

**TITLE**

A Comparison of Cognitive Functioning, Resilience, and Childhood Trauma among Individuals  
with SAD and PTSD

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Faculty of Arts at Stellenbosch University.*



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## DECLARATION

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## ABSTRACT

*Background:* Both human and animal studies indicate that early trauma can influence brain development and can lead to dysregulation and dysfunction. This includes cognitive deficits. The risk of childhood trauma (CHT) and resulting cognitive deficits are well established in Posttraumatic Stress Disorder (PTSD). This is not the case for Social Anxiety Disorder (SAD). The experience of CHT does not inevitably lead to later psychopathology, suggesting that resiliency factors may be at play. Indeed, research shows that resilience is protective against the development of PTSD although this has not been well studied in SAD, particularly in the context of childhood trauma and neurocognition. *Methods:* This exploratory study assessed for the possible contribution of CHT on cognitive functioning in adults with SAD. We assessed 44 individuals who formed part of a larger study on neurocognitive and neuroimaging correlates in a sample drawn from the Western Cape, South Africa. Using a neuropsychological test battery, memory, attention and executive functioning (EF) (underpinned by hippocampal, cingulate cortex and pre frontal-cortex function respectively) were assessed. CHT was assessed with the Childhood Trauma Questionnaire (CTQ). We compared neurocognitive and resilience (CD-RISC) variables across four groups (SAD with trauma, SAD without trauma, PTSD and healthy controls) using analysis of variance (ANOVA) statistics. *Results:* None of the groups differed significantly on cognitive variables, however, on average all outcomes were in the predicted direction. Separate analyses for the traumatised groups only showed a significant effect for EF and attention, suggesting an association between EF, attention and CHT. On a measure of resilience, healthy controls had significantly higher resilience scores than the other 3 groups. Unexpectedly, SAD and PTSD groups with CHT had higher resilience scores than the SAD group without CHT, suggesting that resilience moderates CHT. Lastly individuals with SAD and PTSD with CHT reported more emotional abuse and neglect than any other type of childhood trauma. *Conclusion:* This exploratory study is unique in its comparative assessment of the effects of CHT and resilience on neurocognition in participants with SAD and PTSD. Limitations and recommendations for future research are discussed.

## OPSOMMING

*Agtergrond:* Beide mens- en dierestudies dui daarop dat vroeë trauma brein ontwikkeling kan beïnvloed en kan lei tot disfunksie. Dit sluit kognitiewe tekortkominge in. Die risiko van vroeë kinderjare trauma (KJT) en die gevolglike kognitiewe tekortkominge is goed gevestig in Posttraumatische stresversteuring (PTSV). Dit is egter nie die geval in Sosiale angsversteuring (SAV) nie. Die ervaring van KJT lei nie noodwendig tot latere psigopatologie nie, wat daarop dui dat veerkragtigheidsfaktore 'n rol kan speel. Trouens, navorsing toon dat veerkragtigheid beskermend is teen die ontwikkeling van PTSV, maar dit is egter nie behoorlik nagevors in SAV nie - veral nie in die konteks van vroeë kinderjare en neurokognisie nie. *Metodologie:* Hierdie verkennende studie het die invloed van KJT op kognitiewe funksionering in 44 individue geëvalueer. Hierdie studie het deel gevorm van 'n groter studie oor neurokognitiewe- en neurobeeldingskorrelate in 'n steekproef wat gewerf is uit die Wes-Kaap, Suid-Afrika. 'n Neurosielkundige toetsbattery was gebruik om geheue, aandag en uitvoerende funksionering (UF) (wat onderskeidelik deur die hippokampus, cingulate korteks en prefrontale korteks ondersteun word) te assesser. KJT is beoordeel met die "Childhood Trauma Questionnaire" (CTQ). 'n Analise van variansie (ANOVA) was gebruik om die neurokognitiewe en veerkragtigheid (CD-RISC) veranderlikes oor vier groepe (SAV met trauma, SAV sonder trauma, PTSV en gesonde kontrole) te vergelyk. *Resultate:* Nie een van die groepe het beduidend verskil van mekaar op grond van kognitiewe veranderlikes nie, maar oor die algemeen was alle uitkomstes in die voorspelde rigting. Afsonderlike analyses op die getraumatiseerde groepe het 'n beduidende effek gehad vir UF en aandag, wat dui op 'n assosiasie tussen UF, aandag en KJT. Die gesonde kontrole het beduidende hoër veerkragtigheid tellings as die ander 3 groepe gehad. SAV en PTSV groepe met KJT het teen verwagtinge hoër veerkragtigheidstellings gehad as die SAV sonder KJT, wat daarop dui dat veerkragtigheid KJT modereer. Laastens, individue met SAV en PTSV met KJT het meer emosionele mishandeling en verwaarlosing gerapporteer as enige ander tipe kinderjare trauma. *Bespreking:* Hierdie verkennende studie is uniek in sy vergelykende evaluering van die invloed van KJT en veerkragtigheid op die neurokognisie in deelnemers met SAV en PTSV. Beperkings en aanbevelings vir toekomstige navorsing word bespreek.

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## CONTENTS

DECLARATION .....	ii
ABSTRACT.....	iii
LIST OF TABLES.....	x
CHAPTER 1 INTRODUCTION .....	1
1.1 Introduction .....	1
1.1.1 Definition of trauma.....	1
1.1.2 Definition of CHT .....	2
1.1.3 Impact of CHT .....	2
1.1.4 Definitions of SAD and PTSD.....	2
1.1.5 Cognitive deficits in SAD and PTSD .....	3
1.1.6 Cognitive deficits and CHT .....	4
1.1.7 Resilience.....	4
1.1.8 Chapter overview .....	5
CHAPTER 2 THEORETICAL PRINCIPLES AND REVIEW OF THE LITERATURE.....	6
2.1 PTSD, SAD and Cognitive Functioning .....	6
2.2 Cognitive functioning.....	6
2.2.1 Executive Functioning .....	6
2.2.2 Attention .....	8
2.2.3 Memory.....	8
2.3 Brain Development .....	9
2.4 Effects of CHT on brain development .....	10
2.5 CHT and cognitive functioning.....	12
2.6 Cognitive functioning in PTSD.....	13
2.7 Cognitive functioning in SAD.....	15
2.8 Resilience .....	16
2.9 Resilience CHT, SAD and PTSD.....	17
2.10 Summary.....	18
2.11 Rationale of the study .....	18
2.12 Aims of the study.....	19

2.13	Objectives of the study .....	19
2.14	Hypothesis .....	20
CHAPTER 3 CHILDHOOD TRAUMA IN SAD AND PTSD: A SYSTEMATIC REVIEW .....		21
3.1	Introduction .....	21
3.1.1	CHT and maltreatment .....	21
3.2.2	Impact of CHT .....	21
3.2.3	CHT in PTSD and SAD .....	22
3.3	Methods .....	23
3.3.1	Aims .....	23
3.3.2	Type of studies .....	23
3.3.3	Inclusion and exclusion criteria .....	24
3.3.4	Study selection .....	24
3.3.5	Search strategy/Library databases .....	24
3.3.6	Quality appraisal .....	24
3.3.7	Data extraction .....	25
3.3.8	Data analysis .....	25
3.4	Results .....	35
3.4.1	Samples .....	35
3.4.2	Diagnostic measurement .....	35
3.4.3	CHT variables .....	36
3.4.4	Studies of CHT in PTSD .....	37
3.4.5	Studies of CHT in SAD .....	39
3.4.6	Studies examining both SAD and PTSD .....	40
3.5	Discussion .....	41
CHAPTER 4 RESEARCH METHODOLOGY .....		43
4.1	Research design .....	43
4.2	Participants .....	43
4.3	Procedure .....	43
4.4	Measurements .....	45
4.4.1	Demographic variables .....	45
4.4.2	Diagnostic measures for PTSD and SAD .....	46
4.4.3	Symptom severity and frequency of PTSD and SAD .....	46

4.4.4	Childhood Trauma .....	48
4.4.5	Resilience.....	50
4.4.6	Cognitive functioning in SAD and PTSD.....	50
CHAPTER 5 RESULTS .....		54
5.1	Introduction.....	54
5.1.1	Descriptives.....	54
5.2	Primary Aims of the study .....	54
5.2.1	Cognitive deficits in SAD with and without CHT, and PTSD secondary to CHT .....	55
5.2.2	Memory.....	55
5.2.3	Attention .....	56
5.2.4	Executive Functioning .....	56
5.3	Secondary Aims of the study .....	56
5.3.1	Resilience in SAD with and without CHT and PTSD secondary to CHT.....	56
5.3.2	CHT, cognitive functioning, and resilience .....	57
5.3.3	Reported types of CHT in SAD and PTSD .....	58
CHAPTER 6 DISCUSSION AND RECOMMENDATIONS FOR FUTURE RESEACH.....		63
6.1	Cognitive deficits in SAD, and PTSD.....	63
6.2	Resilience, the effects of CHT alone and the CHT subtypes in PTSD and SAD .....	65
6.3	Limitations of the study and recommendations for future research.....	66
REFERENCES .....		69
APPENDIX A.....		85
A1.	Study description for Participants .....	85
A2.	Study description for Colleagues/Clinics/Health Professionals.....	87
A3.	Study Advertisement .....	88
A4.	E-mail to health professionals .....	89
APPENDIX B .....		90
B1.	Pre-Screening Telephone Interview .....	90
B2.	Demographic Questionnaire .....	92
B3.	Informed Consent .....	96
APPENDIX C.....		102



C1. MINI.....	102
C2. CAPS .....	103
C3. LSAS .....	104
APPENDIX D.....	105
D1. CTQ-SF.....	105
D2. CD-RISC .....	106
APPENDIX E .....	107
E1. Neuropsychological Testing Protocol.....	107
E2. Wechsler Memory Scale: Associate Learning; immediate recall.....	112
E3. Wechsler Memory Scale: Logical Memory; immediate recall.....	113
E4. Wechsler Memory Scale: Associate Learning; delayed recall .....	114
E5. Wechsler Memory Scale: Logical Memory; delayed recall .....	115
E6. Stroop task .....	116

## **LIST OF TABLES**

Overview of systematically reviewed studies	26
Overview of sample characteristics	61
Overview of demographic, diagnostic and behavioural measurement outcomes	62
Overview of Neurocognitive measurement outcomes	63
Overview of Traumatized vs. Non Traumatized group outcomes	64

## **CHAPTER 1**

### **INTRODUCTION**

#### 1.1 Introduction

Childhood trauma (CHT) is a major risk factor for the development of Posttraumatic Stress Disorder (PTSD) (Ballenger et al., 2004; Bandelow, Charimo Torrente, Wedekind, Broocks, Hajak, & R  ther, 2004; Brewin, Lanius, Novac, Schnyder, & Galea, 2009; Etkin & Wager, 2007). In addition, research shows that individuals suffering from Social Anxiety Disorder (SAD) report significantly higher levels of CHT compared to healthy individuals (Bandelow, Charimo Torrente, Wedekind, Broocks, Hajak, & R  ther, 2004). This in line with research conducted on CHT and PTSD suggests a possible predispositional effect of CHT on the development of PTSD and SAD. CHT has been shown to affect neurodevelopment (Perry, Pollard, Blakley, Baker, & Vigilante, 1995; Teicher et al., 2003; van der Kolk, 2003), and recent research suggests that this may be expressed through neurocognitive deficits (Majer, Nater, Lin, Capuron, & Reeves, 2010). Deficits in cognitive functioning have been well established in PTSD samples. This has not been the case in SAD. Following the experience of early trauma, only a minority of individuals develop PTSD, SAD or other psychopathology over the course of their lives suggesting that resiliency factors are important (Brewin et al., 2009). Research has shown that resilience can be protective in populations with PTSD (Hoge, Austin, & Pollack, 2007). Resilience, as a protective factor, has not previously been assessed in samples with SAD.

##### 1.1.1 Definition of trauma.

The Diagnostic and Statistical Manual of Mental Disorders, 4<sup>th</sup> edition (DSM-IV-TR; American Psychiatric Association, 2000) defines a traumatic event as fulfilling (i) Criterion A1: ‘experiencing, witnessing, or being confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of others’ (p. 427, American Psychiatric Association, 2000) and (ii) Criterion A2: ‘the person’s response involves ‘intense fear, helplessness, or horror’ (p. 428, American Psychiatric Association, 2000).

### 1.1.2 Definition of CHT

Accordingly, CHT is defined as any traumatic experience that a child endures before the age of 18 years and that falls within one or more dimensions of Childhood Questionnaire (CTQ). The five dimensions of the CTQ include emotional abuse (EA), physical abuse (PA), sexual abuse (SA), physical neglect (PN) and emotional neglect (EN) (Bernstein, Ahluvalia, Pogge, & Handelsman, 1997) .

### 1.1.3 Impact of CHT

Significant effects on brain development have been observed in individuals who have experienced traumatic stress (Lupin, McEwen, Gunnar and Heim; 2009). Retrospective studies show that early traumatic experiences have subsequent adverse effects later in life and make individuals increasingly vulnerable, even to mild stressors (Nemeroff, 2004). Additionally, recent research has demonstrated that these experiences may lead to deficits in cognitive functioning later in life (Majer et al., 2010). CHT has also been shown to alter brain development and increase the risk of later life anxiety disorders (Heim & Nemeroff, 2001). CHT is recognized as a significant risk factor in the later development of PTSD (Ballenger et al., 2004; Bandelow, Charimo Torrente, Wedekind, Broocks, Hajak, & R  ther, 2004; Etkin & Wager, 2007).

Recent work has found that individuals with SAD also report high rates of CHT (Bandelow, Charimo Torrente, Wedekind, Broocks, Hajak, & R  ther, 2004; Etkin & Wager, 2007; Safren, Gershuny, Marzol, Kuo, Goldin, Werner, Heimberg, & Gross, 2011; Otto, & Pollack, 2002; Zayfert, DeViva, & Hofmann, 2005). The extent to which differences in cognitive deficits in adults with SAD & PTSD may be mediated by CHT represents a novel area that has not yet been elucidated.

### 1.1.4 Definitions of SAD and PTSD

SAD is characterized by symptoms of pathological fear of social and/or performance situations. This often results in avoidance, panic attacks, marked fear of public scrutiny, and manifest negative biases in social information processing. SAD can manifest in two forms, generalized SAD and a specific SAD. Generalized SAD can be defined as social fear that is generalized over a broad spectrum of social situations. The individual

develops a pathological fear that can drastically influence his or her social interactions in a negative way. The specific form is defined as a fear of a specific social or performance situation, for example public speaking (American Psychiatric Association, 2000)

PTSD is a disorder associated with an abnormal response to a life-threatening traumatic experience. Since PTSD was first introduced as a disorder in 1980 several iterations have been made to the diagnostic criteria (Jones & Wessely, 2007). The current edition of the Diagnostic and Statistical Manual (DSM-IV-TR) (American Psychiatric Association, 2000) requires, most importantly, that a traumatic event of sufficient magnitude be experienced (Criterion A1). This experience is then accompanied by a specified reaction (affect) (Criterion A2), resulting in one or more symptoms of re-experience, three or more symptoms of avoidance, and two or more symptoms of hyper arousal (Criterion B - D respectively). If these symptoms cause the individual clinically significant distress (Criterion F) and have lasted at least one month (Criterion E) a diagnosis of PTSD can be made (American Psychiatric Association, 2000).

#### 1.1.5 Cognitive deficits in SAD and PTSD

According to the DSM- IV-TR, SAD and PTSD share symptoms of fear and avoidance of feared stimuli (American Psychiatric Association, 2000). Recent research suggests that particular cognitive profiles may distinguish specific anxiety disorders. However, much of this research is based on studies assessing individuals with obsessive-compulsive disorder and PTSD and there has been far less investigation of SAD (Elzinga, Spinhoven, Berretty, de Jong, & Roelofs, 2010; Ferreri, Lapp, & Peretti, 2011). Furthermore, much of the available research on impairments in individuals with SAD has concentrated on emotional deficits and not on the cognitive components (Bush, Luu, & Posner, 2000; Ferreri et al., 2011; Goldin, Manber, Hakimi, Canli, & Gross, 2009). That said, studies of cognitive functioning in SAD and PTSD that have so far been conducted have reported deficits in neuropsychological test performances in both disorders. Specifically, individuals with SAD and PTSD manifest impairments in executive function (Etkin & Wager, 2007), verbal learning and memory (Buckley, Blanchard, & Neill, 2000; Coles & Heimberg, 2002). How SAD and PTSD differ with regards to cognitive deficits is not clear. Furthermore, studies indicate that anxious individuals have attentional

biases that affect the processing of information and this has been documented specifically in individuals with SAD and PTSD (Becker, Rinck, Margraf, & Roth, 2001; Buckley et al., 2000; Coles & Heimberg, 2002; Heinrichs & Hofmann, 2001; Mathews & MacLeod, 2005). These studies point to anxiety specific cognitive impairments in these disorders and dysregulation of specific neural circuits.

#### 1.1.6 Cognitive deficits and CHT

The regulatory function of the brain is believed to develop progressively from childhood into adulthood (Rubia et al., 2006). This suggests that we become better at regulating cognition and behaviour the more we develop. It also suggests that developmental problems can affect regulatory mechanisms (Rubia et al., 2006). Stressful and aversive experiences, such as CHT, may ultimately lead to deficits in individuals with SAD and PTSD as a consequence of failure to inhibit, regulate and/or retrieve significant information. Animal work on the influence of stress on the brain suggests that stress is healthy and useful for the development of young animals, however high levels of stress can negatively affect development (Nemeroff, 2004). Young rodents deprived of maternal care during a critical postnatal period, exhibit neurobiological changes in development that lead to increased vulnerability to stress in adulthood (Nemeroff, 2004). Although studies that have retrospectively assessed the experience of early stressors such as CHT in adults have documented similar findings, the extent to which the neurobiological observations in rodents are comparable to humans is not entirely known. Indeed, periods of plasticity within the brain most likely differ between species and effects of early trauma are assumed to have more complex outcomes in humans and are affected by variables such as resilience, personality, social support and coping skills (Nemeroff, 2004).

#### 1.1.7 Resilience

Resilience reflects an ability to maintain a stable equilibrium and is characterized by good outcomes to aversive experiences (such as trauma) (Bonanno, 2004). A lack of resilience is found to pose a serious threat to adaptation or development and can influence an individual's traits and/or state during these experiences (Bonanno, 2004; Masten et al., 1999). Resilience to aversive experiences can evolve through many pathways and dimensions of traits and/or states in an individual. Examples of these are hardiness, self-enhancement,

repressive coping, positive emotion and laughter (Bonanno, 2004). Research shows that resilience is a result of the operation of the basic human adaptation system. If these systems are protected and in good working order the development of resilience is robust, even in the light of aversive experiences (Bonanno, 2004; Masten et al., 1999). However, if these systems are impaired as a consequence of aversive experiences, the risks of developmental problems are increased (Masten et al., 1999). As Bonanno (2004) has stated, ‘a better understanding of resilience is important to better understand dysfunction’ (Bonanno, 2004).

#### 1.1.8 Chapter overview

The following chapters will provide an overview of the literature on resilience, CHT, PTSD, and SAD. Chapter 2 provides an overview of brain function, brain development, effects of CHT on brain development and function and possible links between CHT and the development of SAD and PTSD. CHT, the effects of CHT, and the possibility of the different types of CHT predisposing individuals to develop either SAD or PTSD is discussed and systematically reviewed in chapter 3. Chapters 4 and 5, respectively, discuss the methods and outcomes of this study. A discussion of the results and recommendations for future directions can be found in Chapter 6.

