care, Health & Safety Regulations, data protection principles, statutory legislation and in accordance with Good Clinical Practice (GCP).
- All amendments to be notified to TASC R & D Office.
- All local researchers must hold either a Substantive Contract, Honorary Research Contract, Honorary Clinical Contract or Letter of Access with NHS Tayside where required ([http://www.nihr.ac.uk/systems/Pages/systems\\_research\\_passports.aspx](http://www.nihr.ac.uk/systems/Pages/systems_research_passports.aspx)).
- TASC R & D Office to be informed of change in Principal Investigator, Chief Investigator or any additional research personnel locally.
- Notification to TASC R & D Office of any change in funding.

Version 2 – 26/11/10

- As custodian of the information collated during this research project you are responsible for ensuring the security of all personal information collected in line with NHS Scotland IT Security Policies, until destruction of this data.
- Recruitment numbers on a quarterly basis to be reported to TASC R & D Office.
- Annual reports are required to be submitted to TASC R & D Office with the first report due 12 months from date of issue of this management approval letter and at yearly intervals until completion of the study.
- Notification of early termination within 15 days or End of Trial within 90 days followed by End of Trial Report within 1 year to TASC R & D Office.
- You may be required to assist with and provide information in regard to audit and monitoring of study.

Please note you are required to adhere to the conditions, if not, NHS management approval may be withdrawn for the study.

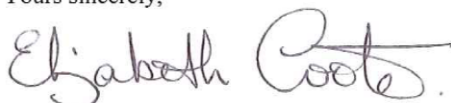
#### Approved Documents

Document	Version	Date
IRAS SSI Form (68963/171837/6/894/85747/199231)		07/12/10
IRAS R&D Form (68963/171824/14/6)		07/12/10
Protocol	1	21/11/10
Reference List		
PIS	2	28/01/11
Consent Form	2	28/01/11
Opt-In Slip	1	28/01/11
CORE		
AAQ-2		
Valued Living Questionnaire		
CFQ13		
PDS Test Booklet		
IRAS REC Form (68963/172115/1/91)		07/12/10
Sponsor Letter – University of Edinburgh		15/12/10
Insurance Certificate – University of Edinburgh		13/09/10
CV – Penelope Noel		09/12/10
CV – David Gillanders		31/01/11

May I take this opportunity to wish you every success with your project.

Please do not hesitate to contact TASC R & D Office should you require further assistance.

Yours sincerely,



Elizabeth Coote  
R&D Manager



Tayside medical Science Centre (TASC)  
Ninewells Hospital & Medical School  
TASC Research & Development Office  
Residency Block, Level 3  
George Pirie Way  
Dundee DD1 9SY  
Email: liz.coote@nhs.net  
Tel: 01382 496536 Fax: 013812 496207

c.c. Dr David Gillanders  
Professor Keith Power  
Tayside Committee on Medical Research Ethics B  
Sponsor Representative – Ms Gemma Watson

---

## Appendix 6 Correspondence from Research and Ethics Committee



### East of Scotland Research Ethics Service

#### Tayside Committee on Medical Research Ethics B

Research Ethics Office  
Tayside Academic Health Sciences Centre  
Ninewells Hospital & Medical School  
Residency Block, Level 3  
George Pirie Way  
Dundee  
DD1 9SY

Ms Penelope Noel  
94 Main Street  
Invergowrie  
Perth and Kinross  
DD2 5BE

Date: 25 January 2011  
Your Ref:  
Our Ref: LR/11/S1402/1  
Enquiries to: Mrs Lorraine Reilly  
Extension: Ninewells extension 40099  
Direct Line: 01382 740099  
Email: [Lorraine.reilly@nhs.net](mailto:Lorraine.reilly@nhs.net)

Dear Ms Noel

**Full title of study:** Nature and extent of Post Traumatic Stress Disorder symptoms presenting in an Adult Psychological Therapies Service

**REC reference number:** 11/S1402/1

The Research Ethics Committee reviewed the above application at the meeting held on 14 January 2011. Thank you and Professor Power for attending to discuss the study.

#### Documents reviewed

The documents reviewed at the meeting were:

Document	Version	Date
Protocol	1	21 November 2010
Investigator CV		09 December 2010
Questionnaire: Test Booklet		
Evidence of insurance or indemnity		01 August 2010
Participant Information Sheet	1	24 November 2010
CV - Dr David Gillanders		
Participant Consent Form	1	24 November 2010
REC application		07 December 2010
Reference List		
Covering Letter		06 December 2010
Questionnaire: CORE		
Questionnaire: CFQ13		
Questionnaire: AAG-2		
Questionnaire: Valued Living		



## Provisional opinion

The Committee is unable to give an ethical opinion on the basis of the information and documentation received so far. Before confirming its opinion, the Committee requests that you provide the further information set out below.

The Committee delegated authority to confirm its final opinion on the application to A meeting of the sub-committee of the REC.

## Further information or clarification required

The following points require to be addressed by letter and submission of revised documentation where requested. **Please note that there is no requirement to amend your application form.**

1. Regarding the application form:
  - A5-1 Ref.Number Description – ‘East of Scotland Research Ethics Service’ should read ‘Tayside Committee on Medical Research Ethics B’.
  - Please clarify what the timeframe is for handing out Participant Information Sheets and taking consent?
  - A18 – states that questionnaires will be completed during an arranged time. Please clarify what it meant by this.
  - Regarding A50 – please give details, or justify why the research will not be registered on a public database.
2. Regarding the Participant Information Sheet (PIS):
  - The Committee felt an opt-in slip should be attached to the Participant Information Sheet for participants to complete and return if they wish to take part in the study.
  - The Committee would like clarification on the distribution of the Participant Information Sheet by the clinician as they felt this could be coercive.
  - Please adapt and insert an appropriate introductory paragraph as below:

‘My name is Penelope Noel and I am required to undertake a project as part of my Doctorate in Clinical Psychology and invite you to take part in the following study. However, before you decide to do so, I need to be sure that you understand firstly why I am doing it, and secondly what it would involve if you agreed. I am therefore providing you with the following information. Please read it carefully and be sure to ask any questions you might have and, if you want, discuss it with others including your friends and family. I will do my best to explain the project to you and provide you with any further information you may ask for now or later.’
  - Under ‘Purpose of the study’ – please delete ‘and’ immediately prior to ‘2) to investigate how various ....’.
  - A sentence should be inserted making it clear the clinician will know the participant is taking part in the study and whether the clinician or researcher issues the questionnaire. Also if applicable make it clear if the participants complete their questionnaires privately the allocated clinician will/will not be informed.



- Under 'What does the study entail?' - please explain how to complete the questionnaires and clarify what demographic information will be collected. Also delete 'Please answer each item honestly'.

- Under 'Confidentiality' – you have stated that handling and storage of data will comply with the Data Protection Act (1998) and the data will be stored on your laptop. Please adapt and insert one of the following:

'All information obtained in the study will be stored securely in <<name of department>> and destroyed once the study is completed'.

or

'All information obtained in the study will be stored securely in <<name of department>> and retained for a period of <<number of years>>'.

or

'All information obtained in the study will be stored securely in <<name of department>> and retained indefinitely'.

- Please adapt and insert the appropriate paragraph below under 'Who has reviewed the study?'

'The Tayside Committee on Medical Research Ethics B, which has responsibility for scrutinising all proposals for medical research on humans in Tayside, has examined the proposal and has raised no objections from the point of view of medical ethics. It is a requirement that your records in this research, together with any relevant records, be made available for scrutiny by monitors from the University of Edinburgh and NHS Tayside, whose role is to check that research is properly conducted and the interests of those taking part are adequately protected.'

- Include the standard 'thank you' statement at the end of the information sheet as below:

'Thank you for taking the time to read this Information Sheet and for considering taking part in this study.'