## CHAPTER 2

### THEORETICAL PRINCIPLES AND REVIEW OF THE LITERATURE

#### 2.1 PTSD, SAD and Cognitive Functioning

Traumatic experiences during childhood are an established risk factor for the development of psychiatric disorders such as PTSD (Yehuda et al., 2010). Furthermore, in line with findings in PTSD samples, samples with SAD report high levels of CHT (Elzinga, Spinhoven, Berretty, de Jong, & Roelofs, 2010). Although there is an extensive literature base on the psychobiology and phenomenology of both PTSD and SAD, relatively little is known about the cognitive deficits underlying these disorders (Goldin, Manber, Hakimi, Canli, & Gross, 2009; Horner & Hamner, 2002), and more specifically with regard to the possible effects of CHT on cognitive function (Majer, Nater, Lin, Capuron, & Reeves, 2010).

#### 2.2 Cognitive functioning

Specific neural circuits within the limbic- cortical system of the brain mediate mood and emotional regulation and stress responsiveness, and dysregulation of these circuits is thought to underlie anxiety disorders (Ressler & Mayberg, 2007). Dysregulation characterises information processing and experience which is regulated by interactions of the prefrontal Cortex (PFC) and the cingulate cortex (CC), as well as memory formation and retrieval which are regulated, respectively, by the hippocampus (HC) and the amygdala (Ressler & Mayberg, 2007).

##### 2.2.1 Executive Functioning

Both SAD and PTSD share symptoms of fear and avoidance of feared stimuli (APA, 2000). The key region underpinning fear response is the amygdala (Cozolino, 2002; Cozolino, 2006; Phan, Wager, Taylor, & Liberzon, 2002). Together with the PFC the amygdala is important in the control of behavioural reactivity and regulation (Goldin et al., 2009). While the amygdala gives significance (or salience) to events, the PFC is involved in goal- directed inhibition (Konishi et al., 1999; Rubia et al., 2006), and has a counter regulatory role



in stress and fear responses through inhibitory effects on the amygdala (Rubia et al., 2006). Through its role in response inhibition and error detection (Rubia et al., 2006), the PFC enables us to make appropriate choices in the face of changing conditions by inhibiting response tendencies (Konishi et al., 1999). This cognitive process is referred to as executive functioning (EF).

EF is often referred to as a controlled and effortful contrast to processes that are automatic or routine. It acts in combining information already present in the mind with information that is newly acquired (Williams, Suchy, & Rau, 2009). As Suchy (2009) has explained, EF is a multidimensional construct consisting of future orientated ability to generate plans and goals ('set formation'), to motivate and focus oneself to execute these plans and goals ('set maintenance'), and to alter these goals and plans in response to environmental changes ('set shifting') (Suchy, 2009). EF consists of a set of controlled and effortful processes that effectively matches information already acquired with newly gained information from the environment (Williams et al., 2009). EF does so by forming bridges between the more primitive processes (e.g. emotional reactions) with the more advanced processes (e.g. language) (Williams et al., 2009). The importance of EF lies in enabling us to adjust and alter behaviour, and orientate ourselves in reaction to important cues from our environment but also in enabling us to regulate responses from within (such as down-regulating emotional reactions) (Williams et al., 2009).

The most well characterised executive functions found in the literature are shifting of mental sets, monitoring and updating of working memory representations, and inhibition of pre-potent responses (Lezak, 2004; Miyake et al., 2000). These are prototypically measured with the Stroop Colour Word Test and the Wisconsin Card Sorting Task (WCST) (discussed in detail in the measures section). These measures, respectively, are evidence-based indicators of inhibition, and task shifting (Miyake et al., 2000). The frontal lobes are further involved in criterion setting and monitoring during memory retrieval and the regulation of attention (Lezak, 2004).

### 2.2.2 Attention

As previously mentioned, the frontal lobes are responsible for the regulation of attention (Lezak, 2004). Attention entails the careful attendance to target stimuli while inhibition is associated with the recruitment of the executive attention network localized in the anterior cingulate cortex (ACC) (Lezak, 2004). Together with the cingulate cortex (CC), the PFC mediates the capacity to make and control shifts in attention (Lezak, 2004). The ACC maintains social mores and regulates fear related behaviour and selective attentional processing (Bush, Luu, & Posner, 2000). The PFC and the ACC have been shown to be co-active when new problems arise that need solving (Lezak, 2004). This co-activation lasts till the task is learned and is no longer present when the task becomes automatic (Lezak, 2004). The CC consists of numerous specialized subdivisions that subserve cognitive, motor, nociceptive and visuospatial functions (Bush et al., 2000). The ACC is regarded as 'executive' in function and can be differentiated from the posterior cingulate cortex (PCC) based upon its specific projection patterns and functions which are divided into specific areas that control emotional and cognitive information (Bush et al., 2000). The cognitive division of the ACC comes into action when cognitively demanding tasks that involve stimulus-response selection in the face of competing streams of information (Bush et al., 2000) are undertaken. This has been shown to be most effectively measured with the Stroop Task (Miyake et al., 2000) (the Stroop task is discussed in detail in the measurement section of Chapter 4).

### 2.2.3 Memory

The neuroanatomical loci of memory include cortical and subcortical structures. Subcortical structures include the amygdala and hippocampus. Cortical structures include the prefrontal cortex, the ACC and the orbitofrontal cortices. The hippocampus is thought to be vital to cognitive processes that involve conscious memory. These processes are also referred to as declarative or explicit memory and form the opposite of reflexive or implicit memory. Removal or damage of the hippocampus leads to deficits in recall and formation of new memories (Brown, Rush, & McEwen, 1999). Furthermore the hippocampus plays an important role in the down-regulation of the body's hypothalamic-pituitary-adrenal axis (HPA-Axis), or stress response (Yehuda et al., 2010). The hypothalamus is activated in response to stress, releasing neuropeptides Corticotrophin

Releasing Hormone (CRH) and Vasopressin. As a result of CRH release, Adrenocorticotrophic (ACTH) is released by the anterior pituitary gland which stimulates the release of Glucocorticoids (GC) which, as a prerequisite for adaptation, have multiple functions vital to the restoration of biological homeostasis (Yehuda et al., 2010). The hippocampus provides negative feedback - or inhibitory influence- as a result of the stress response and down- regulates the stress response, thus helping the brain to cope in times of greater need (Brown et al., 1999). Indeed, owing to its many GC receptors, the hippocampus is particularly sensitive to damage secondary to overstimulation of GC receptors in times of severe stress (brown et al., 1999). This has been shown to lead to memory deficits (Brown et al., 1999).

### 2.3 Brain Development

A review of the literature on brain development showed that functions such as attention and memory both follow a linear developmental pattern with regards to behaviour and physiological development (Casey, Giedd, & Thomas, 2000). The frontal lobes and its functions are believed to develop progressively from childhood into adulthood (Rubia et al., 2006). The organisation and development of the prefrontal cortex (PFC) undergoes prolonged physiological development and is believed to involve working memory, response inhibition and attention allocation (Casey et al., 2000). Even though these cognitive processes are often treated as distinct psychological constructs they may in fact be part of one underlying circuitry. For example, when we are presented with novel stimuli, attention and memory are directed and competing influences are inhibited (Casey et al., 2000).

In support of the gradual maturation on the brain, a meta- analysis by Paus (2005) found that the dorsolateral PFC matures in individuals over time and cortico-hippocampal pathways undergo increased myelination in late adolescence (Paus, 2005). This indicates a strengthening of connections between the hippocampus and the frontal cortices as we mature over time (Paus, 2005). A recent review assessing EF development of children over a wide age span found that differences in the three core functions of the EF differ according to developmental rate and age (Best & Miller, 2010; Best & Miller, 2010). Inhibition, a core function

of EF, develops at a slower rate during adolescence and is paired with greater brain localization up until adolescence (Best & Miller, 2010).

Much like the development of inhibition, working memory development involves progressive and regressive changes. However, working memory develops in a linear fashion from childhood to adolescence compared to inhibition (Best & Miller, 2010). The ability to successfully shift between tasks, (a third component of EF) follows a sudden spurt in development during adolescence to reach adult-like capacity in late adolescence (Best & Miller, 2010). Functional imaging studies have found that the frontal lobes are involved with the encoding and retrieval of memory in adults (Sowell, Delis, Stiles, & Jernigan, 2001). Furthermore, the maturation of the frontal lobes is specifically related to improved memory function over time (Sowell et al., 2001). This indicates that there is anatomical specificity in improved memory function and brain maturation over time (Sowell et al., 2001). The aforementioned suggests that brain functioning becomes advanced over time, and we become better at regulating behaviour and cognition as we mature; however, these processes are prone to developmental insults.

#### 2.4 Effects of CHT on brain development

The expression of genes responsible for the capacity building and structural organization functions of the human brain is dependent on a sequence of developmental and environmental experiences (Anda et al., 2006). These functions are vulnerable to abnormal, extreme and repetitive patterns of stress during critical periods in its development (Anda et al., 2006). Since the developing brain is not equipped with a mature stress response and regulatory ability (Anda et al., 2006) the consequences of persistent stress could be potentially damaging. Extremely stressful experiences can impair the activity of neuro-regulatory systems with lasting neuro- functional and behavioural consequences (Anda et al., 2006; Heim & Nemeroff, 2001; Teicher et al., 2003; Teicher et al., 2003)

Early stress is known to affect brain development, including synaptic overproduction and pruning, myelination, and neurogenesis during sensitive and specific periods (Teicher et al., 2003). Function and

structural neurobiological consequences of early stressful experiences have been shown (Teicher et al., 2003). Early stress is found to alter PFC development through precocious maturation and then a stunted final capacity (Teicher et al., 2003). EF and stress regulation have a reciprocal relationship. Individuals who have difficulty overriding behavioural tendencies and engaging in planning and organizing, and find themselves in situations of increased stress exposure, will have a diminished ability to handle these stressors, resulting in additional stress (Williams et al., 2009).

A wide array of risk factors put children at risk for developmental problems. One of these risk factors is CHT (Agaibi & Wilson, 2005). CHT has a wide array of negative effects on the developing child such as vulnerability to other stressors and poor learning of competencies in social behaviour (Agaibi & Wilson, 2005). Exactly how early stressors influence brain development is unknown, however we do know that HPA axis is affected and consequently dysregulated by CHT (Yehuda et al., 2010).

Through alteration of GC receptor responsiveness and cortisol signalling of the brain, early life stress is thought to reflect a unique neuroendocrine signature and a biological correlate of risk (Yehuda et al., 2010). Exposure to early stressors has been shown to lead to the persistent sensitization of the HPA axis and the central nervous system circuits which are involved in human stress regulation. CHT is believed to affect the developing HPA axis by sensitizing the brain to future stress reactions and making it hypersensitive to even minor stress reactions (Yehuda et al., 2010). This has been found to be true in studies that have assessed both abused children and adults that report CHT (Yehuda et al., 2010). A recent review of the literature on the effects of early stressors on brain development shows that early aversive experiences and the resultant stress response have profound effects on the developing brain resulting in impaired function of multiple brain structures and their functions (Anda et al., 2006; Teicher et al., 2003).

Stressful and aversive experiences such as CHT could ultimately lead to deficits in cognitive functioning in individuals with SAD and PTSD. HPA axis dysregulation has been widely researched in PTSD populations and dysregulation of the HPA axis has been implicated as significant in the initiation and continuation of

symptomatology in PTSD populations (Heim & Nemeroff, 2001; Yehuda et al., 2010). CHT has been found to change GC responsiveness during development and this is thought to underlie some of the changes in stress-responsiveness in PTSD (Yehuda et al., 2010).

It was previously mentioned that SAD populations report significantly higher rates of CHT compared to healthy controls. HPA axis dysregulation has been posited as an underlying mechanism. A recent pilot study has found support for this idea (Elzinga et al., 2010). The researchers examined whether individuals with SAD and CHT had increased cortisol reactivity in the context of a psychosocial stress paradigm. They compared nine individuals with SAD and CHT with nine individuals with SAD without CHT on HPA axis functioning (through salivary cortisol level measurements) before, during, and after exposure to the task. To enable investigation of the specificity of this relationship, a group with PTSD secondary to CHT ( $N= 16$ ) was added and all three groups were compared with a healthy control group ( $N= 16$ ). The researchers found that the SAD group with CHT had significantly higher cortisol reactivity compared to the other three groups indicating a hypersensitivity of the stress response in traumatized individuals with SAD (Elzinga et al., 2010).

## 2.5 CHT and cognitive functioning

CHT influences brain functioning through its altering influence on the developing stress response. Despite the importance of investigating the effects of CHT on the development of deficits in humans, little research has focused on its impact on brain development, structure and functioning (Elzinga et al., 2010). CHT is found to have a distinct relationship with later cognitive functioning. A recent pilot study found a significant relationship between CHT and later cognitive functioning suggesting a possible risk factor for CHT with regards to the later development of psychopathology (Majer et al., 2010). The researchers assessed 47 healthy adults who formed part of a larger study conducted in Wichita, KS, using the Cambridge Neuropsychological Test Automated Battery (CANTAB) in combination with the Wide- Range-Achievement-Test (WRAT-3) (Majer et al., 2010), and the Childhood Trauma Questionnaire (CTQ) (Bernstein & Fink, 1998) (discussed in detail in Chapter 4) to assess cognitive functioning and individual achievement with regards to type and severity

of CHT respectively. The researchers found that PN and EA might be associated with deficits in memory functioning. No significant relationships were found for EF and attention in this population (Majer et al., 2010).

The hippocampus, as has been mentioned, is particularly sensitive to damage caused by stress. Memory deficits in CHT have been found by Bremner et al. (1995). The aforementioned study assessed the short term memory capacity of 20 survivors of severe childhood sexual and physical abuse and 21 healthy controls and found significantly lower scores on the logical memory scales of the Wechsler Memory Scale for immediate and delayed recall in the CHT group. Deficits in verbal memory were associated with the severity of abuse. The authors concluded that trauma has long-lasting negative effects on verbal memory (Douglas Bremner et al., 1995).

Besides functional deficits, structural brain deficits in relation to CHT are also found. A study assessing childhood aversive events, ACC-, hippocampus-, amygdala- and caudate nucleus volumes in 265 healthy Australian men and women with regards to aversive childhood events (Cohen et al., 1996) found that individuals who reported more than two aversive events had significantly smaller ACC and caudate nucleus volumes compared to individuals with less aversive experiences. These effects were not found for hippocampal or amygdala volumes (Cohen et al., 1996).

## 2.6 Cognitive functioning in PTSD

Little is known about the exact aetiology of anxiety disorders. Research comparing the cognitive functioning of young adults with anxiety disorders (n= 75; age 21- 35 years old) with a group of 75 healthy controls found significant deficits in individuals with anxiety disorders (Castaneda et al., 2010). The authors found that adults with current anxiety disorders had poorer neuropsychological performance (verbal & visual memory, attention, EF, and psychomotor processing speed) on specific tasks (visual working memory). Interestingly, individuals with anxiety disorders who had low current psychosocial functioning and were taking psychotropic medication (both indications of greater symptom severity) had poorer neuropsychological performance on EF, processing speed and visual memory (Castaneda et al., 2010).

Recent advances in PTSD research have been made through the incorporation of cross-systems research that has included investigation of neurochemical, neuro-immunological, and neuroendocrine systems. PTSD research has been advanced through the inclusion of individuals with non-combat PTSD and the development of animal models of PTSD (Heim & Nemeroff, 2001). Besides HPA axis investigation, research on neurocognition and functional neuroanatomical substrates in PTSD show that dysregulation and structural anomalies are mostly confined to the amygdala, PFC, ACC and the hippocampus (Heim & Nemeroff, 2001).

Cognitive deficits in PTSD are most often found in immediate memory and attention (Horner & Hamner, 2002). EF deficits are also reported, however, to a lesser extent and findings in this domain have been inconsistent (Horner & Hamner, 2002). In line with models of PTSD that have implicated dysfunction in frontal- subcortical systems, specific deficits with regards to attention and memory have been documented (Vasterling, Brailey, Constans, & Sutker, 1998). The aforementioned researchers assessed 43 war veterans with and without PTSD on attention and memory performance and found deficits on sustained attention, mental manipulation, initial acquisition of information and retroactive interference (Vasterling et al., 1998). A later study found negative associations between cognitive functioning and PTSD severity, even after controlling for combat exposure and intelligence (Vasterling et al., 2002). Performance on attention, memory and learning was compared between 26 combat veterans with PTSD and 21 healthy controls. The researchers found that after controlling for frequency of combat exposure and intelligence, cognitive deficits were found on tasks of sustained attention, working memory, and initial learning ((Vasterling et al., 2002).

Similarly, a study by Koso (2006) found cognitive deficits in combat veterans (Bosnian Males) on EF, attention, and verbal memory in PTSD. The researchers assessed 20 PTSD positive and 20 healthy combat veterans and found large effects sizes pertaining to cognitive function deficits in the PTSD group. The deficits were found in verbal memory-, attention and EF functioning. These results were significant after controlling for intelligence and alcohol abuse (Koso & Hansen, 2006). A meta-analysis examining the literature on memory deficits in individuals with PTSD supports these findings (Johnsen & Asbjørnsen, 2008). The researchers assessed 28 studies for associations between PTSD and memory deficits. Medium effect sizes were found for



verbal memory deficits and PTSD confirming that verbal memory impairments are present in PTSD populations. Much of the existing research on cognitive functioning in individuals with PTSD has been conducted using emotionally salient cognitive tasks. However, a meta-analysis of 27 studies found that both verbal and visual memory for emotionally neutral information alone is also significantly affected in individuals with PTSD (Brewin, Lanius, Novac, Schnyder, & Galea, 2009). This analysis showed moderate effect sizes between PTSD and both visual and verbal memory for non-emotional information. These impairments were stronger for non-emotional verbal memory compared to non-emotional visual memory. These findings are consistent with neurobiological findings in PTSD (Brewin et al., 2009).

Besides functional abnormalities, structural abnormalities have also been found in PTSD populations. A meta-analysis of structural abnormalities of the hippocampus and other brain regions associated with PTSD, in trauma exposed and non-trauma exposed healthy controls, showed reductions in hippocampal volumes in the PTSD groups compared to trauma exposed and non-exposed groups (Karl et al., 2006). Furthermore, ACC volumes were found to be significantly smaller in the PTSD groups compared to the trauma exposed and non-exposed groups (Karl et al., 2006). The researchers concluded that PTSD and trauma exposed individuals have significantly smaller hippocampal and ACC volumes. However bilateral reductions in hippocampal volumes were only present in individuals with severe PTSD. Similarly another study found that structural abnormalities of the ACC are associated with PTSD (Woodward et al., 2006).

## 2.7 Cognitive functioning in SAD

Research available on cognitive functioning in SAD is extremely limited and mostly based on measurement of emotional deficits using emotionally salient tasks. Cognitive deficits have been found in SAD populations. A recent systematic review of the literature on biological mechanisms in SAD found that most studies have focused on amygdala dysfunction and dysregulation in SAD and less on other brain structures of possible interest (Ferreri, Lapp, & Peretti, 2011). Even though non-amygdala research in SAD populations is very limited, Ferreri and colleagues (2010) systematic review did find reduced functional alterations in PFC functioning (Ferreri et al., 2011). Of particular interest is that these same areas showed a decreased perfusion

after psychopharmacological and/or psychological interventions (Ferreri et al., 2011). As mentioned, a limitation of this up to date systematic review is that all of the reported research was based on studies that used emotionally salient tasks only.

Sachs et al. (2004) found reductions in event related potentials indicating deficits in speed and amount of perceptual and cognitive resources in SAD populations (Sachs et al., 2004). The researchers assessed 25 medication free SAD patients and 25 healthy controls on abnormalities of event related potentials (ERP's), using human scalp recorded electroencephalogram (EEG) as well as verbal learning and executive functioning in relation to ERP's. The researchers found that, compared to healthy controls, patients with SAD showed significant reductions in ERP's which related to verbal learning but not to executive functioning in this group. The researchers concluded that individuals with SAD show deficits in cognitive functioning as reflected by ERP's (Sachs et al., 2004).

## 2.8 Resilience

Resilience reflects the ability to maintain a stable equilibrium and is characterized by good outcomes to aversive experiences (such as trauma) that influence an individual's traits and/or states during these experiences, despite serious threats to adaptation or development, (Bonanno, 2004; Masten et al., 1999). From a psychological viewpoint, the construct resilience is based upon the observation that some individuals cope better than expected when exposed to extreme adversities (Tusaie & Dyer, 2004). Resilience is often noted as a possible explanation why some individuals develop problems due to trauma and others do not. However resilience is found to represent more than just the absence of vulnerability and/or symptoms of mental disorder (Friborg, Hjemdal, Martinussen, & Rosenvinge, 2009). The recent shift in focus, away from pathology and problem orientation, towards health promotion in clinical research has resulted in more awareness about the importance of resilience (Bonanno, 2004). Resiliency is thought to consist of a set of characteristics that are modifiable and intrinsic to the individual and offer protection in the face of stress (Hoge, Austin, & Pollack, 2007a). Furthermore, resilience is characterized by an identifiable pattern of thinking, decision making, and perceiving across different types of situations (Agaibi & Wilson, 2005). Positive emotions are an example of

resiliency (Ong, Bergeman, Bisconti & Wallace, 2006). In other words; resilience results from the operation of basic human adaptation. If this adaptation is in good working order development is robust even in the face of aversive experiences (Masten et al., 1999).

Resilience to aversive experiences can be established through many pathways and dimensions of individual traits and/or states and definitions in the literature range from the absence of psychopathology and the resumption of healthy functioning after facing extreme adversities, to surviving trauma, to recovery of a life threatening injury (Agaibi & Wilson, 2005). For the purpose of this study we used a resilience scale developed by Connor and Davidson (Connor & Davidson, 2003); called the Connor Davidson Resilience Scale (CD-RISC). This scale is a validated method for quantifying resilience in both general population and clinical samples (Connor & Davidson, 2003). The individual items of the CD\_RISC were derived from research-based characteristics of resilient individuals (Connor & Davidson, 2003) (see measures section).

Much of the literature investigating anxiety disorders has focussed on factors that increase risk. Far less research has focused on factors that may avoid these risks (Hoge, Austin, & Pollack, 2007), such as resilience. During the course of a lifetime most people will be exposed to at least one life-threatening or violent situation (Ozer, Best, Lipsey, & Weiss, 2003). Still in the light of extreme adversities, there are far fewer people who develop severe psychological problems as a consequence of exposure to these adversities than individuals who do not (Bonanno, 2004); suggesting that resilience may act as a protective buffer.

## 2.9 Resilience CHT, SAD and PTSD

CHT has been found to be a risk factor for the development of a wide array of psychopathology such as PTSD (Yehuda et al., 2010). This is believed to lead to an increased vulnerability to future stressors and decreased competence to cope effectively (Agaibi & Wilson, 2005). Indeed, actual or perceived incompetence in social behaviour has been shown to play a significant role in children, adolescents (La Greca & Lopez, 1998), and adults (Heimberg, 2001) with SAD. This suggests that resiliency may be compromised. To my knowledge, there are no studies that have examined resilience SAD. Known risk factors for SAD, such as low social

support, could compromise resilience and leave an individual vulnerable to developmental deficits (Agiabi & Wilson, 2005). Assessing the possible role of resilience in the face of past stressful life events and current SAD is, therefore, of great importance

## 2.10 CHT, PTSD and SAD

In summary, CHT is shown to affect HPA axis functioning in humans (Elzinga et al., 2010). This may, in turn, represent an increased vulnerability to subsequent stress and the development of psychopathology (Heim & Nemeroff, 2001). The literature suggests that specific cognitive deficits may underlie specific anxiety disorders. Expression of genotypic or phenotypic characteristics within individuals through these aversive experiences could potentially lead to the development of later psychopathology. Both human and animal research suggests that stressors influence brain development resulting in dysregulation ((Heim & Nemeroff, 2001). Cognitive dysfunctions can be classified as EF, attentional processes, memory, maladaptive cognitions and metacognition dysfunction (Ferreri et al., 2011); each of which may uniquely contribute to the maintenance or aggravation of anxiety disorders. Alterations in structural and functional properties of the brain have been identified in individuals with anxiety disorders and specifically in individuals with PTSD or SAD (Elzinga et al., 2010; Etkin & Wager, 2007; Karl et al., 2006; Mathew, Coplan, & Gorman, 2001; Mathews & MacLeod, 2005). Whether there are abnormalities that are unique to specific anxiety disorders remains unknown (Mathews & MacLeod, 2005).

Furthermore, with regards to the development of PTSD, a substantial amount of literature confirms that being more resilient may act as a protective factor in the face of aversive experiences (Agiabi & Wilson, 2005; Bonanno, 2004; Friborg et al., 2009; Hoge, Austin, & Pollack, 2007; King, King, Fairbank, Keane, & Adams, 1998; Luthar, 2003; Masten et al., 1999; Tusaie & Dyer, 2004; Waysman, Schwarzwald, & Solomon, 2001). This suggests that resilience can be seen as a sign of effective stress-coping ability in the light of aversive experiences. If this is also the case for individuals with SAD remains unknown.

## 2.11 Rationale of the study

In view of there being little known about the effects of CHT in SAD populations, this exploratory matched case-control study investigated the relationship between CHT, adult cognitive functioning, and resilience in relation to SAD and PTSD. A comparison of cognitive deficits in SAD and PTSD populations may provide insights into differential mechanisms that may underlie and aggravate SAD and PTSD symptomatology. Additionally little is known about the relationship between resilience and SAD and the specific contributions of different types of CHT to both PTSD and SAD. This research may provide helpful indicators for future research and for tailored interventional approaches.

### 2.12 Aims of the study

The main focus of this exploratory study was to compare and contrast the effects of CHT on cognitive assessment. This study was conducted in conjunction with an fMRI study by PhD student David Rosenstein (D. Rosenstein, Professor S. Seedat, study in progress) which aims to assess the genetic and neurobiological mechanisms of SAD in the context of CHT. Studies have found increased activity of the amygdala in individuals with PTSD and SAD (Andrews, Charney, Sirovatka & Regier, 2009; Bandelow & Stein, 2004). Amygdala activity in relation to CHT and SAD is the main focus of the study conducted by D. Rosenstein (in progress) and was therefore not further assessed in this study.

The main focus of this study was the assessment of EF, attention and memory in individuals with SAD and PTSD compared to healthy controls, in the context of CHT.

Secondary aims of this study were to assess for the role of resilience in individuals with PTSD and SAD, the role of CHT alone and the possible unique contributions of different types of trauma to SAD and PTSD. As part of this dissertation, a systematic review was conducted to examine the unique relationship between different types of CHT and SAD or PTSD. A better understanding of both CHT and resilience and their interacting influence is, therefore, of great interest.

### 2.13 Objectives of the study

The main objective of this study was to compare EF, attention and memory in individuals with

generalized SAD, PTSD and healthy controls, with regard to CHT. More specifically this study compared neuropsychological test findings of individuals with SAD and CHT, individuals with PTSD secondary to CHT, individuals with SAD without CHT and healthy controls.

The secondary objectives of this study were to examine the level of resilience between the groups (SAD with CHT, SAD without CHT, PTSD secondary to CHT, healthy controls) in relation to CHT. Furthermore the effects of CHT were assessed. Additionally the unique relationships between different types of CHT (SA, PA, EA, EN, and PN) and SAD or PTSD were examined. This aim was based on the outcomes of the systematic review, which shows that EA and EN are uniquely related to both SAD and PTSD.

#### 2.14 Hypothesis

The main hypothesis of the study was that individuals with SAD and CHT and individuals with PTSD secondary to CHT; (I) show more deficits in EF, memory and attention compared to individuals with SAD without CHT and healthy controls, and (II) have lower levels of resilience compared to individuals with SAD without CHT and healthy controls. Additional hypotheses were that (III) individuals with SAD and CHT and individuals with PTSD secondary to CHT show more deficits in EF, memory and attention compared to individuals without CHT and (IV) individuals with SAD or PTSD with CHT would endorse higher levels of both EA and EN.

## CHAPTER 3

### CHILDHOOD TRAUMA IN SAD AND PTSD: A SYSTEMATIC REVIEW

#### 3.1 Introduction

##### 3.1.1 CHT and maltreatment

The Convention on the Rights of the Child (UNICEF, 2011) spells out the basic human rights that children everywhere have the right to. These include survival; developing to their fullest; protection from harmful influences, abuse and exploitation; and full participation in family, cultural and social life. Within high income countries childhood maltreatment is still a substantial social welfare and public health problem. It is estimated that one in ten children annually are neglected or psychologically abused and 4%-16% are physically abused (Gilbert et al., 2008). In addition to major societal impacts, childhood maltreatment and neglect arguably have greater effects on an individual level.

We define childhood as the period of life between birth and puberty with a cut-off of 18 years of age. Accordingly, CHT is defined as any traumatic experience that a child endures up until the age of 18 that falls within one or more dimensions of the Childhood Trauma Questionnaire (CTQ). The five dimensions on the CTQ include sexual abuse (SA), physical abuse (PA), emotional abuse (EA), emotional neglect (EN) and physical neglect (PN) (Bernstein, Ahluvalia, Pogge, & Handelsman, 1997).

##### 3.2.2 Impact of CHT

The level of exposure to acutely dangerous events is a risk factor for later psychiatric symptoms that holds true even when controlling for the characteristics of the child, the social environment, and the nature of the traumatic event (Pine & Cohen, 2002). However, CHT as compared with other childhood aversive life events may be more salient in the development of anxiety disorders later in life (Hovens et al. 2010). The aforementioned authors assessed CHT in 1,931 participants in the Netherlands Study of Depression and Anxiety (NESDA). Childhood aversive events included divorce of parents, early parental loss and 'placed in care' whereas CHT comprised experience of PA, EA, SA and EN prior to the age of 16. The authors concluded that

CHT rather than childhood aversive events contributed to later-onset anxiety disorders. Similar results were found by Spinhoven et al. (2010), who conducted a study of depression and anxiety (NESDA) in the Netherlands and analysed the association between childhood adversities and negative life experiences across the lifespan in individuals with lifetime-based diagnoses of depression and anxiety, after controlling for comorbidity and the clustering of adversities. The authors reported that childhood adversities had a stronger association with affective disorders than negative life events across the lifespan (Spinhoven, et al., 2010).

A substantial body of research confirms the debilitating impact that CHT can have both in childhood and adolescence. For example, CHT is known to increase the risk for a variety of mental disorders in childhood and in later life, and has been shown to be a significant risk factor for the development of anxiety disorders (Holmes et al., 2005). Indeed, anxiety and behavioural disorders are significantly more common than mood disorders in children who have experienced CHT (Ackerman, Newton, McPherson, Jones, & Dykman, 1998). Ackerman et al. (1998) found, in a population of traumatized children, that a range of psychopathology co-morbid with PTSD was significantly more prevalent in children with both PA and SA compared to those with either PA or SA. Additionally, a younger age of onset of SA and coercion to maintain secrecy predicted a higher number of total diagnoses.

CHT experiences have also consistently been shown to affect the later development of psychopathology in adults. Stein et al. (1996) examined PA and SA in 125 patients with anxiety disorders (panic disorder, social phobia and obsessive-compulsive disorder) and found higher rates of abuse in patients with anxiety disorders compared to a community sample of adults. Indeed, CHT is a risk factor for the development of later psychiatric disorders, and may also contribute to earlier onset, increased co-morbidity, and to decreased efficacy of psychotherapeutic and psychopharmacological treatments (Brodsky et al., 2001; Friedman et al., 2002; Gladstone et al., 1999, 2004; Matza, Swensen, Flood, Secnik, & Leidy, 2004; McHolm, MacMillan, & Jamieson, 2003; Nemeroff, 2003; Zlotnick et al., 1994).

### 3.2.3 CHT in PTSD and SAD

A large body of research confirms that early CHT is a significant risk factor for the later development of



PTSD (Ballenger et al., 2004; Etkin & Wager, 2007; Bandelow et al., 2004). Indeed, Brewin, Andrews and Valentine (2000), in their meta-analysis of risk factors for PTSD, reported that childhood stressors and childhood abuse were some of the most significant variables determining the onset of PTSD in later life. In line with this, higher rates of CHT have also been reported by individuals with SAD (Safren, Gershuny, & Hendriksen, 2003; Chartier, Walker, & Stein, 2001). A retrospective study by Magee (1999) assessed the effects of different life experiences on the onset of multiple types of phobias. The researchers found chronic physical and verbal abuse during childhood was associated with the onset of SAD. Bandelow et al. (2004) assessed a small sample of patients ( $N=50$ ) with SAD and CHT and found a significant relationship between CHT and SAD. CHT was reported significantly more frequently in individuals with SAD compared with healthy controls. The Canadian Anxiety Disorders research program assessed 12 types of SA experiences (before age 18) ranging from fondling, through to genital touching, to vaginal and anal penetration (Stein et al., 1996). This study found that reports of SA were significantly more common in women with SAD than in healthy controls. Similar results were reported by Marteinsdottir, Svensson, Svedberg, Anderberg, and von Knorring, (2007) who investigated the relationship between life events and SAD in a Swedish sample ( $n= 30$  patients and  $n=75$  controls). Results showed that adversities, such as abuse during childhood, were significantly more frequent in the SAD group. In view of the paucity of studies relating different CHT types to the development of either SAD or PTSD, we undertook this systematic review.

### 3.3 Methods

#### 3.3.1 Aims

The review aimed to synthesize studies identifying the aetiological contributions of different types of CHT (SA, PA, EA, EN, and PN) to SAD and/or PTSD.

#### 3.3.2 Type of studies

The review included cohort/case control studies that delineated the effects of different types of CHT on psychopathology (SAD or PTSD or both) later in life. All studies were retrospective in design.

### 3.3.3 Inclusion and exclusion criteria

For a study to be included, it had to: (a) directly investigate the association between traumatic experiences and adult PTSD, SAD or both disorders, (b) distinguish trauma type (i.e. not just consider CHT homogenously); (c) delineate the aforementioned anxiety disorders; and (d) enrol adult participants. Dissertations, editorials, letters, and books were excluded.

### 3.3.4 Study selection

Studies were included if they were: (1) published in a peer reviewed journal; (2) available in full text; (3) electronically available in English; (4) available in at least one of the library databases identified for this review. All studies published up until December 2011 were included.

### 3.3.5 Search strategy/Library databases

Electronic databases included the Cochrane Library, Pubmed and PsychInfo. Two independent searches were conducted between November 2010 and December 2011 using a broad battery of search terms (emotional abuse, emotional neglect, physical abuse, physical neglect, sexual abuse, maltreatment, psychological abuse, psychological neglect, PTSD, Post traumatic stress disorder, Post-traumatic stress disorder, SAD, Social Anxiety Disorder, Social Phobia, Childhood, CHT). The reference sections of included articles were also scanned.

### 3.3.6 Quality appraisal

Two reviewers independently assessed the methodological quality of each study according to set criteria. The set criteria included: (1) sample size; (2) age of participants at the point of recruitment; (3) criteria or guidelines employed to assess data quality; (4) presence and quality of evidence reporting validity and reliability of measurement instruments; (5) consideration of potential confounding variables; (6) study outcomes (simple descriptive [e.g. prevalence] versus associational analyses). Studies were assessed by each reviewer independently using the aforementioned criteria and assigned into categories of good/fair quality and uncertain quality. A study was considered to be of fair quality if criteria 1-5 were met. All studies of fair quality were

included in this review. A study was considered to be uncertain quality if any one of the abovementioned criteria was not met. Studies of uncertain quality were not included.

### 3.3.7 Data extraction

The initial search yielded 36 references that appeared eligible from their title. If an article's eligibility was unclear from the title, the abstract was reviewed. On first screening, 26 references appeared eligible and the full text of these publications were retrieved. Of these publications, 9 were included for further review (Table 1) (Astin, Ogland-Hand, Foy, & Coleman, 1995; Becker, Stuewig, & McCloskey, 2010; Cogle, Timpano, Sachs-Ericsson, Keough, & Riccardi, 2010; Gibb, Chelminski, & Zimmerman, 2007; Kuo et al., 2011; Pederson & Wilson, 1997; Rodriguez, Ryan, VandeKemp, & Foy, 1997; Simon et al., 2009; Spertus, Yehuda, Wong, Halligan, & Seremetis, 2003). Reasons for exclusion of the 17 publications were (i) lack of clear differentiation of trauma type or disorder; (ii) lack of distinction of CHT type and other study outcomes; and (iii) failure to meet quality criteria (as above). Two reviewers independently extracted data using a specifically developed table. Data were collected on authors, sample size, population, age range, study design, study objectives, trauma assessment, measurement instruments, and findings (Table 1.)

### 3.3.8 Data analysis

This review made use of descriptive quantitative analysis combining measurement outcomes so as to provide a clear picture of the data. The reviewers pooled SAD and PTSD studies in alphabetical order (Table 1) in order to effectively compare the relationship of different types of childhood trauma to the onset of one or both disorders later in life.

Table 1

*Results*

Study	N /Population	Mean age range	Design/ Objective	Trauma type assessed/ Methods	Main findings/	Summary
Astin, Ogland-Hand, Foy, & Coleman, 1995	N=87, n=50 battered, n=37 marital distressed non-battered controls.  Battered women, residents or community clients, from one of five Los Angeles area shelters. To control for help-seeking status within the battered group non-battered women obtained from community clinics, therapists, and self-help groups in the Los Angeles area.	Participants were 18 years and older.	Retrospective  Do PTSD-positive women evidence significantly higher rates of childhood physical abuse/sexual abuse, and overall pre-battering traumatic experiences compared to PTSD-negative battered women?	Childhood Physical or Sexual abuse. Experiences of trauma assessed using screening section of the SCID-R. Previous traumatic experiences were established by asking participants to describe traumatic stressors using five distinct categories (childhood physical, childhood sexual, rape, criminal assault and other). Each of the categories was scored dichotomously and scores across categories were also summed to yield a cumulative score of multiple trauma. Each participant had five dichotomous. A diagnosis of PTSD was determined with the PTSD module of Spitzer and Eilliam's (1985) SCID-R (Structures Clinical Interview for <i>DSM-III-R</i> ).	According to the SCID-R. 58% were diagnosed PTSD positive among battered women. 18.9% of martially distressed women diagnosed positive for PTSD. PTSD levels were significantly higher in the Battered group compared to the martially distressed group $F(1, 85) = 34.14, p < 0001$ . 34% of battered women and 24.3% of martially distressed women reported childhood physical abuse. 42% of battered women and 48.6% of martially distressed women reported childhood sexual abuse. Whereas 34% of the battered women and 24.3% of the martially distressed women reported childhood physical abuse.  Significantly more PTSD positive women reported a history of childhood sexual abuse than PTSD negative women (86% vs. 40% respectively), $X^2(1, N = 37) = 4.75, p < .05$ , there were no such significant results for physical abuse.  Age was found significantly related to PTSD status $F(1, 48) = 3.92, p < .05$ .	A history of childhood sexual abuse clearly distinguished PTSD positive from PTSD negative women.  Even though high percentages for both physical and sexual abuse in childhood are reported by the battered women only sexual abuse is significantly related to PTSD symptoms.