**Please submit a revised Participant Information Sheet, which should include a new version number and new full date.**

### 3. Regarding the Consent Form:

- 'PTSD' should be spelt out in full in the title with the abbreviation in brackets.
- The Committee would like clarification on how you consent participants.

**Please submit a revised Consent Form, which should include a version number and full date as a footer and the new date and version number of Participant Information Sheet in Statement 1.**

### 4. Please provide a signed and dated CV of the Supervisor's CV.

The following points were clarified on the application form:

- Ms Noel clarified that the prevalence of the study was to compare those taking part in Scotland to the symptoms outlined in US clinical data to see if there is a region threshold PTSD.



- Ms Noel clarified that she works as a clinician and will be collecting data. She also confirmed that participants are not new patients as they already have clinicians allocated to them.
- Professor Powers confirmed that the clinicians make a judgement regarding the suitability of participants for the study.
- Professor Powers clarified that participants will have been diagnosed with another disorder and not diagnosed with PTSD. He also confirmed that around 30% of patients have some trauma background.
- Ms Noel clarified that she would make it clear in her result report that she is not comparing representative samples.

When submitting your response to the Committee, please send revised documentation where appropriate underlining or otherwise highlighting the changes you have made and giving revised version numbers and dates.

If the committee has asked for clarification or changes to any answers given in the application form, please do not submit a revised copy of the application form; these can be addressed in a covering letter to the REC.

The Committee will confirm the final ethical opinion within a maximum of 60 days from the date of initial receipt of the application, excluding the time taken by you to respond fully to the above points. A response should be submitted by no later than 25 May 2011.

#### **Membership of the Committee**

The members of the Committee who were present at the meeting are listed on the attached sheet.

#### **Statement of compliance**

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

<b>11/S1402/1</b>	<b>Please quote this number on all correspondence</b>
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Yours sincerely



 **Mrs Sandra Forbes  
Chair**

Enclosures: List of names and professions of members who were present at the meeting and those who submitted written comments

Copy to: Miss Gemma Watson, University of Edinburgh  
NHS Tayside R&D Office



**Tayside Committee on Medical Research Ethics B**

**Attendance at Committee meeting on 14 January 2011**

**Committee Members:**

<b>Name</b>	<b>Profession</b>	<b>Present</b>	<b>Notes</b>
Mrs Sandra Forbes	Lecturer in Nursing	Yes	Chair
Dr Carol MacMillan	Consultant in Intensive Care Medicine & Anaesthesia	Yes	Vice-chair
Dr Robert Martin	GP Member	Yes	Alternate Vice-chair
Dr Lloyd Carson	Lecturer in Psychology	Yes	
Mrs Jacqueline Dunlop	Macmillan Genetic Counsellor	Yes	
Professor M. S. Eljamel	Consultant Neurosurgeon	Yes	
Dr Gary Lyon	Post Graduate Student Liaison Officer	Yes	
Mr Shadi Botros	Lead Clinical Surgical Pharmacist	No	Apologies given
Mr Charles McMurray	Retired NHS Manager	Yes	
Dr Simon Ogston	Lecturer	Yes	
Mrs Patricia Robb	Retired RGN	Yes	
Mrs Anne Simpson	Retired Community Nurse	No	Apologies given
Dr Wendy B Stevenson	Retired	Yes	
Mr Peter Withers	Non-executive member NHS Tayside Board	No	Apologies given

**Also in attendance:**

<b>Name</b>	<b>Position (or reason for attending)</b>
Mrs Caroline Ackland	Scientific Officer
Mrs Lorraine Reilly	Co-ordinator Committee B

## Appendix 7 Study Questionnaires

### CFQ13

Below you will find a list of statements. Please rate how true each statement is for you by circling a number next to it. Use the scale below to make your choice.