*(continued)*

Table 1

*Continued*

Study	N /Population	Mean age range	Design/ Objective	Trauma type assessed/ Methods	Main findings/	Summary
Becker, Struewing & McCloskey, 2009	N=363, n= 193 with, & n= 170 without recent exposure to IPV. Abused women: battered women's shelters, public announcements across the city. Comparison: poster-campaign. Women self-identified as: Anglo-European (53.7%), Hispanic (mostly Mexican origin; 34.7%), African American (5.5%), Native American (4.4%), Asian/Pacific Island (1.1%), or of other ethnicity (0.6%).	$\bar{x}$ =32.9 (SD= 5.2)	Retrospective  (1) How do different forms of IPV (psychological, physical, escalated physical, and sexual) related to adult PTSD symptoms?  (2) How do different forms of childhood victimization (physical, sexual, and witnessing marital violence) relate to symptoms of PTSD?	Physical/ sexual abuse and witnessing marital violence growing up.  2-hr interview. Original Conflict tactics scale (CTS) was used to provide information about the various interpersonal violence and abuse experiences during adulthood and childhood.  CTS items were collapsed with additional items to produce  Scores for each domain measuring Psychological, Physical and sexual abuse and escalated physical abuse during adulthood, and Sexual, physical and witnessing marital violence. During the interview Women were asked if they recently experienced any hallmark symptoms of PTSD based on DSM-III-RV.	Different forms of childhood victimization were significantly interrelated (range .24 to .49). All forms of childhood victimization significantly related to adult PTSD symptoms.  IPV mediated the relationship between childhood physical abuse (Sobel's test $t = 3.01, p < .01$ ) and PTSD but not childhood sexual abuse (Sobel's test $t = .47, p = .64$ ) and PTSD.  IPV did not moderate and amplify the effect of child abuse.	Each form (of both adult IPV and childhood victimization) demonstrated similar bivariate relationships with PTSD.  High scores on childhood sexual and physical abuse related to higher PTSD symptomatology. However IPV mediated this effect for physical abuse whereas this was not the case for sexual abuse.  Sexual abuse had a direct effect on PTSD symptomatology over and above the effects of being in a current violent relationship.

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Table 1

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Study	N /Population /Mean age /Mean age range	Mean age range	Design/ Objective	Trauma type assessed/ Methods	Main findings/ Comorbidity/ gender differences	Summary
Cogle, Timpano, Sachs-Ericsson, Keough, & Riccardi, (2010)	N =4141 National Comorbidity Survey-Replication general population	age: $\mu$ =49.9 56% female	Retrospective  Examined the unique relationships between anxiety disorders and childhood physical and sexual abuse	Childhood sexual and/or PA  Structured interviews assessed the relationship between anxiety disorders and childhood sexual or PA, data from abuse history, lifetime psychiatric history, parental anxiety, and demographics.  The World Mental Health Survey Initiative version of the World Health Organization Composite International Diagnostic Interview (WMH-CIDI) was used to determine each respondent's lifetime history of psychiatric diagnosis including anxiety and mood disorders.	Controlling for depression, other anxiety disorders, and demographic variables, unique relationships were found between SA and SAD and PTSD. PA was only associated with PTSD. Among women PA was uniquely associated with PTSD. SA with SAD and PTSD. Among men both SA and PA was associated with SAD and PTSD.	Childhood SA is associated with SAD and PTSD  PA only associated with PTSD.

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Table 1

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Study	N /Population /Mean age range	Mean age range	Design/ Objective	Trauma type assessed/ Methods	Main findings/ Comorbidity/ gender differences	Summary
Gibb, Chelminski, & Zimmerman, 2007	N=857  Psychiatric outpatients evaluated as part of the Rhode Island Methods to Improve Diagnostic Assessment and Services (MIDAS) project. Of the sample: n=517 women, n=755 European American, n=347 married, n=535 completed some college education.	Average age: 38.36 years	Retrospective  Examined the specificity of childhood emotional, sexual or PA to depressive versus anxiety disorders	Childhood emotional, physical and SA  Structured clinical interview for DSM-IV Axis I Disorders-patient edition. All diagnostic raters were trained to reliability standards (3 month training during which they both observed and administered at least 20 interviews respectively).  Childhood Trauma Questionnaire (CTQ)	PTSD was related to all three forms of abuse. There were no significant differences in the magnitude of relations between PTSD and the three forms of abuse (lowest $P = .10$ )  SAD was more strongly related to reports of EA than to physical ( $z = 4.04, p < .001$ ) or sexual ( $z = 3.13,$ $p = .001$ ) abuse. In contrast there were no significant differences in the magnitude of relations between PTSD and the three forms of abuse (lowest $P = .10$ )	Where PTSD seems to be broadly related to childhood trauma (emotional, sexual and physical) SAD was only significantly related to EA

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Study	N /Population	Mean age range	Design/ Objective	Trauma type assessed/ Methods	Main findings/ Comorbidity/ gender differences	Summary
Kuo, Goldin, Werner, Heimberg, & Gross, 2011	N = 102, n = 53 (female) participants who met the DSM-IV-TR criteria for SAD. N = 30, n = 15 (female) healthy controls (HC). Exclusion criteria; current use of psychotropic medication/ history of neurological/ cardiovascular disorder or if they met criteria for any current DSM-IV Axis I psychiatric disorder assessed by the ADIS-IV-L other than generalized anxiety disorder. Recruitment; web-based community listings and referrals from local Mental health clinics.	SAD mean age, M = 33.47, HC mean age, M = 32.60.	Compare differences in the frequency (how often an event occurred) and rates (what percent of the time an event occurred) for different forms of CHT (SA, PA, PN, EA, and EN) in a sample of individuals with generalized SAD versus a comparison group of healthy control participants (HCs)	PA, PN, SA, EA, and EN all occurring during childhood. Childhood Trauma Questionnaire short form (CTQ-SF), Severity of social anxiety was measured using the Social Interaction Anxiety Scale (SIAS), Trait portion of the State-Trait Anxiety Inventory (STAI-T), Depressive symptoms were measured using the Beck Depression Inventory-II (BDI-II), Self-esteem was measured using the Rosenberg Self-Esteem Scale (RSES),	Compared to HCs, individuals with SAD reported greater frequency of EA (U= 816.00, p < .001), EN (U= 708.00, p < .001), and total CHT (U= 835.00, p < .001). There was a trend towards greater SA in the SAD group (U= 1289.00, p = .07). There were no significant between-group differences in PA (U= 1276.00, p = .14) or PN (U= 1258.50, p = .25). Individuals with SAD had greater rates of EA (U= 954.00, p < .001) and EN (U= 1077.00, p < .01). There were no significant between-group differences in rates of SA (U= 1362.00, p = .14), PA (U= 1320.00, p = .14), or PN (U= 1446.00, p < .32). Within the SAD sample, child EA and EN were positively correlated with current SAD. SA, PA, and PN were not correlated with SAD.	Compared to HCs, individuals with SAD report more frequent CHT, specifically, EA and EN. Furthermore, EA and EN were associated with current SAD.

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Study	N /Population /Mean age range	Mean age range	Design/ Objective	Trauma type assessed/ Methods	Main findings/ Comorbidity/ differences	Summary
Pederson, & Wilson, 2009	N = 207 women, Participant recruited from Springfield and the surrounding area in Clark Country, Ohio.	19 to 49 years (M = 26.5, SD = 6.7)	Retrospective  Examine the relationship between the severity of childhood emotional neglect and the development of PTSD and obesity in a community- based sample of women.	Histories of child abuse.  The Childhood Trauma Questionnaire to assess childhood maltreatment in five domains, emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect.  The Millon Clinical Multiaxial Inventory- Third Edition used to assess social function.  Demographic self-report questionnaire.	Participants who reported four or more forms of childhood abuse and neglect had significantly higher PTSD scores than did those who reported zero or three types of abuse and/or neglect ( $F_{5,201} = 27.82, p < .001; \eta^2_p = .41$ ).  When severity of other types of abuse and number of types were held constant, only severity of emotional neglect ( $F_{3,197} = 2.70, p < .05; \eta^2_p = .04$ ), severity of emotional abuse ( $F_{1,197} = 12.77, p < .0001; \eta^2_p = .06$ ), and severity of sexual abuse ( $F_{1,197} = 9.80, p < .01; \eta^2_p = .05$ ) had a significant effect on PTSD scores.	The severity of emotional neglect, emotional abuse and severity of sexual abuse had a significant effect on PTSD scores.  In this study women with a high severity of any type of childhood abuse or neglect were significantly more likely to have elevated PTSD scores compared to those without significant exposure to childhood abuse or neglect.

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Study	N /Population /Mean age range	Mean age range	Design/ Objective	Trauma type assessed/ Methods	Main findings/ Comorbidity/ gender differences	Summary
Rodriquez, Ryan, Vande Kemp, & Foy, 1997	N = 76, n = 45 women currently seeking help for SA, n = 31 To control for help-seeking status women were recruited from self-help groups and therapists in the greater Los Angeles area.	SA group $M = 35.3$ , $SD = 7.6$ .  Healthy controls $M = 38.7$ , $SD = 9.5$ .	Retrospective  Examine the effect of dual abuse (i.e. sexual and physical) on PTSD symptomatology in adult child sexual abuse survivors.	Dual abuse (childhood sexual and physical abuse).  Demographics and history included modified version of Veterans History Questionnaire; screening questionnaires regarding childhood adjustment problems and exposure to familial problems.  The Sexual Abuse Exposure Questionnaire measured SA. Assessing Environments III measured PA exposure.  Interviewed with the Structural Clinical Interview for DSM-III-R designed to assess for diagnostic criteria for variety of disorders from the revised third edition.	86.7% of the SA met full DSM-III-R criteria for SA-related PTSD compared to 19.4% of comparison group who met PTSD criteria for relationship distress that involve domestic violence. Difference in current PTSD rates between groups was significant, $\chi^2(1, N = 76) = 34.43, p < .001$ . 44.4% of the SA group and 19.4% of the comparison group had experienced severe physical abuse ( $\chi^2(1, N=76) = 5.13, p < .05$ ). Correlation analysis investigating relationships between the SA exposure variables of duration and force and lifetime showed a significant positive correlation with PTSD intensity; duration $r(45) = .33, p < .01$ ; force, $r(45) = .32, p < .05$ . Significant positive correlation also found between PA and PTSD intensity, $r(45) = .35, p < .01$ . These three variables were not significantly inter-correlated. Significant positive correlation was also found between PA and PTSD intensity in the SA group, $r(45) = .35, p < .01$ .	PTSD symptomatology was more common in the SA group compared to the healthy controls.  Both SA and PA exposure accounted for a significant portion of variance in PTSD intensity in the SA group.

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Study	N /Population	Mean age range	Design/ Objective	Trauma type assessed/ Methods	Main findings/ Comorbidity/ gender differences	Summary
Simon, Herlands, Marks, Mancini, Letamendi, Li, Pollack, Van Ameringen, & Stein, 2009	N=103 Treatment seeking individuals from three pharmacotherapy trials.	$\mu = 37$ (70% male). Participants aged 18 years and older	Retrospective  (1) Assessing the presence of sexual, physical and EA and neglect in treatment seeking individuals. (2) Examining the presence of physical, sexual, EA and neglect in individuals with generalized SAD.	Sexual, physical and EA  Childhood Trauma Questionnaire (CTQ) to measure childhood trauma, Liebowitz Social Anxiety Scale (LSAS) to measure SAD symptom severity. DSM-IV based semi structured Interview (MINI) was used to assess SAD symptom and severity. Symptom severity was also assessed using the Global Impressions of severity (CGI-s).	After controlling for age and gender significant associations were found between symptom severity and EN and abuse (LSAS, $p = .002$ ), 1.94% PTSD, 20.39% MDD, 7.77 PD, 26.21% GAD	EA and neglect during childhood were both associated with significant higher SAD symptom severity, poorer functioning resilience and Quality of life.

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Table 1

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Study	N /Population	Mean age range	Design/ Objective	Trauma type assessed/ Methods	Main findings/ Comorbidity/ gender differences	Summary
Spertus, Yehuda, Wong, Halligan, & Seremetis, 2003	N = 205 Hospital-based women's primary care practice in New York City.  80% were white, and 43% married. 65% classified themselves as working full-time, 80% reported 16- or more years of education.	19-82 years (mean 44.5, SD = 14 years)	Retrospective  (1) Examine the impact of childhood emotional neglect and abuse on psychological (depression, general anxiety and PTSD) and somatic symptoms.  (2) Examine the strength of these relationships after controlling for other types of childhood abuse and trauma.	Physical abuse, sexual abuse, emotional abuse and emotional neglect all occurring during childhood.  Childhood Trauma Questionnaire measured childhood trauma (physical, sexual and emotional abuse, physical and emotional neglect). Trauma History Questionnaire assessed a wide range of traumatic events.  Symptom Checklist-90R: the somatic, anxiety and depression scales of the SCL-90R were used to assess physical complaints and symptoms of anxiety and depression.  Revised Civilian Mississippi Scale for PTSD measure PTSD in civilians.	Sexual, physical and emotional abuse and emotional neglect all showed significant zero-order correlations with Post traumatic symptoms (PTS). There was a significant inter-correlation between the trauma dimensions.  Multiple regression analysis showed that, when partialling out the variance of sexual and physical abuse on PTS, emotional abuse and neglect predicted PTS significantly (partial correlations of .28 and .31 respectively)	Emotional abuse and neglect predicted adult psychopathology when partialling out the effect of sexual and physical abuse  Although emotional abuse and neglect do not fulfil the DSM-IV criterion A for PTSD, these experiences did in fact predict PTSD symptoms in this sample. This finding suggests that emotional neglect and abuse has the potential to predict PTSD given the exposure to subsequent events that do meet criterion A. To conclude, these findings suggest that not only more severe forms of abuse have adverse implications for adult health.

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### 3.4 Results

#### 3.4.1 Samples

Sample sizes ranged from  $N=76$  to  $N=4141$  and all studies were retrospective in design. Study populations were diverse and ranged from individuals in shelters in Los Angeles (Astin et al., 1995) to psychiatric patients in Rhode Island (Gibb et al., 2007), to residents from Springfield, Clark County Ohio (USA) (Pederson & Wilson, 2009) and New York City (Spertus et al., 2003), to individuals referred from self-help groups and therapists in Los Angeles (Rodriquez et al., 1997).

Information on the ethnicity of participants was sparse and, where mentioned, ranged from Anglo-European, Hispanic, Mexican, African American, Native American and Asian/Pacific Island (Becker et al., 2009) to European American (Gibb et al., 2007). Age varied greatly across studies and ranged from 18 to 82 years. Variations in demographic characteristics, age, recruitment strategy and sample size across studies made it difficult to establish generalizability.

#### 3.4.2 Diagnostic measurement

None of the studies used the same set or number of measures to ascertain diagnosis. Further, some studies assessed SAD/PTSD prevalence secondary to CHT (Astin et al., 1995; Gibb et al., 2007; Simon et al., 2009; Cogle et al., 2010) while other studies assessed SAD/PTSD symptom severity in conjunction with CHT severity (Becker et al., 2009; Kuo, Goldin, Werner, Heimberg, & Gross, 2011; Pederson & Wilson, 2009; Rodriquez et al., 1997; Spertus et al., 2003).

Diagnostic measures included the PTSD module of the Structured Clinical Interview for DSM-III-R (SCID-III) (Spitzer, Williams, Gibbon, & First, 1992), the Structured Clinical Interview for DSM-IV Axis I Disorders-patient edition (SCID-IV) (First, Spitzer, Gibbon, & Williams, 2002), the DSM-IV based semi-structured Mini International Neuropsychiatric Interview (MINI) (Sheehan et al., 1998), the Symptom Checklist 90 revised (SCL-90-R) (Derogatis, 1977), and the Revised

Civilian Mississippi Scale for PTSD (Norris & Parilla, 1996). Symptom severity was measured with the Clinical Global Impression of Severity scale (CGI-S) (Leucht, Kane, Kissling, Hamann, Etschel, & Engel, 2005). SAD presence and severity was measured with the Liebowitz Social Anxiety Scale (LSAS) (Heimberg et al., 1999).

Of the nine studies included, five used the Childhood Trauma Questionnaire (CTQ) to assess for CHT (Gibb et al., 2007; Kuo et al., 2011; Pederson & Wilson, 2009; Spertus et al., 2003; Simon et al., 2009); two studies used non-specific (structured) interviews and standardized questions to assess CHT (Astin et al., 1995; Cogle et al., 2010), one study used the Conflict Tactics Scale (Becker, 2010) and one study used the Sexual Abuse Exposure Questionnaire (Rowan et al., 1994) and the Environments III to assess SA (Berger Knutson, Mehm, & Perkins, 1984) and PA (Rodriquez et al., 1997).

### 3.4.3 CHT variables

Relationships between SA, PA, EA, EN and PN and the two anxiety disorders of interest (SAD, PTSD) were examined. Wide variations in sample size, study objectives, methodological procedures, measures of CHT, and comorbid conditions complicated the review. Only two studies assessed CHT variables in relation to both SAD and PTSD (Cogle et al., 2010; Gibb et al., 2007); other studies assessed CHT variables in relation to PTSD (Astin et al., 1995; Becker et al., 2009; Pederson & Wilson, 2009; Rodriquez et al., 1997; Spertus et al., 2003) or SAD (Simon et al., 2009; Kuo et al., 2011) only. Across studies, there was a lack of consistency with regards to the number and type of CHT variables assessed. For example, studies by Astin et al. (1995), Becker et al. (2009) and Rodriquez et al. (1997) examined both PA and SA in relation to PTSD; the study by Cogle et al. (2010) assessed PA and SA in relation to both PTSD and SAD (Cogle et al., 2010); the study by Gibb et al. (2007) assessed for both PTSD and SAD but across a wider range of CHT (PA, SA and/or

EA); and the studies by Kuo et al. (2011) and Simon et al. (2009) assessed all CHT variables but only with regards to SAD. Although the latter study (Simon et al., 2009) estimated SAD prevalence, it did so in the context of all CHT variables (SA, PA, EA, PN, and EN). The study by Spertus et al. (2003) investigated the effects of EA and/or EN in predicting PTSD after controlling for other types of CHT, whereas Pederson and Wilson (2009) examined the severity of EN in relation to the development of PTSD.

#### 3.4.4 Studies of CHT in PTSD

Astin et al. (1995) measured the prevalence of SA, PA and PTSD in 50 battered women and compared them to 37 maritally distressed women. Results showed that battered women had significantly higher rates of PTSD than maritally distressed women (58% vs. 18.9%). Of the battered women, 34% reported PA compared with 24.3 % of maritally distressed women. However, group differences were not significant and prevalence rates were also not significantly different between groups with and without PTSD (Astin et al., 1995). Battering exposure and SA predicted 37% of the variance in overall PTSD intensity levels. These results suggest that SA has a significant effect on the later development of PTSD (Astin et al., 1995). The relatively high rates of PA might indicate an inter-correlational effect with SA. A study by Becker et al. (2009) has found support for this hypothesis. The researchers assessed women with ( $n = 193$ ) and without ( $n = 170$ ) recent exposure to intimate partner violence (IPV) and past exposure to child abuse (SA and PA) and self-reported PTSD symptoms. Results indicated that SA and PA were highly inter-correlated and were both associated with adult PTSD symptoms. Intimate partner violence (IPV) mediated the relationship between PA (Sobel's test  $t = 3.01$ ,  $p < .01$ ) and PTSD although it did not mediate the relationship between SA (Sobel's test  $t = .47$ ,  $p = .64$ ) and PTSD. Furthermore, IPV did not moderate nor amplify the effect of child abuse.

A study by Rodriguez et al. (1997) further supports a possible mediating effect of PA on later PTSD. This study compared symptoms of PTSD in a group of 45 adult women in outpatient treatment for SA and a group of 31 women who reported no SA. The researchers explored the potential traumatic impact of dual abuse (SA and PA). Results of standardized assessments showed that 86.7% of the SA group met criteria for current PTSD compared to 19.4% of the healthy controls ( $\chi^2(1, N = 76) = 34.43, p < .001$ ). 44.4% of the CSA group and 19.4% of the comparison group had experienced severe PA ( $\chi^2(1, N = 76) = 5.13, p < .05$ ). PTSD was significantly positively correlated with the intensity of domestic violence (duration  $r(45) = .33, p < .01$ ; force,  $r(45) = .32, p < .05$ ). A significant positive correlation was also found between PA and PTSD intensity, ( $r(45) = .35, p < .01$ ). Even though these results provide support for SA as a potential etiological agent, 89% of the SA survivors also reported PA. Multivariate analysis revealed that both SA and PA exposure variables accounted for a significant proportion of the variance in PTSD symptoms in the SA group (Rodriguez et al., 1997).

In summary SA has been shown to be significantly associated with PTSD. However, individuals suffering from PTSD also report high rates of PA. Studies controlling for the effects of SA show that PA is a significant contributor to PTSD symptomatology later in life. A point of critique is that the influence of other abuse experiences such as PN, EN and EA was not examined in the above studies. Spertus et al. (2003) assessed 205 hospital-based women from primary care practices in New York City. The researchers examined the impact of childhood EN and EA on PTSD after controlling for other types of CHT. Results showed that SA, PA, EA and EN all had significant zero-order correlations with posttraumatic symptoms (PTSS). There was also significant inter-correlation among these trauma dimensions (Spertus et al. 2003). However, multiple regression analysis showed that when partialling out the variance of SA and PA on PTSS, EA and EN significantly predicted



PTSS (partial correlations of .28 and .31 respectively). This indicates that even though both SA and PA have strong associations with PTSD symptomatology, EA and EN have significant effects too.

Similar findings were documented by Pederson and Wilson (2009) who investigated SA, PA, EA, EN and PN. This study primarily investigated the relationship between EN severity and the development of PTSD and obesity in a community-based sample of 207 women. Results showed that severity of EN, EA and the severity of SA had a significant effect on PTSD symptomatology. When the severity of other types of abuse, and the number of CHT types were held constant, only the severity of EN ( $p < .05$ ), the severity of EA ( $p < .001$ ), and the severity of SA ( $p < .01$ ) had significant effects on PTSD symptomatology. In this study women with a high severity of any type of CHT were significantly more likely to have elevated PTSD scores compared to those without significant exposure to CHT (Pederson & Wilson, 2009).

In summary, SA has a strong association with the development of later PTSD symptomatology. Other dimensions of CHT have weaker relationships with later PTSD symptomatology. It is notable that once the effects of SA are controlled for the effects of PA, EA, and EN significantly influence PTSD symptomatology.

#### 3.4.5 Studies of CHT in SAD

A study by Simon et al. (2009) assessed 103 treatment-seeking individuals from three pharmacotherapy trials. Using the CTQ, among other standardized measures, the researchers assessed the presence of sexual, physical, and emotional abuse and neglect. Results showed that 70% met threshold severity criteria for at least one type of childhood abuse or neglect. After controlling for age and gender, significant associations were found between SAD symptom severity and EN and EA,

respectively (both EA and EN;  $p = .002$ ). None of the other subscales showed significant associations (Simon et al, 2009).

A study by Kuo et al. (2011) investigated the relationship between the intensity and severity of SA, PA, EA, EN and PN and SAD severity. Compared to healthy controls (HC), individuals with SAD reported greater frequency of EA ( $U = 816.00$ ,  $p < .001$ ), EN ( $U = 708.00$ ,  $p < .001$ ), and total CHT ( $U = 835.00$ ,  $p < .001$ ). There was a trend towards greater SA in the SAD group but no significant between-group differences in PA or PN. Individuals with SAD had higher rates of EA ( $U = 954.00$ ,  $p < .001$ ) and EN ( $U = 1077.00$ ,  $p < .01$ ) compared to HC.

In summary individuals with SAD report high rates of CHT. Both EA and EN are reported significantly higher in these individuals compared to other CHT variables. Furthermore, there seems to be a trend toward significance regarding the specific influence of SA on SAD symptomatology. Thus, while data on the specific influence of CHT types on SAD symptomatology are limited, results indicate a link between childhood EA, EN, (and possibly SA) and SAD.

#### 3.4.6 Studies examining both SAD and PTSD

A study by Cogle et al. (2010) assessed 4141 individuals as part of the *National Comorbidity Survey- Replication* population-based study in the United States. This study examined the unique relationships between anxiety disorders, including SAD and PTSD, and childhood PA and SA. After controlling for depression, other anxiety disorders, and socio-demographic variables, significant associations were found between SA and SAD and PTSD ( $p < 0.01$ ). A significant association was found between PTSD and PA ( $p < 0.01$ ) (Cogle et al., 2010). A study by Gibb et al. (2007) assessed for CHT in 857 psychiatric outpatients who were evaluated as part of the *Rhode Island Methods to Improve Diagnostic Assessment and Services (MIDAS)* project (Gibb et al., 2007). The researchers

examined the specificity of childhood EA, SA, or PA for depressive- versus anxiety disorders. The results showed that PTSD was related to all three forms of CHT with no difference in the magnitude of effect across the three abuse types (lowest  $p = .10$ ), whereas SAD was more strongly associated with EA than PA ( $z = 4.04, p < .001$ ) or SA ( $z = 3.13, p < .001$ ) abuse (Gibb et al., 2007).

In summary most studies have focused their investigation on the effects of SA and PA in relation to SAD and PTSD aetiology, rather than on EA and EN which have recently been shown to have significant associations with both SAD and PTSD (Pederson et al., 2009; Spertus et al., 2003; Simon et al., 2009).

### 3.5 Discussion

SA in childhood is significantly associated with PTSD in adulthood. Individuals suffering from PTSD also reported high rates of PA. From our review we conclude that when the effects of SA are controlled for, PA is a significant contributor to PTSD symptomatology later in life. Other dimensions of CHT (PA, EA, EN) have similar but weaker relationships with later PTSD symptomatology, however their mediating effects on the development of PTSD and on PTSD symptom intensity requires further elucidation.

The various studies reviewed here indicate that individuals with SAD endorse high levels of CHT. Of particular interest are the significantly high levels of EA and EN. Data on CHT in individuals with SAD is limited, however the findings are in line with findings in PTSD; a high overall prevalence of CHT and specifically the presence of EA and EN in adult SAD. Furthermore a weaker but substantial association has been shown between SA and adult-onset SAD.

A major limitation of the reviewed literature was the lack of extensive and detailed examination of CHT across a variety of cultural settings, with most studies conducted in American

samples. A further limitation, and a reason for exclusion of a number of studies, was the lack of standardized instruments for assessing CHT in PTSD and SAD. All studies included in this review were of a retrospective nature and relied on the accurate reporting of past events. Memory, however, is also not always reliable in eyewitness reports and retrospective accounts of significant life events (Loftus & Pickrell, 1995). This is a major concern since the dysregulation of memory in individuals with PTSD impacts on their ability to provide accurate historical information. Thus, memory deficits make it difficult to determine the accuracy of past reports, and influence the clarity of past experiences (Dickie, Brunet, Akerib & Armony, 2008).

Clearer definitions of CHT types, consensus on these definitions, and the use of uniform measurement instruments across studies will facilitate more reliable cross-sectional and longitudinal investigation of the possible etiological effects of CHT on the development of PTSD and SAD. Longitudinal studies that track the relationship between CHT types and subsequent development of psychopathology are particularly crucial. Current evidence, albeit limited, can inform prevention-focused interventions. For example, sexual abuse appears to have a consistent relationship to adult PTSD. Interventional work in youth aimed at preventing future PTSD should focus management on this particular trauma (without the explicit exclusion of other early traumas).

## CHAPTER 4

### RESEARCH METHODOLOGY

#### 4.1 Research design

This study was an exploratory matched case-control study consisting of four groups.

#### 4.2 Participants

A total of 44 participants were selected through convenience sampling. Based on screening, diagnostic and behavioural assessment (detailed description in section 4.4.2), participants were categorised into three clinical groups (with either a primary diagnosis of SAD or PTSD) and a healthy control group.

The first group consisted of participants with SAD who had experienced CHT. The second group consisted of participants with SAD without CHT. The third group acted as a comparison group and consisted of participants diagnosed with PTSD secondary to CHT. The fourth group consisted of healthy participants who had been matched on socio-demographic variables with the other three groups. Matching of participants was conducted with careful attention to demographic characteristics of the sample in order to avoid measurement errors and large between-subject errors.

#### 4.3 Procedure

Permission to conduct research and ethical clearance was obtained from the University of Stellenbosch Health Research Ethics Committee at Tygerberg Campus. After clearance was obtained, participants were recruited through referrals from psychiatrists and psychologists in the Western Cape (contact details of clinicians were provided by the Mental Health Group database at Tygerberg Campus). Furthermore, the Cape Town Trauma Centre and the South African Depression and Anxiety Group (SADAG) assisted in recruitment through placement of advertisements in their monthly newsletters and contact of possible participants with PTSD and SAD through their databases

and support groups (study information given out to participants and/or health professionals can be found in Appendix A-1 and 2). Further recruitment methods consisted of convenience sampling through plasma screen advertisements (Stellenbosch University Tygerberg Campus plasma screens at the main entrance; Appendix A3), local anxiety disorder support groups in the Cape Town area, and the principal researcher's website ([www.rosenstheintherapy.com](http://www.rosenstheintherapy.com)).

Contact information of individuals who showed an interest in participating were forwarded to a research assistant telephonically or by e-mail (telephone screening interview can be found in Appendix B1). The research assistant screened these individuals after obtaining their consent. This was followed by a standardized screening form of demographic details and medical history (Appendix B2). After eligibility was established by the research assistant and interest to participate was expressed by the participant, an appointment was made for the first visit at Tygerberg Campus.

At the first visit, informed consent (Appendix B3) was obtained and a full diagnostic assessment followed (detailed description of the assessments can be found in section 4.4). Once the diagnostic interview- the Mini International Neuropsychiatric Interview (MINI, Sheehan et al., 1998; Appendix C1) had been completed, the self-report Liebowitz Social Anxiety Scale (LSAS; Appendix C3) (Baker, Heinrichs, Kim, & Hofmann, 2002), the Clinician Administered Posttraumatic Stress Disorder Scale (CAPS; Blake et al., 1990; Appendix C2), the Connor Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003; Appendix D2), and the and the Childhood Trauma Questionnaire (CTQ) (Bernstein & Fink, 1998; Appendix D1) were administered to screen all subjects for symptoms of social anxiety and PTSD, levels of resilience, and experience of CHT respectively (detailed descriptions of the measures can be found in section 4.4). After the first visit, eligibility to proceed with participation in the study was determined.

Exclusion criteria included a previous diagnosis of any neurological disorders, Axis II

disorders or any psychotic disorders according to the DSM-IV-R (American Psychiatric Association, 2000). Furthermore reported drug abuse/dependence (prescription and/or other) or alcohol abuse/dependence led to exclusion of the study. Cannabis users were included provided that there was a minimum of two weeks of complete abstinence prior to study entry.

If a participant was found to be eligible the second visit followed upon appointment or directly after the first visit, depending on the participant's personal wishes and researcher availability. The second visit consisted of a neuropsychological test battery (see Appendix E for the paper administered measures; a complete description of the measures can be found in section 4.4.6 below). Neuropsychological testing was conducted according to a protocol (Appendix E1) which was followed meticulously for every participant. After both visits were completed the participant was thanked for participation and reimbursed for travel expenses. After the sample of clinical individuals had been recruited and assessed, healthy controls were recruited. The healthy controls were recruited through Tygerberg Campus colleagues and personal contacts.

#### 4.4 Measurements

All measures were administered in English and all 44 participants underwent the same diagnostic assessments, completed the same self-report psychopathology questionnaires and neuropsychological test battery. Healthy controls were assessed using the exact same criteria to determine true non- cases and were matched to the other three groups based on age, years of education, gender, ethnic background, and handedness.

##### 4.4.1 Demographic variables

Gender, age, ethnicity, years of education, and handedness were all assessed with a self-administered demographic questionnaire (Appendix A-2).

#### 4.4.2 Diagnostic measures for PTSD and SAD

Psychiatric diagnostic assessments were conducted by a clinical psychologist using the Mini International Neuropsychiatric Interview (MINI; Sheehan et al., 1998). The MINI is a semi-structured clinical interview based upon both the Diagnostic and Statistical Manual of Mental Disorders, third edition, Revised (DSM-III-R; APA, 1994) and later the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV; APA, 2000) and the International Classification of Diseases (ICD) (WHO, 1992) diagnostic criteria for mental disorders (Sheehan et al. 1998). The MINI is used to determine major psychiatric disorders and takes approximately 20 minutes to complete (Appendix C1).

Good inter-rater and test-retest reliability was found by Lecrubier et al. (1997). Research found sensitivity of between 0.75 and 0.92 and specificity between 0.90 and 0.99. Furthermore Kappa coefficients range from between 0.65 and 0.85, and positive predictive and negative predictive values from between 0.60 and 0.86 and 0.92 and 0.99, and accuracy of between 0.88 and 0.98 (de Azevedo Marques & Zuardi, 2008).

#### 4.4.3 Symptom severity and frequency of PTSD and SAD

Subjects diagnosed with SAD or PTSD were screened by a clinical psychologist for severity and frequency of symptoms. Individuals with PTSD were screened with the Clinician Administered Posttraumatic Stress Disorder Scale (CAPS; Blake et al., 1990) and individuals with SAD were screened with the Liebowitz Social Anxiety Scale (LSAS) (Baker et al., 2002) (Appendix C2 and 3 respectively).

The Liebowitz Social Anxiety Scale (LSAS) assesses SAD and discriminates between generalized SAD and specific SAD (Baker et al., 2002; Mennin et al., 2002). This clinician administered self-reported questionnaire assesses current social anxiety disorder through 24 questions



on a 4 point likert- scale. Items are composed of social activities (e.g. going to a party) and two self-rated social anxiety components (fear/anxiety and avoidance). Each item is self-scored on a likert scale of severity, ranging from 0 (none) to 3 (severe) for the fear/anxiety component and 0 (Never (0%)) to 3 (Usually (67-100%)) for the avoidance component.

A psychometric evaluation of the LSAS showed good test-retest reliabilities of the LSAS total score ( $r = 0.83$ ,  $p < 0.01$ ) and the fear/anxiety and avoidance sub scores ( $r = 0.79$ ,  $p < 0.01$ , and  $r = 0.83$ ,  $p < 0.01$ , respectively) (Baker et al., 2002). Based upon a psychometric study, an LSAS cut off score of  $\geq 60$  establishes whether a participant qualifies for SAD or not (Safren et al., 1999).

For the measurement of frequency and severity levels of PTSD, the Clinician Administered Posttraumatic Stress Disorder Scale (CAPS) (Blake et al., 1995) is considered as the 'gold standard' in PTSD outcome studies (Blake et al., 1995) (Weathers, Keane, & Davidson, 2001). The CAPS is a widely acceptable interview-based rating scale for PTSD which enables the assessment of separate PTSD aspects. The CAPS assesses the presence (Criterion A1) and magnitude of affect experienced due to the traumatic event (Criterion A2) and further assesses for one or more symptoms of re-experience, three or more symptoms of avoidance, and two or more symptoms of hyper arousal (Criterion B - D respectively). If these symptoms cause the individual significant distress (Criterion F) and have lasted at least one month (Criterion E) a diagnosis for PTSD can be made (APA, 2000).

The CAPS can either be used as a dichotomous diagnostic tool or as a continuous measure of symptom severity. It can be also be used as a separate measure of PTSD symptom intensities and frequencies that have been experienced over the past week, the past month and over a lifetime. Together, intensity and frequency scores can be summed to represent a total severity score (D. D. Blake et al., 1995).

The CAPS provides frequency scores (e.g. 'How often do you experience distressing dreams?')

on a five point likert scale from 0 = never to 4 = daily) and severity scores (e.g. 'How intense do you perceive these dreams?' on a five point likert scale 0 = none to 4 = extreme) with regard to individual PTSD symptoms. Although there is overlap with the MINI, this test specifically measures frequency and severity in comparison to yes/ no answers to events happening (D. D. Blake et al., 1995). Cross-cultural research shows that the test has high reliability with a coefficient alpha of 0.92 and strong convergent validity with instruments measuring depression, anxiety and levels of psychosocial functioning using cut off scores of  $\geq 50$  more (Charney & Keane, 2007). For the purpose of this study a total score of 50 or higher identified those suffering from PTSD.

#### 4.4.4 Childhood Trauma

CHT was measured using the quantitative short form of the Childhood Trauma Questionnaire (CTQ- SF) (Bernstein & Fink, 1998; Appendix D1). The CTQ-SF is a self-reported and psychometric retrospective measure of childhood abuse and contains 28 self-administered questions on a five-point likert scale and takes approximately 5-10 minutes to complete (Bernstein, Ahluvalia, Pogge, & Handelsman, 1997). Furthermore each question assesses the degree to which an individual agrees with a specific aspect or factor of developmental trauma (1= never true – 5= very often true; Bernstein et al., 1997).

The CTQ, a self-report measure, consists of five dimensions of childhood maltreatment consisting of five questions each. These are physical abuse (e.g. 'people in my family hit me so hard that it left bruises or marks'), physical neglect (e.g. 'I didn't have enough to eat'), emotional neglect (e.g. 'there was someone in my family who helped me feel important or special'), sexual abuse (e.g. 'someone tried to touch me in a sexual way, or tried to make me touch them') and emotional abuse (e.g. 'people in my family called me things like 'stupid', 'lazy', or 'ugly'). Of the 28 items 3 items made up a minimization/denial scale which was designed to detect false-negative trauma reports (e.g.

'there was nothing I wanted to change about my family'). For each score of five on the likert scale (very often true), one point is assigned. Total scores of 0-1 are acceptable whereas scores of 2-3 gives an indication of response bias resulting in exclusion from further analysis of these CTQ results (Bernstein et al., 1997).

The CTQ has demonstrated good reliability (test-retest reliabilities ranging from .79 to .86) and internal consistency reliabilities (ranging from a median of .66 for the physical neglect subscale to a median of .92 for the sexual abuse subscale) (Bernstein & Fink, 1998). Moreover, results from a sample of racially mixed individuals showed internal consistency reliability rates for the entire measure ( $\alpha = .91$ ) and four of the subscales. Alpha coefficients for the five subscales were in descending order  $R = .94$  (sexual abuse),  $R = .85$  (emotional neglect),  $.83$  (emotional abuse),  $R = .69$  (physical abuse) and  $R = .58$  (physical neglect) (Scher, Stein, Asmundson, McCreary, & Forde, 2001).

To make a clear distinction between childhood traumatization of individuals versus non-traumatization the interpretation guidelines suggested by Bernstein & Fink (1998) were used. The total score of the CTQ-SF is placed into one of four subscales which are: 'none to minimal trauma' (scores 25-36), 'low to moderate trauma' (scores 41-51), 'moderate to severe trauma' (scores 56- 68) and 'severe to extreme trauma' (scores 73-125) (Bernstein et al., 1997; Bernstein & Fink, 1998). Even though exact figures of childhood traumatised are unavailable for the South African population, higher exposures to CHT can be expected in South Africa in comparison to western civilizations due to its records of violence, its political history and socio-economic status (Seedat, Van Niekerk, Jewkes, Suffla, & Ratele, 2009).

In the South African population where trauma is endemic, it was decided to use a score range of 25 to 40 to delineate non-traumatized individuals, and 46 to 125 to delineate traumatized individuals. To make a clear distinction between traumatized and non-traumatized individuals all

participants with scores between 41 to 46 were excluded, which, according to the scoring convention of the CTQ manual, can be considered as a score range which characterises moderately traumatized individuals (Bernstein et al., 1997).