1	2	3	4	5	6	7					
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true					
1.	My thoughts cause me distress or emotional pain				1	2	3	4	5	6	7
2.	I get so caught up in my thoughts that I am unable to do the things that I most want to do				1	2	3	4	5	6	7
3.	Even when I am having distressing thoughts, I know that they may become less important eventually				1	2	3	4	5	6	7
4.	I over-analyse situations to the point where it's unhelpful to me				1	2	3	4	5	6	7
5.	I struggle with my thoughts				1	2	3	4	5	6	7
6.	Even when I'm having upsetting thoughts, I can see that those thoughts may not be literally true				1	2	3	4	5	6	7
7.	I get upset with myself for having certain thoughts				1	2	3	4	5	6	7
8.	I need to control the thoughts that come into my head				1	2	3	4	5	6	7
9.	I find it easy to view my thoughts from a different perspective				1	2	3	4	5	6	7
10.	I tend to get very entangled in my thoughts				1	2	3	4	5	6	7
11.	I tend to react very strongly to my thoughts				1	2	3	4	5	6	7
12.	Its possible for me to have negative thoughts about myself and still know that I am an OK person				1	2	3	4	5	6	7
13.	It's such a struggle to let go of upsetting thoughts even when I know that letting go would be helpful				1	2	3	4	5	6	7

*Thank you for completing this questionnaire*

### AAQ-II

Below you will find a list of statements. Please rate how true each statement is for you by circling a number next to it. Use the scale below to make your choice.

1	2	3	4	5	6	7					
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true					
1.	My painful experiences and memories make it difficult for me to live a life that I would value.				1	2	3	4	5	6	7
2.	I'm afraid of my feelings.				1	2	3	4	5	6	7
3.	I worry about not being able to control my worries and feelings.				1	2	3	4	5	6	7
4.	My painful memories prevent me from having a fulfilling life.				1	2	3	4	5	6	7
5.	Emotions cause problems in my life.				1	2	3	4	5	6	7
6.	It seems like most people are handling their lives better than I am.				1	2	3	4	5	6	7
7.	Worries get in the way of my success.				1	2	3	4	5	6	7






Edna B. Foa, PhD

## Test Booklet

PEARSON

 **PsychCorp**

Product Number 51619

**Do not make any marks in this booklet.**

This booklet contains 49 items. Use the separate answer sheet to record your responses to the items. For each numbered item, find the corresponding number on your answer sheet and fill in the circle that matches your answer. Use a pencil and fill in the circles on the answer sheet with a heavy, dark mark. Do not make any marks outside the circles. If you want to change an answer, erase it carefully and then fill in your new choice. Do not make any marks in this booklet.

As you mark each answer, be sure that the item number in the test booklet matches the item number on the answer sheet.

---

## PART 1

---

Many people have lived through or witnessed a very stressful and traumatic event at some point in their lives. Indicate whether or not you have experienced or witnessed each traumatic event listed below by marking  for Yes or  for No on the answer sheet.

- |   |  |
|---|--|
| <p>1. Serious accident, fire, or explosion (for example, an industrial, farm, car, plane, or boating accident)</p> <p>2. Natural disaster (for example, tornado, hurricane, flood, or major earthquake)</p> <p>3. Non-sexual assault by a family member or someone you know (for example, being mugged, physically attacked, shot, stabbed, or held at gunpoint)</p> <p>4. Non-sexual assault by a stranger (for example, being mugged, physically attacked, shot, stabbed, or held at gunpoint)</p> <p>5. Sexual assault by a family member or someone you know (for example, rape or attempted rape)</p> <p>6. Sexual assault by a stranger (for example, rape or attempted rape)</p> | <p>7. Military combat or a war zone</p> <p>8. Sexual contact when you were younger than 18 with someone who was 5 or more years older than you (for example, contact with genitals, breasts)</p> <p>9. Imprisonment (for example, prison inmate, prisoner of war, hostage)</p> <p>10. Torture</p> <p>11. Life-threatening illness</p> <p>12. Other traumatic event</p> <p>13. If you answered Yes to Item 12, specify the traumatic event on the answer sheet.</p> |
|---|--|

**IF YOU MARKED YES TO ANY OF THE ITEMS ABOVE, CONTINUE. IF NOT, STOP HERE.**

Do not make any marks in this booklet.

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## PART 2

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14. If you marked Yes for more than one traumatic event in Part 1, indicate *which one bothers you the most*. If you marked Yes for only one traumatic event in Part 1, mark the same one on the answer sheet.

1. Accident
2. Disaster
3. Non-sexual assault/someone you know
4. Non-sexual assault/stranger
5. Sexual assault/someone you know
6. Sexual assault/stranger
7. Combat
8. Sexual contact under 18 with someone 5 or more years older
9. Imprisonment
10. Torture
11. Life-threatening illness
12. Other traumatic event

**Below are several questions about the traumatic event you marked in Item 14.**

15. How long ago did the traumatic event happen? (mark ONE)
1. Less than 1 month
  2. 1 to 3 months
  3. 3 to 6 months
  4. 6 months to 3 years
  5. 3 to 5 years
  6. More than 5 years

**For the following questions, mark  for Yes or  for No on the answer sheet.**

During this traumatic event:

16. Were you physically injured?
17. Was someone else physically injured?
18. Did you think that your life was in danger?
  
19. Did you think that someone else's life was in danger?
20. Did you feel helpless?
21. Did you feel terrified?

Do not make any marks in this booklet.

---

**PART 3**

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Below is a list of problems that people sometimes have after experiencing a traumatic event. Read each one carefully and choose the answer (0–3) that best describes how often that problem has bothered you IN THE PAST MONTH. Rate each problem with respect to the traumatic event you marked in Item 14.

- ① Not at all or only one time
- ② Once a week or less/once in a while
- ③ 2 to 4 times a week/half the time
- ④ 5 or more times a week/almost always

- |   |   |
|---|---|
| <p>22. Having upsetting thoughts or images about the traumatic event that came into your head when you didn't want them to</p> <p>23. Having bad dreams or nightmares about the traumatic event</p> <p>24. Reliving the traumatic event, acting or feeling as if it was happening again</p> <p>25. Feeling emotionally upset when you were reminded of the traumatic event (for example, feeling scared, angry, sad, guilty, etc.)</p> <p>26. Experiencing physical reactions when you were reminded of the traumatic event (for example, breaking out in a sweat, heart beating fast)</p> <p>27. Trying not to think about, talk about, or have feelings about the traumatic event</p> <p>28. Trying to avoid activities, people, or places that remind you of the traumatic event</p> <p>29. Not being able to remember an important part of the traumatic event</p> <p>30. Having much less interest or participating much less often in important activities</p> <p>31. Feeling distant or cut off from people around you</p> <p>32. Feeling emotionally numb (for example, being unable to cry or unable to have loving feelings)</p> <p>33. Feeling as if your future plans or hopes will not come true (for example, you will not have a career, marriage, children, or a long life)</p> | <p>34. Having trouble falling or staying asleep</p> <p>35. Feeling irritable or having fits of anger</p> <p>36. Having trouble concentrating (for example, drifting in and out of conversations, losing track of a story on television, forgetting what you read)</p> <p>37. Being overly alert (for example, checking to see who is around you, being uncomfortable with your back to a door, etc.)</p> <p>38. Being jumpy or easily startled (for example, when someone walks up behind you)</p> <hr/> <p>39. How long have you experienced the problems that you reported above? (Mark only ONE on the answer sheet.)</p> <ul style="list-style-type: none"><li>1. Less than 1 month</li><li>2. 1 to 3 months</li><li>3. More than 3 months</li></ul> <p>40. How long after the traumatic event did these problems begin? (Mark only ONE on the answer sheet.)</p> <ul style="list-style-type: none"><li>1. Less than 6 months</li><li>2. 6 or more months</li></ul> |
|---|---|

Go on to the next page.

Do not make any marks in this booklet.

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**PART 4**

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Indicate if the problems you rated in Part 3 have interfered with any of the following areas of your life DURING THE PAST MONTH. Mark  for Yes or  for No on the answer sheet.