#### 4.4.5 Resilience

In order to assess levels of resilience, participants were asked to complete the Connor Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003; Appendix D2). The CD-RISC is a self-report measure of resilience consisting of 25 items. The scale rates participants over the past month (e.g. I can handle unpleasant feelings) with a total score of the CD-RISC varying from 0- 100, with higher scores reflecting higher resilience. The items are scored on a 5 point likert scale (0= 'not at all true' till 4 = 'true nearly all of the time'). Psychometric evaluation of the CD-RISC conducted on clinical and general population samples has found the measure to have good psychometric properties, good internal consistency and test-retest reliability ( $r = .87$ ) (Connor & Davidson, 2003).

#### 4.4.6 Cognitive functioning in SAD and PTSD

The neuropsychological tests were administered using the neuropsychological test battery protocol and were conducted by the MA Psychology candidate S. Bakelaar (see Appendix C for the neuropsychological test protocol and the paper administered measures).

##### 4.4.6.1 Memory

The *WMS III* (Lezak, 2004; Wechsler, 1945) is a neuropsychological test of learning and memory. It assesses both auditory and visual memory, and examines temporal aspects of memory (Lezak, 2004). The *WMS III* consists of a core battery of six memory tests, which comprise various memory indices. The core memory tests generate eight indices of memory, these include: Auditory Immediate, Visual Immediate, Immediate Memory, Auditory Delayed, Visual Delayed, Auditory Recognition, Delayed, General Memory and Working Memory (Lezak, 2004). Reliability coefficients

are good and range from .82 to .93 for the WMS III (Lezak, 2004). Confirmatory analysis has shown the verbal memory component best fits with the immediate and delayed trials of the logical memory and associate learning tasks (Price, Tulsky, Millis, & Weiss, 2002).

The Associate Learning Task (PAL; Lezak, 2004) consists of ten word pairs of which six pairs are considered 'easy' (e.g.: up- down) and four are considered 'hard' (e.g.: school- grocery). The ten word pairs are arranged in three columns of different sequences. The columns are each read and followed by an immediate recall trial after each executive reading (Lezak, 2004; Appendix C-2 and 4). Both the immediate and delayed trials (Appendix E2 and E4) are scored by summing one- half the sum of correct 'easy' pairs, adding the sum of the 'hard' pairs, given correct by the participant within 5 seconds after the word pairs are read. The delayed trial is administered 20 minutes after the last immediate recall trial (Lezak, 2004). Reliability for the PAL was found to be satisfactory (Lezak, 2004)

Like most story memory tasks the Logical Memory (LM-O; Lezak, 2004; Appendix E3 and 5) is administered by reading out a story which is followed by a recall of what was read by the participant (Lezak, 2004). The LM-O consists of two stories; story A and B. These are read one after the other and scored by summing each of the correctly recalled sections of each story (total of 25 items per story) (Lezak, 2004). Reliability for the LM-O was found to be satisfactory (Lezak, 2004)

#### 4.4.6.2 Attention

The *Stroop Colour Word Task* (Appendix E6) is a test of selective attention, processing and flexibility which became one of the most popular neuropsychological measures in the late 20<sup>th</sup> century (Lezak, 2004; Appendix C-6). This task is based upon the knowledge that it takes longer to name a colour (e.g. a printed coloured ink) that is presented than to read a colour word (e.g. the word RED). This difference in processing speed becomes evident when a series of colour words are printed in an

incongruent colour of ink (e.g. the word RED in blue ink), and a person is asked to name the colour of the ink and ignore the word as fast as possible (Lezak, 2004). There are several forms of the Stroop task but for the purpose of this study the *Stroop Colour Word Task* was used (Lezak, 2004). This task is administered in three trials. In the first trial a list of colour words is presented (e.g. RED, BLUE, GREEN printed in black ink) and the participant is asked to read as many words as possible in 45 seconds. The second trial consists of a column of different Coloured ink (RED, GREEN, BLUE ink) and again the participant is asked to name the colours as quickly as possible in 45 seconds. The last trial consists of columns of coloured words printed in incongruent colours (e.g. RED printed in BLUE ink). The first two trials act as a baseline for reading speed and naming speed. The third trial acts as a measure of interference with respect to reading and naming speed. The Stroop Colour Word task has a satisfactory reliability (Lezak, 2004)

#### 4.4.6.3 Executive Functioning

The Wisconsin Card Sorting Test Computer Version 4–Research Edition (WCST: CV4) (Heaton & Psychological Assessment Resources, 2003) is a computer assisted task that assesses “shift in set” and abstract behaviour. Computerized tasks increase reliability and research shows that the WCST: CV4 is a reliable substitute to the manual administration of this test (Tien et al., 1996). The WCST: CV4 follows the same principal as the manually administered task (Strauss, Sherman, & Spreen, 2006). The participant is shown between 64 to 128 cards, showing four symbols – a triangle, star, cross or circle – in four colours – red, green, blue or yellow on a computer screen. No two cards are identical. The task for the participant is to place the cards one at time under one of four stimulus cards on the computer screen by pressing one of the four keys representing the target cards. The participant has to deduce from the screen, the pattern of the specific placement order of the cards. The

placements of cards are set by one of three specific target stimuli (colour, symbol or number of symbols on each card). The computer program gives feedback in the form of right or wrong for each placement, without explicitly stating the target stimuli, which should give an indication of the correct set following the principal of trial and error (Lezak, et al., 2004). Reliability and validity of this task is satisfactory (Strauss et al., 2006).

#### 4.5 Statistical Analyses

The significance levels for all analyses was set at a 95% confidence interval ( $p=.05$ ). The groups were matched on demographic variables (age, gender, education, ethnicity and handedness). ANOVA and chi-square tests were used, where appropriate, to ensure that no group differences with regards to the demographic variables were present ( $p>.05$ ). Whilst there were no significant differences found between the two SAD groups (SAD+ and SAD-) with regards to LSAS total and subscale scores, high LSAS scores were found for the PTSD group. It was, therefore, decided to use ANCOVA in subsequent group analyses enabling the comparison of group outcomes whilst controlling for high social anxiety levels. A one-way ANOVA was used to test for statistical differences in reported resilience between the four groups. Since the four groups significantly differed from each other with regards to resilience a regression analysis of the cognitive assessments (dependent) and resilience total scores (independent) was used to test the influence of resilience in the cognitive outcomes. Independent student t-tests were used to enable separate analysis of the effects of CHT.

## CHAPTER 5

### RESULTS

#### 5.1 Introduction

This chapter will discuss the demographic characteristics of the study sample, followed by a discussion of group effects (table 2 and 3). This is followed by a discussion of cognitive and resilience outcomes (table 4). This is followed by a separate comparison of the cognitive measurement outcomes in the sample in relation to CHT (traumatized individuals vs. non-traumatized individuals, excluding the healthy controls). These outcomes are displayed in table 5.

##### 5.1.1 Descriptives

All analyses were conducted with a total sample of 44 individuals. More than half of the participants were male ( $n= 23$  males, 53%;  $n=21$  females, 47%), and consisted predominantly of Coloured individuals ( $n= 26$ , 59%). The sample was predominantly right handed ( $n=42$ , 96%), and the average age of the sample was 37.05 ( $sd= 11.37$ ) years old. A detailed descriptive overview of the four groups with regard to demographic features, and diagnostic-, behavioural- and cognitive assessments is provided in Tables 2, 3, 4 and 5.

Contrary to expectation, the PTSD group showed high levels of social anxiety (LSAS total scores) and 7 out of 11 had were diagnosed with comorbid SAD ( $\mu= 69.36$ ;  $sd =39.47$ ). An overview of the Liebowitz Anxiety Scale (LSAS, Baker, Heinrichs, Kim, & Hofmann, 2002), the Connor-Davidson Resilience Scale (CD-RISC, Connor & Davidson, 2003), the Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998), and the neuropsychological measures (a detailed description of these measures is given in chapter 4) can be found in Tables 3, 4 and 5.

#### 5.2 Primary Aims of the study



### 5.2.1 Cognitive deficits in SAD with and without CHT, and PTSD secondary to CHT

An overview of group findings can be found in Tables 2, 3 and 4.

### 5.2.2 Memory

With regard to the Wechsler Memory Scales (WMS), the SAD+ and the PTSD+ groups scored lowest on the immediate recall trial of the Paired Associative Learning Task (PAL) (WMS\_PAL\_IMM; SAD+,  $\bar{x}=14.90$ ,  $sd=3.87$ ,  $p=$ ; PTSD+,  $\bar{x}=14.86$ ,  $sd=4.40$ ). The HC performed best on this task (WMS\_PAL\_IMM;  $\bar{x}=17.05$ ,  $sd=2.63$ ), followed by the SAD- group ( $\bar{x}=15.53$ ,  $sd=4.49$ ). These results were non-significant,  $F(2,30) = 0.94$ ,  $p=.910$ . A trend of smaller magnitude but in the expected direction was observed on the delayed recall task of the WMS\_PAL scale (WMS\_PAL\_DREC) (SAD+,  $\bar{x}=8.50$ ,  $sd=1.71$ ; SAD-,  $\bar{x}=8.69$ ,  $sd=1.65$ ; PTSD+,  $\bar{x}=8.18$ ,  $sd=1.66$ ; HC,  $\bar{x}=9.4$ ,  $sd=0.84$ ). These results were non-significant,  $F(2,30) = 279$ ,  $p=.758$ .

With regard to the Logical Memory Scales (LM\_O) of the WMS, the HC group performed best on both the immediate recall (WMS\_LM\_IMM,  $\bar{x}=24.50$ ,  $sd=8.30$ ) and the delayed recall trials (WMS\_LM\_DREC,  $\bar{x}=25.00$ ,  $sd=8.36$ ). The PTSD+ group scored similar to the SAD- group on both immediate (WMS\_LM\_O\_IMM: PTSD+,  $\bar{x}=23.54$ ,  $sd=2.29$ ; SAD-,  $\bar{x}=23.61$ ,  $sd=6.04$ ), and delayed recall trials (WMS\_LM\_O\_DREC: PTSD+,  $\bar{x}=20.54$ ,  $sd=3.29$ ; SAD-,  $\bar{x}=21.23$ ,  $sd=7.08$ ).

The lowest scores were obtained by the SAD+ groups on the WMS Logical Memory immediate (WMS\_LM\_O\_IMM:  $\bar{x}=20.20$ ,  $sd=7.50$ ) and delayed trials (WMS\_LM\_O\_DREC:  $\bar{x}=17.40$ ,  $sd=6.07$ ). These results were non-significant (WMS\_LM\_O\_IMM:  $F(2,30) = 1.254$ ,  $p=.300$ ; WMS\_LM\_O\_DREC:  $F(2,30) = 1.338$ ,  $p=.277$ ).

### 5.2.3 Attention

With regard to the Stroop task, lower scores indicate higher interference and are seen as a sign of deficits in selective attention. The lowest interference, or smallest Stroop effect (see STROOP\_C/W in Table 4), was found in the SAD- group ( $\bar{x}=43.69$ ,  $sd=10.88$ ) and HC group ( $\bar{x}=41.90$ ,  $sd=10.84$ ). The HC group showed more interference than the SAD- group. The SAD- group performed better than the traumatized groups (SAD+,  $\bar{x}=39.70$ ,  $sd=12.50$ ; PTSD+,  $\bar{x}=37.36$ ,  $sd=11.74$ ). These results did not reach significance,  $F(2,30) = 1.990$ ,  $p=.154$ .

### 5.2.4 Executive Functioning

However the HC group ( $\bar{x}=15.30$ ,  $sd=7.33$ ) performed better than the SAD+ ( $\bar{x}=18.50$ ,  $sd=16.25$ ) and PTSD+ groups ( $\bar{x}=17.81$ ,  $sd=8.41$ ). The HC made fewer errors on completion of the task compared to the traumatized groups. ANCOVA of WCST scores for the three experimental groups showed no significant group differences  $F(2,30) = 1.516$ ,  $p=.235$ .

## 5.3 Secondary Aims of the study

The average and standard deviations of the CD-RISC (Connor & Davidson, 2003) scores are displayed in Tables 3 and 5.5.3.1.

There was a significant main effect of resilience ( $F(3,40) = 10.666$ ,  $p < .01$ ). The HC reported the highest mean resilience score ( $\bar{x}= 81.70$   $sd= 10.85$ ) of all groups. Mean resilience scores for the SAD+ group ( $\bar{x}= 73.60$ ,  $sd= 14.59$ ) and the PTSD+ group ( $\bar{x}=61.91$ ,  $sd=13.49$ ) were higher than for the SAD- group ( $\bar{x}= 53.00$ ,  $sd= 12.81$ ).

Post hoc analysis showed that the SAD+ group ( $\bar{x}= 73.60$ ,  $sd= 14.59$ ) differed significantly from the SAD- group ( $\bar{x}= 53.00$ ,  $sd= 12.81$ ) with higher resilience ( $p = < .01$ ). The HC ( $\bar{x}= 81.70$   $sd=$

10.85) differed significantly from the SAD- group ( $\bar{x}= 53.00$ ,  $sd= 12.81$ ) with higher resilience ( $p = < .01$ ), while the PTSD+ group ( $\bar{x}=61.91$ ,  $sd=13.49$ ) differed significantly from the HC ( $\bar{x}= 81.70$   $sd= 10.85$ ,  $p < .01$ )

A separate analysis of differences in reported resilience and reported CHT was conducted using independent t-tests (see Table 5 for outcomes). The traumatized group differed significantly from the non-traumatized group (TG,  $\bar{x}=67.47$ ,  $sd= 14.92$ ; NTG  $\bar{x}=53.00$ ,  $sd= 12.81$ ,  $p < .01$ ). The traumatized group was much more resilient than the non-traumatized group,  $t(34) = 2.89$ ,  $p < .01$ ,

The four groups significantly differed from each other with regards to resilience, which raised questions with regards to a possible influence of resilience on the cognitive outcomes. However, linear regression analysis of cognitive scores (dependent) and resilience scores (independent) showed that resilience was not a significant predictor on cognitive performance in this sample ( $p > .05$ ).

### 5.3.2 CHT, cognitive functioning, and resilience

An overview of the demographic variables and results of the group comparisons of both the TG and the NTG can be found in Table 5. Independent t-tests were used to examine for group differences (TG vs. NTG) on all cognitive measures. The analyses showed that groups differed on the STROOP\_W and the WCST Total-error scores. On average, the number of words read by the TG during the STROOP\_W task was lower ( $\bar{x}=91.52$ ,  $sd= 23.31$ ), than the NTG ( $\bar{x}=105.96$ ,  $sd= 14.78$ ). This difference was significant,  $t(34) = 1.95$ ,  $p=.02$ . Furthermore the number of errors made during the WCST was higher in the TG ( $\bar{x}=18.14$ ,  $sd= 7.41$ ) than that in the NTG ( $\bar{x}=13.61$ ,  $sd= 7.12$ ). This difference was significant  $t(34) = 1.75$ ,  $p=.04$ . None significant were the group differences on the Wechsler Memory Scale (WMS) Paired Associative Learning Task (PAL) (immediate,  $t(34) = .44$ ,

$p=.33$ ; and delayed recall,  $t(34) = .61, p=.27$ ) Logical Memory Scales (immediate,  $t(34) = .82, p=.20$ ; and delayed recall,  $t(34) = .105, p=.14$ ).

### 5.3.3 Reported types of CHT in SAD and PTSD

In line with the systematic review conducted for this study (chapter 3), individuals with SAD reported high levels of CHT. The SAD+ group scores were in the moderate to severe range ( $\bar{x}=67.20, sd= 16.84$ ) CHT (scores of 56- 68), with mean scores higher than in the PTSD+ group ( $\bar{x}=55.36, sd= 8.86$ ).

Both the SAD+ and the PTSD+ group had higher mean EA scores (SAD+,  $\bar{x}=18.00, sd= 4.78$ ; PTSD+,  $\bar{x}=13.55, sd= 5.34$ ) and EN scores (SAD+,  $\bar{x}=17.10, sd= 5.50$ ; PTSD+,  $\bar{x}= 15.18, sd= 3.92$ ) than any of the other CHT categories (SA, PA, PN). Mean CTQ-SF sub score was higher in the SAD-group (EA,  $\bar{x}=7.10, sd= 2.51$ ; PA,  $\bar{x}=5.80, sd= 0.98$ ; SA,  $\bar{x}=5.00, sd= 0.00$ ; EN,  $\bar{x}=10.53, sd=2.87$ ; PN,  $\bar{x}=6.1, sd= 1.67$ ), then the HC (EA,  $\bar{x}=6.40, sd= 1.89$ ; PA,  $\bar{x}=6.20, sd= 1.31$ ; SA,  $\bar{x}=5.40, sd= 0.69$ ; EN,  $\bar{x}=8.40, sd=3.27$ ; PN,  $\bar{x}=6.60, sd= 1.95$ ). Of all types of CHT, highest mean scores were found for EA and EN.

Table 2

*Sample characteristics (sample sizes and percentages) of the sample as a whole, the individual groups separately, and traumatized versus non-traumatized groups.*

	All Groups		SAD+		SAD-		PTSD+		HC		TG		NTG	
<i>N=44</i>	<i>N</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
<b>Gender</b>	<b>44</b>		<b>10</b>		<b>13</b>		<b>11</b>		<b>10</b>		<b>21</b>		<b>13</b>	
Male	23	53%	7	70%	7	54%	6	54%	3	30%	13	62%	7	54%
Female	21	47%	3	30%	6	46%	5	45%	7	70%	8	38%	6	46%
<b>Ethnicity</b>	<b>44</b>		<b>10</b>		<b>13</b>		<b>11</b>		<b>10</b>		<b>21</b>		<b>13</b>	
Black	4	10%	2	20%	0	0%	0	0%	2	20%	2	9%	0	0%
White	13	29%	3	30%	2	15%	6	54%	2	20%	9	43%	11	85%
Coloured	26	59%	4	40%	11	85%	5	45%	6	60%	9	43%	2	15%
Asian	1	2%	1	10%	0	0%	0	0%	0	0%	1	5%	0	0%
<b>Handedness</b>	<b>44</b>		<b>10</b>		<b>13</b>		<b>11</b>		<b>10</b>		<b>21</b>		<b>13</b>	
Right	42	96%	10	100%	12	93%	10	91%	10	100%	20	95%	12	92%
Left	1	2%	0	0%	1	7%	0	0%	0	0%	1	5%	1	8%
Ambidextrous	1	2%	0	0%	0	0%	1	9%	0	0%	0	0%	0	0%

*Note.* All groups: results of sample as a whole, SAD+: Social anxiety with CHT, SAD-: Social Anxiety disorder without CHT, PTSD+: Post traumatic stress disorder secondary to CHT, HC: Healthy controls, TG: Traumatized group, NTG: Non traumatized group.