- 41. Work
- 42. Household chores and duties
- 43. Relationships with friends
  
- 44. Fun and leisure activities
- 45. Schoolwork
- 46. Relationships with your family
  
- 47. Sex life
- 48. General satisfaction with life
- 49. Overall level of functioning in all areas of your life

## Appendix 8 Demographic Information Collected & Questionnaires

Participant ID:

Date	<small>D D M M Y Y</small> □□/□□/□□	Age	□□
Postcode	□□□□□□	Male	<input type="checkbox"/> Female <input type="checkbox"/>

Clinician Identified Problem/Diagnosis:

<input type="checkbox"/> Anxiety	<input type="checkbox"/> Addictive Behaviours
<input type="checkbox"/> Bipolar	<input type="checkbox"/> Cognitive/Memory Impairment
<input type="checkbox"/> Depression/Low Mood	<input type="checkbox"/> General Health Problems
<input type="checkbox"/> Eating Disorder	<input type="checkbox"/> Grief/Loss
<input type="checkbox"/> Personality Problem	<input type="checkbox"/> Interpersonal Issues
<input type="checkbox"/> Psychosis	<input type="checkbox"/> Low Self Esteem
<input type="checkbox"/> Stress	<input type="checkbox"/> Social Issues
<input type="checkbox"/> Substance Misuse	<input type="checkbox"/> Work/Academic
<input type="checkbox"/> Trauma	<input type="checkbox"/> Other (Please specify below)

CORE Outcome:

	Well Being	Problems	Functioning	Risk	All items	All minus R
Total Scores						
Mean Scores						

## Appendix 9 Participant Information Sheet



### ***Title: Nature and extent of trauma symptoms presenting in an Adult Psychological Therapies Service***

My name is Penelope Noel and I am required to undertake a project as part of my Doctorate in Clinical Psychology and invite you to take part in the following study. However, before you decide to do so, I need to be sure that you understand firstly why I am doing it, and secondly what it would involve if you agreed. I am therefore providing you with the following information. Please read it carefully and be sure to ask any questions you might have and, if you want, discuss it with others including your friends and family. I will do my best to explain the project to you and provide you with any further information you may ask for now or later.

#### **Purpose of the study**

Many people will experience one or more potentially traumatic events across a lifetime. Following such an experience, some people develop a set of trauma symptoms which can develop into post traumatic stress disorder (PTSD). In Scotland and the rest of the United Kingdom, little information exists on the prevalence rates of trauma history or PTSD in our services. In addition, we don't fully understand the reasons why some people develop trauma symptoms or PTSD whilst others do not, given similar experiences. The aim of the study is therefore twofold; 1) to investigate how many people attending psychology services have experienced a traumatic event 2) to investigate how various psychological factors influence trauma experiences. These factors include perspective taking, stepping back from thoughts and feelings, as well as behaviours such as avoiding situations. We also want to know how elements of experiencing trauma and other psychological processes influence people's capacity to live successfully with difficult events. Although the study asks about trauma history and symptoms, it may also shed light on other psychological issues (e.g. depression and anxiety).

#### **What does the study entail?**

If you decide to take part, you will be asked to complete a questionnaire pack and consent form. You may choose to do this with your own psychologist or with an independent researcher (Penelope Noel) available to answer questions or discuss any issues you may have. The pack contains four separate questionnaires that ask about your experiences, feelings and beliefs and will take up to 30 minutes to complete. If you choose to participate, an appointment will be arranged for a time that suits you or you can complete the forms at one of your usual appointments. You will not be asked to share any of your responses with your clinician or the researcher as they are only on hand to discuss any issues or answer any questions you may have. There will be a covering page that your psychologist will complete which is a basic demographic data set. This is a tick box form which records your age, gender, ethnicity, diagnosis, postcode and the Clinical Outcomes in Routine Evaluation (CORE) score (a questionnaire you completed at the start of treatment). Your psychologist will therefore know of your participation but will not have access to your responses on the questionnaires unless you feel that it is important to share this information with them. Once the questionnaires are complete the clinician will ask you to place them in a sealed box on your way out of the clinic or in self addressed envelope addressed to the researcher. The pack will have its own identifying research code which matches your consent form so you don't have to write your name or any other personal details on the questionnaires but we can still trace your data should you decide to withdraw at any stage. When completing the questionnaires there are instructions at the top of each page. Please read them carefully and if you are unsure of your response go with your first reaction or ask for further clarification. You may find that

some of the items give rise to difficult feelings. Your psychologist or the researcher is available to discuss these with you at any time and provide any further information you may require.