Table 3

*Means and standard deviations of the demographic variables years of education and age and the total and sub scores of psychopathology scores for the total sample, separate groups and traumatized vs. non- traumatized individuals.*

<i>Groups</i>	<i>Total</i>		<i>SAD+ (n=10)</i>		<i>SAD- (n=13)</i>		<i>PTSD+ (n=11)</i>		<i>HC (n=10)</i>		<i>TG (n=21)</i>		<i>NTG (n=13)</i>	
	<i>M</i>	<i>sd</i>	<i>M</i>	<i>sd</i>	<i>M</i>	<i>sd</i>	<i>M</i>	<i>sd</i>	<i>M</i>	<i>sd</i>	<i>M</i>	<i>sd</i>	<i>M</i>	<i>sd</i>
<i>N=44</i>														
<b>Years Of Education</b>	13.30	3.17	13.00	3.43	14.69	2.84	12.00	3.69	13.20	2.35	12.00	3.69	14.69	2.83
<b>Age</b>	37.05	11.37	39.30	11.15	35.54	12.49	40.64	11.03	32.80	10.28	40.00	10.82	35.53	12.48
<b>LSAS_total</b>	66.05	32.96	73.00	15.39	87.53	22.32	69.36	39.47	27.5	13.06	71.09	29.82	87.53	22.32
LSAS_A	31.80	16.67	35.60	8.19	41.69	11.44	34.55	20.02	12.10	6.50	35.04	15.19	41.69	11.44
LSAS_F	34.25	16.85	37.40	8.15	45.84	11.34	34.80	19.79	15.4	9.05	36.04	15.08	45.84	11.34
<b>CTQ_TT</b>	46.86	17.32	67.20	16.84	34.60	4.97	55.36	8.86	33.00	5.75	61.00	14.92	34.69	4.97
CTQ_EA	11.05	6.03	18.00	4.78	7.10	2.51	13.55	5.34	6.40	1.89	15.66	5.45	7.15	2.51
CTQ_PA	7.91	3.96	11.10	6.06	5.80	0.98	9.00	3.41	6.20	1.31	10.00	4.84	5.84	0.98
CTQ_SA	7.30	4.56	9.80	6.90	5.00	0	9.45	4.91	5.40	0.69	9.61	5.79	5.00	0.00
CTQ_EN	12.70	5.12	17.10	5.50	10.53	2.87	15.18	3.92	8.40	3.27	16.09	4.72	10.53	2.87
CTQ_PN	7.91	3.10	11.20	3.39	6.10	1.67	8.18	2.75	6.60	1.95	9.61	3.36	6.15	1.67
<b>CD_RISC_TT</b>	66.43	16.83	73.60	14.59	53.00	12.81	61.91	13.49	81.70	10.85	67.47	14.92	53.00	12.81

*Note.* Total: results of sample as a whole, SAD+: Social anxiety with CHT, SAD-:Social Anxiety disorder without CHT, PTSD+: Post traumatic stress disorder secondary to CHT, HC: Healthy controls, TG: traumatized group, NTG: non-traumatized group, LSAS-Total: Liebowitz Social Anxiety Scale, LSAS-A: Avoidance subscale total score of the Liebowitz Social Anxiety Scale, LSAS-F: Fear subscale total of the Liebowitz Social Anxiety Scale, CTQ-TT: Childhood Trauma Questionnaire total score, CTQ\_EA,-, PA, -SA, -EN, -PN: Childhood Trauma Questionnaire total scores of the subscales Emotional Abuse, Physical Abuse, Sexual Abuse, Emotional Neglect, and Physical Neglect respectively, CD\_RISC\_TT: Connor Davidson Resilience Scale total score.

Table 4

*Means and standard deviations of the cognitive measures and significance values for ANCOVA*

<b>Groups</b>	<i>Total</i>		<i>SAD+</i>		<i>SAD-</i>		<i>PTSD+</i>		<i>HC</i>		<i>ANCOVA*</i>	
	<i>(N=44)</i>		<i>(n=10)</i>		<i>(n= 13)</i>		<i>(n=11)</i>		<i>(n=10)</i>			
<b>Cognitive measures</b>	<i>M</i>	<i>sd</i>	<i>M</i>	<i>sd</i>	<i>M</i>	<i>sd</i>	<i>M</i>	<i>sd</i>	<i>M</i>	<i>sd</i>	<i>F</i>	<i>p</i>
WMS_PAL_IMM	15.56	3.93	14.90	3.87	15.53	4.49	14.86	4.40	17.05	2.63	.094	.910
WMS_PAL_DREC	8.68	1.53	8.50	1.71	8.69	1.65	8.18	1.66	9.40	0.84	.279	.758
WMS_LM_O_IMM	23.02	6.34	20.20	7.50	23.61	6.04	23.54	2.29	24.50	8.30	1.254	.300
WMS_LM_O_DREC	21.04	6.74	17.40	6.07	21.23	7.08	20.54	3.29	25.00	8.36	1.338	.277
STROOP_W	97.02	20.65	93.90	16.77	105.69	14.78	89.36	20.95	97.30	18.94	1.990	.154
STROOP_C	66.84	14.05	66.00	16.77	70.38	13.78	62.81	13.48	67.50	12.96	.811	.454
STROOP_C/W	40.79	11.33	39.70	12.50	43.69	10.88	37.36	11.74	41.90	10.84	.910	.413
WCST Total-errs	16.15	7.42	18.50	6.58	13.61	7.12	17.81	8.41	15.30	7.33	1.516	.235

*Note.* Total: results of sample as a whole, SAD+: Social anxiety with CHT, SAD-: Social Anxiety disorder without CHT, PTSD+: Post traumatic stress disorder secondary to CHT, HC: Healthy Control group, WMS\_PAL\_IMM: Wechsler memory scale word association task immediate recall; WMS\_PAL\_DREC: Wechsler memory scale word association task delayed recall; WMS\_LM\_O\_IMM: Wechsler memory scale Logical Memory direct recall; WMS\_LM\_O\_DREC: Wechsler memory scale Logical Memory Delayed Recall, STROOP\_C: Stroop task Colour word task; STROOP\_W: Stroop word task, STROOP\_W/C: Stroop Task Colour Word task; WCST\_Total\_errs: the total amount of errors made upon completion of the computer administered Wisconsin Card Sorting Test. \*ANCOVA excluded the HC group.

Table 5

Group differences (ANOVA or Kruskal-Wallis test) of traumatized (TG) versus non-traumatized groups (NTG) on cognitive measures

Measures	TG (n=21)		NTG (n=13)		Group comparison	
	M	sd	M	Sd	t	p (1 tailed)
CD_RISC_TT	67.47	14.92	53.00	12.81	2.89	.00**
WMS_PAL_IMM	14.88	4.05	15.53	4.49	.44	.33
WMS_PAL_DREC	8.33	1.65	8.69	1.65	.61	.27
WMS_LM_O_IMM	21.95	5.56	23.61	6.04	.82	.20
WMS_LM_O_DREC	19.04	4.96	21.23	7.08	1.05	.14
STROOP_W	91.52	23.31	105.96	14.78	1.95	.02**
STROOP_C	64.33	14.84	70.38	13.78	1.18	.12
STROOP_C/W	38.47	11.86	43.69	10.88	1.28	.10
WCST Total-errs	18.14	7.41	13.61	7.12	1.75	.04**

*Note.* TG: Groups reporting CHT; NTG: Group reporting no CHT; CD\_RISC\_TT: Connor Davidson Resilience Scale total score, WMS\_PAL\_IMM: Wechsler memory scale word association task immediate recall; WMS\_PAL\_DREC: Wechsler memory scale word association task delayed recall; WMS\_LM\_O\_IMM: Wechsler memory scale Logical Memory direct recall; WMS\_LM\_O\_DREC: Wechsler memory scale Logical Memory Delayed Recall, STROOP\_C: Stroop task Colour word task; STROOP\_W: Stroop word task, STROOP\_W/C: Stroop Task Colour Word task; WCST\_Total\_errs: the total amount of errors made upon completion of the computer administered Wisconsin Card Sorting Test. CTQ-TT:

\* This sample excluded the HC.

\*\*  $p < .05$



## CHAPTER 6

### DISCUSSION AND RECOMMENDATIONS FOR FUTURE RESEARCH

#### 6.1 Cognitive deficits in SAD, and PTSD

The main aim of this study was to assess cognitive performance (memory, attention and EF) in individuals with SAD and PTSD with CHT compared to a group with SAD without CHT and a healthy control group. Since the results of this study are based on a relatively small sample size, the results should be interpreted with caution.

Across all neurocognitive assessments, the traumatized groups (PTSD+ and SAD+) performed less well than the non-traumatized group (SAD-). In most instances, the HC group performed best. This is in line with the literature which has documented greater cognitive deficits in individuals with SAD or PTSD and/ or CHT compared to healthy comparison groups (Asmundson, Stein, Larsen, & Walker, 1994; Bishop, 2007; Bush, Luu, & Posner, 2000; Castaneda et al., 2010; Ferreri, Lapp, & Peretti, 2011; Horner & Hamner, 2002; Jameison & Dinan, 2001; Majer, Nater, Lin, Capuron, & Reeves, 2010).

Additionally, observed memory deficits in the PTSD+ group in this study were greatest on tests of immediate memory. These findings are in line with a recent systematic review which concluded that individuals with PTSD most often show deficits in immediate memory and attention (Horner & Hamner, 2002). With regards to attention, there were deficits across the groups indicating possible attentional biases; however none of the group differences were significant. Results of the Stroop tasks showed that the PTSD+ group had the highest interference of all groups. This finding is supported by (Horner & Hamner, 2002), who found that populations with PTSD show attentional biases. Further analysis showed that this was not associated with CHT since subsequent analysis of the TG vs. NTG groups did not yield significant differences on attention (STROOP C/W).

Another interesting finding was that the SAD- group performed better on the Stroop task than did the HC group. This was unexpected as a substantial body of literature describes attentional biases in SAD samples (Becker, Rinck, Margraf, & Roth, 2001; Buckley, Blanchard, & Neill, 2000; Coles & Heimberg, 2002; Heinrichs & Hofmann, 2001; Mathews & MacLeod, 2005). However, a possible explanation could be that attentional biases in SAD have been measured using emotionally salient stimuli only. This study used the classic Stroop task (chapter 4) which has no emotional component. It may be that individuals with SAD have no attentional deficits based purely on non- emotionally salient cognitive tasks, but that they exhibit attentional biases only when emotions are involved.

Interesting results were obtained for tasks of Executive Functioning (EF). On average, the SAD- group made fewer errors on the WSCT than did the HC group. While group differences were seen between SAD+ and SAD- groups these differences were not statistically significant. It suggests that individuals with SAD do not generally display EF deficits, unless they are presented with emotionally salient stimuli (Goldin, Manber, Hakimi, Canli, & Gross, 2009).

Mean neurocognitive scores were much more pronounced for the SAD+, PTSD+, and HC groups than for the SAD- group. For the SAD- group, there was a trend towards possible memory deficit, but performance was the same or even better compared to all other groups on tasks of attention and EF. This is in line with Sachs et al (2004), who found - as one of the few to conduct SAD research without emotionally salient stimuli- that individuals with SAD, compared to healthy controls, showed significant reductions in event related potentials in task specific regions of the brain. However this was only the case for verbal learning tasks and not for executive functioning tasks (Sachs et al., 2004).

In summary, the results of cognitive assessment show that individuals with SAD alone (SAD-) have few or no cognitive deficits. However, findings for the SAD+ and PTSD+ groups are in the predicted direction

although not statistically significant. As this was a small sample study, further cross-group comparison in a larger sample is warranted.

## 6.2 Resilience, the effects of CHT alone and the CHT subtypes in PTSD and SAD

The secondary aims of this study were to examine resilience levels between the four groups, assess for neuropsychological performance in CHT vs. non-CHT groups, and to compare differences in CHT subtypes between SAD and PTSD. Both disorder groups were found to be less resilient than the healthy comparison group. However, an unexpected finding was that the traumatized clinical groups (SAD+ and PTSD+) reported higher levels of resilience than the non-traumatized SAD group. In addition the TG reported much higher levels of resilience than the NTG. This leads to the conclusion that both the traumatized groups and the disorder groups are more resilient than the healthy controls. To my knowledge, this is the first South African study to find that individuals with psychopathology who have experienced CHT are more resilient than individuals with psychopathology without these experiences.

Similar findings were found in a study by DuMont, Widom and Czaja (2007). The researchers assessed, amongst other variables, documented cases of childhood abuse, neglect and life span resilience in 676 adults. They found the seemingly paradoxical outcome that individuals with more aversive and stressful life events were more resilient (DuMont, Widom and Czaja, 2007).

These outcomes suggest that there may be a 'steeling' effect (Rutter, 2006). Indeed, CHT may lead individuals to grow more resilient, or 'steeling' them, to future stressors in adulthood, even if they develop later psychopathology (Rutter, 2007), suggesting that resilience is more than the counterpart of psychopathology and adversity (Ong, Bergeman, Bisconti & Wallace, 2006).

A further outcome of this study was that individuals with SAD+ and PTSD+ reported moderate to high levels of CHT. In line with a systematic review of the literature on CHT, SAD and PTSD (chapter 3), the highest levels of CHT were reported on the subscales EA and EN. Further analysis however showed that the

SAD+ group reported significantly more EA than the PTSD group. These results are also consistent with a recently published study on SAD in the context of CHT (Kuo, Goldin, Werner, Heimberg & Gross, 2011). The aforementioned study found that EA and EN were reported significantly more by individuals with SAD than any other CHT type (SA, PA, PN), which is in line with the results of this study and the findings of the systematic review reported herein.

### 6.3 Limitations of the study and recommendations for future research

No statistically significant group differences were found on cognitive scores for SAD+, PTSD+, SAD- and HC groups. However, on average, the results indicated a trend in the predicted directions. There is reason to believe that the non-significant results of the group comparisons may result from the small sample sizes and confounding factors in non-treatment seeking individuals (Horner & Hamner, 2002). Furthermore it is likely that non-treatment seeking individuals are better functioning than help seeking individuals. This could potentially confound or distort results and may have been a cause for fewer and less pronounced deficits in the anxiety disorders of interest (Horner & Hamner, 2002).

Furthermore, much of the PTSD literature shows that individuals with PTSD secondary to CHT have significantly more verbal memory deficits compared to healthy populations. On average, cognitive scores were all in the expected directions although the small sample may have resulted in a lack of adequate power to detect cognitive deficits. Since this is an on-going study, repeated analysis with more participants will show if these non-significant data are due to a lack of statistical power.

With regards to resilience, a further exploration of the literature points out that there is still much heterogeneity in outcomes of resilience research (Ruther, 2007). The on-going debate surrounding conceptual issues of resilience such as distinctions between promotive and vulnerability factors, the lack of studies examining gene vs. environment interactions, and research focusing on resilience on outcome variables alone

instead of underlying processes, should be taken into consideration for future recommendations of research and as a limitation of this study (Luthar, Sawyer & Brown, 2006).

With regard to attention, it may be that individuals with SAD have no deficits based on cognition alone. Individuals with SAD might only exhibit attentional biases when emotions are involved. Further research comparing emotionally salient versus non-emotionally salient attentional task performances in SAD populations could shed light on these interesting findings.

With regard to CHT, a significant difference was found in EF. This is in line with research which found that early stress alters PFC development through precocious maturation but a stunted final capacity (Teicher, 1996). However, this is not in line with the finding of Majer et al. (2010), who found no deficits in individuals with CHT. The difference in results could lie in that this study assessed a clinical group with CHT instead of healthy individuals with CHT. Future research is needed to elucidate these differences.

CHT may play a major role in the development of cognitive deficits later in life. Since both PTSD and SAD populations report high levels of CHT, and CHT is shown to have a strong effect on cognitive functioning later in life, this leads to suggest that future research should incorporate assessment of CHT in any investigation of cognitive functioning in both these disorders. Furthermore, it is possible that CHT may enhance resilience to later stressors in adulthood, even in the face of developing psychopathology. Research with a specific focus on resilience in SAD and PTSD in the context of CHT is needed to shed more light on these interesting findings.

Lastly, this study found that EA and EN were reported more by individuals with SAD and PTSD than any other type of CHT (SA, PA, and PN). This concurs with the results of the systematic review (Chapter 3) and gives reason to believe that CHT- such as EA and EN- may impact on the presence and severity of both SAD and PTSD. Interrogating patients with SAD and PTSD about early life exposure to EA and EN is an important component of clinical assessment and should also be incorporated into the management plan of patients with these disorders.



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## APPENDIX A

### A1. Study description for Participants

Dear patient,

The University of Stellenbosch, department of Psychiatry, will be doing a study to examine the effects of early developmental trauma on Social Anxiety Disorder (SAD) and Post Traumatic Stress Disorder (PTSD), as a PhD study by David Rosenstein and a Ma study by Susanne Bakelaar and Carolien Bruijnen.

The purpose of this study is to investigate how early life trauma during childhood development may contribute to and affect individuals, who develop an anxiety condition known as Social Anxiety Disorder (SAD) or Post Traumatic Stress Disorder (PTSD), later in life. Early developmental trauma may consist of a single traumatic childhood experience to on-going childhood abuse or neglect.

The symptoms of SAD are high levels of anxiety and fear in various public situations, performance situations and personal interactions with other people. Examples include: fear of public speaking, using a public restroom, making conversation with a person you have just met and eating in public. The symptoms cause a great deal of distress and interfere with personal, occupational or other daily functioning and activities.

PTSD is characterized with abnormally high levels of anxiety and fear as a response to a life-threatening traumatic experience. Many people experience symptoms after a traumatic experience, however if these symptoms get worse over time or simply don't go away this person may suffer from PTSD. Examples of the symptoms include re-experiencing of the traumatic event, increased arousal and/or avoidance. Examples include: acting or feeling like the event is happening again, nightmares, avoiding places or situations that remind you of the trauma, irritability or anger, difficulty with sleeping.

The study will examine individuals with SAD or PTSD who have had early trauma in their lives and individuals who have SAD without early trauma in their lives as well as healthy volunteers who neither have early trauma nor SAD. We aim to include 75 - 90 participants in total. The study will explore the differences between these individuals in order to find out how early trauma during childhood affects the later development of SAD or PTSD and if early childhood trauma makes SAD or PTSD look different in some individuals. We will also be scanning individuals in a functional Magnetic Resonance Imaging machine (fMRI Machine), to find out how their brains function in SAD and PTSD and what contributions early developmental trauma has specifically on this functioning. With consent, blood will be drawn to examine each individuals DNA, as there are specific genes that have been found to increase peoples' vulnerability towards anxiety and SAD specifically.

This is not a treatment study. Information collected will be for research purposes only and for the completion of the PhD and Msc of the investigators. This information may help others in the future treatment and research of SAD, PTSD and early developmental trauma.

We are looking for individuals with a diagnosis of SAD or PTSD, who are 21 years and older. Participation in the study is voluntary.

If you wish to find out more about this study please contact:

David Rosenstein (Principle Investigator) on:

Cell: 0714485361

Or;

Susanne Bakelaar (Co Investigator) on:

Cell: 0788611109

Email: [sadstudy@yahoo.com](mailto:sadstudy@yahoo.com)



## A2. Study description for Colleagues/Clinics/Health Professionals

Dear Colleague

The Faculty of Health Sciences at the University of Stellenbosch, department of Psychiatry, will be doing a research study to examine the effects of early developmental trauma on social anxiety disorder. The research study is part of David Rosenstein's doctoral dissertation. The study has been approved by the Health Research Ethics Committee of the Faculty of Health Sciences, University of Stellenbosch and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

The purpose of this study is to investigate how trauma during childhood development may contribute to and affect individuals, who develop an anxiety conditions known as Social Anxiety Disorder (SAD) and Post traumatic Stress Disorder (PTSD), later in life. It will examine individuals with SAD and PTSD who have had early trauma in their lives and individuals who have SAD without early trauma in their lives as well as healthy volunteers who neither have early trauma nor SAD. We aim to include 75-90 participants in total. The study will explore the differences of these individuals in order to find out how early trauma during childhood affects the later development of SAD or PTSD. We will also be scanning individuals in a functional Magnetic Resonance Imaging machine (fMRI Machine), to find out how their brains function in SAD and PTSD and what contributions early developmental trauma has specifically on this functioning. With consent, blood will also be drawn to examine each individuals DNA, as there are specific genes that have been found to increase peoples' vulnerability towards anxiety and SAD specifically.

This is not a treatment study. Information collected will be for research purposes only and for the completion of the PhD and Msc dissertations. This information may help others in the future treatment and research of SAD, PTSD and early developmental trauma.

We are looking for individuals with a diagnosis of SAD or PTSD, who are 21 years and older. Participation in the study is voluntary.

Please let us know if you have any SAD or PTSD patients in your care that might be interested in participating. Thank you for your interest.