### **Voluntary participation**

Your participation in this study is entirely voluntary and you may withdraw at any time. You may contact me directly (details over the page) or let your psychologist know and upon which your data will be immediately destroyed. You need not give a reason for doing so and if you decide not to participate or withdraw it will not affect your treatment in any way.

### **Confidentiality**

The handling and storing of the data will comply with the Data Protection Act (1998). The information you provide will be kept confidential and will be analysed as a part of a group rather than individually. No identifying details will be published as all data is anonymous. This is done by keeping the questionnaires separate from consent forms which are both held securely within the Dundee Adult Psychological Therapies Service and destroyed once the study is complete. All the anonymous data obtained from the questionnaires will be stored securely in the Dundee Adult Psychological Therapies Service and retained for a period of five years in accordance with research standards. You will be allocated a research code which we can use to find your data and destroy it should you decide to withdraw at any time. If you would like a summary of the results once the study is complete, please indicate your preference on the consent form or feel free to contact the researcher directly, details below. The study should be complete by August 2011.

### **Who has reviewed the study?**

The Tayside Committee on Medical Research Ethics B, which has responsibility for scrutinising all proposals for medical research on humans in Tayside, has examined the proposal and has raised no objections from the point of view of medical ethics. It is a requirement that your records in this research, together with any relevant records, be made available for scrutiny by monitors from the University of Edinburgh and NHS Tayside, whose role is to check that research is properly conducted and the interests of those taking part are adequately protected.

### **Complaints**

If you are dissatisfied with any aspect of this research then I would encourage you to get in touch with me or your own psychologist so that we may try to resolve any issues for you. Should you wish to make a formal complaint, this can be done through the NHS complaints procedure by contacting the Complaints and Claims Manager, Complaints and Advice Team Level 7, Ninewells Hospital, Dundee, DD1 9SY, Freephone: 0800 027 5507 in writing or by emailing: [complaints.tayside@nhs.net](mailto:complaints.tayside@nhs.net).

### **Further Information & Contact Details**

If you require further information or have any questions about the study or your participation, then please get in touch. You need not state your name or where you attend for treatment.

Penelope Noel

Trainee Clinical Psychologist  
Dundee Adult Psychological Therapies Service  
7 Dudhope Terrace  
DUNDEE  
DD3 6HG

Email: [penelope.noel@nhs.net](mailto:penelope.noel@nhs.net)

***Thank you for taking the time to read this Information Sheet and for considering taking part in this study.***



## Appendix 10 Opt In Slip

**Title of Project:** Nature and extent of posttraumatic stress disorder (PTSD) symptoms presenting in an Adult Psychological Therapies Service

**Researcher:** Penelope Noel

If you would like to opt in to participate in the above study which is outlined in the Participant Information Sheet (included herewith), please either:

- i) Let your clinician know at your next appointment

or

- ii) Contact the researcher directly, details below

Penelope Noel  
Trainee Clinical Psychologist  
Dundee Adult Psychological Therapies Service  
7 Dudhope Terrace  
DUNDEE  
DD3 6HG

Tel: 01382 306150

Email: [penelope.noel@nhs.net](mailto:penelope.noel@nhs.net)

## Appendix 11 Participant Consent Form



### Consent Form

**Title of Project:** Nature and extent of posttraumatic stress disorder (PTSD) symptoms presenting in an Adult Psychological Therapies Service

**Researcher:** Penelope Noel

- I confirm that I have read and understood the information sheet dated 28/01/2011 (version 2) for the study. I have had the opportunity to consider the information, ask questions and have these answered satisfactorily.
- I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without any psychological care or legal rights being affected.
- I agree to take part in the above study.
- Please tick the box if you would like to receive a summary of the results on completion of the study.

Name of participant	Date	Signature

Name of person taking consent	Date	Signature

*When complete, 1 for participant and 1 for researchers*

## Appendix 12 Clinician guide Information Sheet

### Clinician Guidelines for Trauma Symptoms Study

Dear Clinicians

Due to the nature of my project, I am asking Clinicians to complete a pack of questionnaires and be available to support their patients who opt in to the study (procedure outlined below). However, before approaching any of your patients, it is important to know that there is a chance that they may disclose a trauma history and/or symptoms, which may or may not, require intervention. It is therefore important that you feel you are able provide the necessary information or care to support such a disclosure before agreeing to help me with my project. Although the study focuses on trauma experiences, we are collecting data on all people seeking psychological help in our primary care service and seek a representative (as far as possible) sample from your clinical caseload.

#### Who to approach?

All your patients on your caseload who you have built up a therapeutic relationship with and are treating. Please do not approach new referral or assessment cases. Clinicians are asked to use their clinical judgement in this regard and not approach any patients they feel such a request would be detrimental to either the therapeutic relationship or the patients well being. **Please do not self select patients you think may have a trauma history, try to be as representative as possible.**

#### What to do?

- Hand out the Opt in slip with participant information sheet to all treatment cases deemed suitable as above. Please state that **participation is entirely voluntary and open to anyone with, or without, a history of trauma.**
- During the next session, ask if your patient would like to opt in. If they would not like to participate, no further action should be taken. If your patient opts in, agree a time to complete the questionnaires in your session.
- Complete the questionnaire pack:
  10. Take consent asking your patient if they would like feedback from the study and to tick the box as appropriate. Please ask if they would like to provide an email address for this or they can contact me directly via contact details given.
  11. Clinician to fill out the minimum data set, including initial CORE score from assessment, and very importantly, indicate **your** diagnosis or the main presenting problem and not the referral diagnosis/reason.
  12. Start with the Cognitive Fusion Questionnaire (CFQ) followed by Valued Living Questionnaire (VLQ) and Acceptance and Action (AAQ) in any order. This should take around 10 minutes.
  13. Next, complete the Posttraumatic Stress Diagnostic Scale (PDS). *The patient may need support to do this as the questions are separate to the answer booklet (like in a multiple choice exam paper).*
  14. If the patient does not endorse a traumatic event in Part 1, do not continue and participation is complete.

15. If the patient endorses a traumatic event in part 1, the patient continues to answer the rest of the questionnaire. This questionnaire takes around 15 minutes.
16. Once complete, photocopy the consent form to give to the participant.
17. Finally, place the remaining forms (consent form/PIS and questionnaires) in the A4 envelope provided and return this to me via internal mail.

- **Please note how many patients you hand the participant information sheet to, and how many actually complete the pack. Please send this information to me via email (details below) when finished helping me with my study.**

### **What are some potential benefits?**

The questionnaires may provide participants with the opportunity to address some issues which had not previously been discussed whilst in your care.

We may get a better understanding of how many people present to our service with trauma symptoms. This may then help shed light on if we are identifying such symptoms (especially sub-threshold forms of PTSD) effectively, and whether we are offering appropriate treatment for such symptoms?

Those who request feedback of a summary of the overall findings may increase their knowledge of the nature of trauma and therefore better understand some of the factors contributing to their difficulties.

In the longer term, it is hoped that this study will enable a greater understanding of factors which may be involved in the development of trauma symptoms and therefore inform psychological treatment thereof.

If you have any question regarding my project, please do not hesitate to contact me.

Your support is very much appreciated.

Penelope Noel  
Trainee Clinical Psychologist  
Dundee Adult Psychological Therapies Service  
7 Dudhope Terrace  
DUNDEE  
DD3 6HG

Tel: 01382 306150

Email: [penelope.noel@nhs.net](mailto:penelope.noel@nhs.net)