You may contact:

0714485361 (David) or 0788611109 (Susanne)

E-mail: [sadstudy@yahoo.com](mailto:sadstudy@yahoo.com)

A3. Study Advertisement

**Do you feel anxious in social situations?  
AND/OR  
Have you experienced psychological trauma  
as an adult OR child?**

**you may be eligible to participate in a study  
conducted by Stellenbosch University**

**for more information contact us on:**

**Tel: 07 14 48 53 61**

**E-mail: [sadstudy@yahoo.com](mailto:sadstudy@yahoo.com)**

**Website: [www.socialanxiety.co.za](http://www.socialanxiety.co.za)**



#### A4. E-mail to health professionals

Subject line:

Volunteers required for non- treatment fMRI study

E-mail:

Dear clinician,

Your details have been forwarded to us by Derine Louw at the Mental Health Information Centre (MHIC). We are writing about a non-treatment study entitled “Neurobiological mechanisms of social anxiety disorder in the context of early developmental trauma: an fMRI study”. The study will be conducted through the Stellenbosch University, Faculty of Health Sciences, Department of Psychiatry. The investigators are David Rosenstein, Susanne Bakelaar and Carolien Bruijnen.

We are at the initial stages of researching the influence and contribution of early developmental trauma (EDT) on the later development of Social Anxiety Disorder (SAD) and/or Post Traumatic Stress Disorder (PTSD). We are currently looking for participants to volunteer. The research will contribute significantly to our current clinical understandings of EDT, SAD and PTSD.

The requirements we have for participation include;

- Post Traumatic Stress Disorder secondary to childhood trauma, or
- Social Anxiety Disorder with or without childhood traumatic experiences  
(not both PTSD and SAD)
- No History of head injury
- No other significant comorbid psychopathology
- Not currently pregnant
- Over the age of 21

The study consists of 2/3 visits of up to 2 hours. All volunteers will be reimbursed for travel expenses. Please find attached 2 documents; detailing the research protocol for clinicians and volunteers. One document is addressed to you, the clinician; the other is addressed to the patient.

If you have any questions or need further information, don't hesitate to contact us at: [sadstudy@yahoo.com](mailto:sadstudy@yahoo.com)

Or call David Rosenstein on: 083 923 2585

Or Susanne Bakelaar on: 078 861 109

## APPENDIX B

### B1. Pre-Screening Telephone Interview

Good Day \_\_\_\_\_ my name is \_\_\_\_\_. I am phoning you about the study entitled 'neurobiological mechanisms of social anxiety disorder in the context of early developmental trauma: a functional magnetic resonance imaging (fMRI) study'. We heard that you are interested in participating in our study. Please note that participation is voluntary. Before we meet may I take some time to ask you some questions now over the telephone, to see if you qualify to participate?

Everything that I ask you now is confidential and will help us decide whether you are suitable to participate in our study. Thank you for taking some time to talk with me over the phone.

Please may you confirm your:

Name:

Address:

Contact Number(s):

Date of Birth:

Gender:

Ethnicity:

Language(s; spoken at home, 1<sup>st</sup>, 2<sup>nd</sup> etc):

Handedness:

Education:

Have you been diagnosed with social anxiety disorder or social phobia? YES / NO

Have you ever been diagnosed with another psychological or psychiatric illness or condition? YES / NO

If YES what? \_\_\_\_\_

Are you currently on any medication? YES / NO

If YES what? \_\_\_\_\_

Are you currently on any psychiatric medication? YES / NO

If YES what? \_\_\_\_\_

Have you had a head injury or been in an injury where you lost consciousness? YES / NO

If YES, please describe what happened:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Do you have a pacemaker or any metal implants? YES / NO

If YES what? \_\_\_\_\_

Are you currently pregnant? YES / NO

B2. Demographic Questionnaire

Full Name: \_\_\_\_\_ Telephone Numbers:  
 Address: \_\_\_\_\_ Home: \_\_\_\_\_  
 \_\_\_\_\_ Work: \_\_\_\_\_  
 \_\_\_\_\_ Cell: \_\_\_\_\_

Gender:  Male  Female      Date of Birth (DOB)       Age:

**Ethnicity / Race**

African / Black  1  
 Asian  2  
 Caucasian / White  3  
 Colored  4  
 Other  5  
 Please Specify: \_\_\_\_\_

**Marital Status**

Single  1  
 Married  2  
 With a partner  3  
 Separated  4  
 Divorced  5  
 Widowed  6

**Religion**

MG Kerk  1  
 Catholic  2  
 Hindu  3  
 Jewish  4  
 Muslim  5

**Living Arrangements**

Living alone  1  
 Living with family  2  
 Living with friends  3  
 Living with spouse / partner  4

Protestant  6

No religion  7

Other  8

Please Specify: \_\_\_\_\_

Are you actively religious?  Y /  N

**Household income per year**

Less than R10 000  1

R10 000 to R20 000  2

R20 000 to R40 000  3

R40 000 to R60 000  4

R60 000 to R100 000  5

More than R100 000  6

Please Specify: \_\_\_\_\_

**Handedness**

Right handed

Left handed

Both

**Highest level of education**

Primary School (Grade):  1  2  3  4  5  6  7

High School (Grade):  8  9  10  11  12

College / University: No. years:

Specify Degree: \_\_\_\_\_

Diploma: No. years:

Specify Diploma: \_\_\_\_\_

**Employment**

Employed:  Y /  N

Job Title / Description: \_\_\_\_\_

Time starting work:

Time spent at job:

Breadwinner:  Y /  N

Medical History:

Have you been diagnosed with a medical condition / problem?  Y /  N

If Yes, what?

Medication:

Are you currently taking any medication?  Y /  N

If Yes, what?

Have you been on any medication in the past?  Y /  N

If Yes, what?

Psychiatric History:

Have you ever been diagnosed with a psychiatric problem or illness?  Y /  N

If Yes, what?

Have you ever had counselling or psychotherapy?  Y /  N

If Yes, what for?

For how long?



Psychiatric Medication:

Are you currently on any psychiatric medication?  Y /  N

If Yes, what medication?

What for?

For how long have you taken?

Have you taken psychiatric medication in the past?  Y /  N

Brief Trauma History

Have you ever experienced a traumatic event in childhood or adulthood?  Y /  N

If Yes, please could you briefly elaborate?

Ages at which trauma occurred?

B3. Informed Consent

## **PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM**

**TITLE OF THE RESEARCH PROJECT:**

NEUROBIOLOGICAL MECHANISMS IN SOCIAL ANXIETY DISORDER IN THE CONTEXT OF EARLY DEVELOPMENTAL TRAUMA: AN FMRI STUDY

**PRINCIPAL INVESTIGATOR:**

DAVID ROSENSTEIN

**CO INVESTIGATOR:**

SUSANNE BAKELAAR

**ADDRESS:**

**Department of Psychiatry, Faculty of Health Sciences, Clinical Building, 5<sup>th</sup> Floor**

**CONTACT NUMBERS:**

DAVID ROSENSTEIN: 071 448 5361

SUSANNE BAKELAAR: 0788611109

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the study staff or doctor any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is **entirely voluntary** and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part.

This study has been approved by the **Health Research Ethics Committee of the Faculty of Health Sciences, University of Stellenbosch** and will be conducted according to the ethical guidelines and principles of the

international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

### **What is this research study all about?**

This research project is aimed at learning more about Social Anxiety Disorder and Early Developmental Trauma. This research is part of David Rosenstein's doctoral dissertation, at the Faculty of Health Sciences at the University of Stellenbosch, Susanne Bakelaar's Masters dissertation, at the Faculty of Arts and Social Sciences at the University of Stellenbosch, and Carolien Bruijnen's Masters dissertation, at the Faculty of Psychology and Neuroscience at Maastricht University, in the Netherlands.

The purpose of this study is to investigate how early life trauma during childhood development may contribute to and affect individuals, who develop an anxiety condition known as Social Anxiety Disorder (SAD), later in life, or a condition known as Post Traumatic Stress Disorder (PTSD). It will examine individuals with SAD who have had early trauma in their lives, individuals who have SAD without early trauma in their lives, and individuals that have had early trauma in their lives and developed PTSD, as well as healthy volunteers who neither have had early trauma, SAD nor PTSD. We aim to include 60-80 participants in total. The study will explore the differences of these individual's in order to find out how early trauma during childhood affects the later development of SAD or PTSD, and if early childhood trauma makes SAD look different in some individuals. You will also have a type of brain scan, called a fMRI (functional magnetic resonance imaging) scan. This is a machine used to look at brain activity by creating magnetic fields. By magnetically scanning the head from all sides a picture of your brain activity can be formed. This picture will then be used to find out how the brain functions in SAD and PTSD, and what contributions early life trauma can have on brain functioning. The scan will require you to lie on your back on a table that will move into the scanning machine for the time it will take for the scan. During this time you will be able to close your eyes and rest.

This is not a treatment study. Information collected will be for research purposes only and for the completion of the PhD and Masters degrees. The collected information may help others in the future treatment and research of SAD and early developmental trauma.

If you decide to participate, we shall ask you to attend a series of three study assessment sessions. You will be compensated for your travel expenses.

The first assessment session will comprise an interview with a researcher. In this interview you will be asked a series of questions about yourself, if you have had any previous medical or mental health problems, and to see if you will be able to be scanned in the fMRI machine. You will then be interviewed to find out what psychological difficulties or problems you might have, using questionnaires. You will also be given seven questionnaires that you are asked to complete yourself. You will have the assistance of a researcher available to help you, should you feel stuck answering the questions. Depending on the category you will be placed in (SAD or PTSD), the first questionnaire you are asked to fill out is either a self report questionnaire about how much social anxiety you have, or a clinician administered questionnaire about how traumatized you are. After this, the second and third questionnaire will ask you about your past and any trauma that you may have suffered as a child and/or when growing up, the fourth questionnaire will ask you about your personality, the fifth questionnaire will address your quality of life, the sixth will ask about your social phobia in relation to ethnicity, and the seventh and final questionnaire will ask you about how resilient you are in stressful situations. This entire session will last approximately 2 hours. You will be given a 15-minute break in between for you to rest.

The second assessment session will include a series of neuropsychological assessments. The neuropsychological assessments are a series of tests and questionnaires that will examine your memory, verbal skill, visual spatial ability, planning and reasoning ability, and lastly your level of concentration and attention. This will take between 3 to 4 hours to complete. You will be doing this part of the assessment with a researcher who will be guiding you through the neuropsychological assessments and help you, should you have any difficulty.

The third and last assessment session will involve fMRI scanning. Before you are placed within the fMRI machine you will be asked to complete a questionnaire, which will assess your current level of anxiety. You will then enter the fMRI machine. In the machine you will be asked to lie very still. Whilst you are in the scanner you will be asked to complete two tasks. In the first task you will be shown a series of pictures of people's faces, showing different emotions. You will then be asked to identify the emotion in each face, while the machine scans you. In the second task you will be asked to press a button at a "go" sign and to not press the button when a "no go" sign is shown. This entire procedure will take approximately 1½ hours.

**Why have you been invited to participate?**

We have invited you to participate in this study because you may have the criteria we are looking for in individuals that will help us to investigate early developmental trauma, post traumatic stress and social anxiety.

**Will you benefit from taking part in this research?**

There are no direct benefits to you for participating in this study. However, this study may help scientists understand SAD, PTSD, and early developmental trauma much better. It may also help in the future treatment and prevention of SAD, PTSD and early developmental trauma.

**Are there risks involved in your taking part in this research?**

If you feel fatigued, uncomfortable, or in any way upset during any part of the session(s), you may ask to stop for a rest break or have the interview or scanning discontinued. The research interview does not take the place of a full psychiatric evaluation. You may experience some emotional discomfort when answering some questions. If any particular question makes you feel uncomfortable, you may discuss its importance with the specially trained interviewer or scientist. You may choose not to answer any question which you are still uncomfortable with.

You may feel some discomfort or fatigue associated with being in the fMRI scanner or while undergoing neuropsychological testing. There will always be an assistant available to answer questions and guide you.

**Who will have access to your medical/research information and records?**

Personal information that may be used to identify you (such as your name, contact information, etc.) will not be made public. Your information will be stored in the Department of Psychiatry at the University of Stellenbosch for data analysis and further research analysis for this study. All the information you provide will be kept strictly confidential and will only be used by the study staff working on this study.

The results of this study will be used in the final doctoral dissertation of David Rosenstein, and the final master's dissertations of Susanne Bakelaar and Carolien Bruijnen. They may also be used to generate research findings for publication, so that other scientists and clinical practitioners in mental health may benefit from the research findings. Other mental health care practitioners may benefit from the findings in this study to help them treat SAD or PTSD and in the prevention of early childhood developmental trauma.

**Will you be paid to take part in this study and are there any costs involved?**

No, you will not be paid to take part in the study but your transport and meal costs will be covered for each study visit. There will be no costs involved for you, if you decide to take part.

**Is there anything else that you should know or do?**

- You should inform your family practitioner or usual doctor that you are taking part in a research study.
- You should also inform your medical insurance company that you are participating in a research study.
- You can contact David Rosenstein at tel. 071 448 5361, or Susanne Bakelaar at tel. 078-861-1109 if you have any further queries or encounter any problems.
- You can contact the Committee for Human Research at 021-938-9207 if you have any concerns or complaints that have not been adequately addressed by your study scientist.
- You will receive a copy of this information and consent form for your own records.

Declaration by participant

By signing below, I ..... agree to take part in a research study entitled **NEUROBIOLOGICAL MECHANISMS IN SOCIAL ANXIETY DISORDER IN THE CONTEXT OF EARLY DEVELOPMENTAL TRAUMA: AN FMRI STUDY.**

I declare that:

- I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be penalised or prejudiced in any way.
- I may be asked to leave the study before it has finished, if the study doctor or researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.

Signed at (*place*) ..... on (*date*) ..... 2010.

.....  
**Signature of participant**

.....  
**Signature of witness**

Declaration by investigator

I (*name*) ..... declare that:

- I explained the information in this document to .....
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above
- I did/did not use a interpreter. (*If a interpreter is used then the interpreter must sign the declaration below.*)

Signed at (*place*) ..... on (*date*) ..... 2010.

.....  
**Signature of investigator**

.....  
**Signature of witness**

**Declaration by interpreter**

I (*name*) ..... declare that:

- I assisted the investigator (*name*) ..... to explain the information in this document to (*name of participant*) ..... using the language medium of Afrikaans/Xhosa.
- We encouraged him/her to ask questions and took adequate time to answer them.
- I conveyed a factually correct version of what was related to me.
- I am satisfied that the participant fully understands the content of this informed consent document and has had all his/her question satisfactorily answered.

Signed at (*place*) ..... on (*date*) ..... 2010.

.....  
**Signature of interpreter**

.....  
**Signature of witness**

## **APPENDIX C**

### **C1. MINI**

This questionnaire is not attached in the appendixes because of copyright restrictions. Please contact the author or publisher for a copy of the questionnaire.



## C2. CAPS

This questionnaire is not attached in the appendixes because of copyright restrictions. Please contact the author or publisher for a copy of the questionnaire.

### C3. LSAS

This questionnaire is not attached in the appendixes because of copyright restrictions. Please contact the author or publisher for a copy of the questionnaire.

## **APPENDIX D**

### **D1. CTQ-SF**

This questionnaire is not attached in the appendixes because of copyright restrictions. Please contact the author or publisher for a copy of the questionnaire.

## D2. CD-RISC

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## APPENDIX E

### E1. Neuropsychological Testing Protocol

## **NEUROPSYCHOLOGICAL TESTING PROCEDURES**

To begin the Neuropsychological battery: **“We are going to do a group of neuropsychological tests, which are designed to measure the functioning of the brain and nervous system. The tests involve answering questions and doing things with your hands. There will be tests of memory, problem solving, concentration, language, motor skills and academic achievement. Some of these tests are easy and they are designed so that everyone can do well on them. Other tests, however, are designed so that there will be a point on the test at which you can no longer do well. You won’t do well on all the tests – no one does!”**

**“This evaluation will take approximately 1 hour. You may also tell me if at anytime you feel a need to take a break.”**

### **WECHSLER MEMORY SCALE: ASSOCIATE LEARNING**

**Trial 1: “I am going to read you a list of words, two at a time. Listen carefully, because after I am finished I shall want you to remember the words that go together. For example, if the words were ‘east-west; gold-silver’, then when I would say the word ‘east’, I would expect you to answer (pause) ‘west’. And when I say the word ‘gold’, you would of course answer (pause) ‘silver’. Do you understand? Now listen carefully to the list as I read it.”**

Read one pair every 2 seconds.

**Trial 2: “Now I am going to read the same list of words, two at a time. Listen carefully, because after I am finished I shall want you to remember the words that go together. Do you understand? Now listen carefully to the list as I read it.”**

**Trial 3:** “Now I am going to read the same list of words, two at a time, for the last time. Listen carefully, because after I am finished I shall want you to remember the words that go together. Do you understand? Now listen carefully to the list as I read it.”

After the end of trial 3, record the clock time on the scoring form. Delayed recall should be done 20-30 minutes after this time

### **WECHSLER MEMORY SCALE: ASSOCIATE LEARNING**

**20 minute Delayed Recall:** “Remember the pairs of words I read to you earlier? I want to see how many pairs you still remember.”

### **WECHSLER MEMORY SCALE: LOGICAL MEMORY**

**Trial A:** “I am going to read you a little selection of about 4 or 5 lines. Listen carefully, because when I am through I want you to tell me everything I read to you. Are you ready?” (Start reading story A from the scoring form.) “Now what did I read to you? Tell me everything. Begin at the beginning.”

**Trial B:** “Now I am going to read you another little selection and see how much more you can remember on this. Listen carefully.” (Start reading story B from the scoring form.) “Now what did I read to you? Tell me everything. Begin at the beginning.”

After the end of trial B, record the clock time on the scoring form. Delayed recall should be done 20-30 minutes after this time

### **WECHSLER MEMORY SCALE: LOGICAL MEMORY**

20 minute Delayed Recall: **“Do you remember the stories I told you earlier? I would like to see how much you can remember of these stories. Let’s start with the first story, tell me everything. Begin at the beginning.”**

After the participant has made clear that he doesn’t remember anything else, say:

**“Now the other story. Tell me everything and begin at the beginning.”**

## **STROOP TASK**

Words: Place Word card in front of participant.

**“This is a test of how fast you can read the words on this page. After I say ‘Begin’, you are to read down the columns starting with the first one (point to leftmost column) until you complete it (run hand down left most column) and then continue without stopping down the remaining columns in order (run your hand down the second column, then third, fourth, and fifth columns). If you finish all of the columns before I say ‘Stop’, then return to the first column and begin again (point to the first column). Remember, do not stop reading until I say ‘Stop’ and read out loud as quickly as you can. If you make a mistake, I will say ‘No’ to you. Correct your error and continue without stopping. Are there any questions?”**

**“Ready?... Then begin.”** After 45 seconds, say **“Stop.”**

Colors: Place Color card in front of participant.

**“This is a test of how fast you can name the colors on this page. You will complete this page just as you did the previous page, starting with this first column. Remember to name the colors out loud as quickly as you can. Are there any questions?”**

**“Ready?... Then begin.”** After 45 seconds, say **“Stop.”**

Colors-Words: Place the Color-Word page in front of participant.

**“This page is like the page you just finished. I want you to name the color of ink the words are printed in, ignoring the word that is printed in each item. For example, (point to the first item of the first column), this is the first item: what would you say?”**

If the subject is correct, go on with instructions. If incorrect, say:

**“No that is the word that is spelled there. I want you to say the color of the ink the word is printed in. Now (point to the same item), what would you say to this item? That’s correct (point to the second item), what would the response be to this item?”**

If correct, proceed; if incorrect, repeat above as many times as necessary until the subject understands or it becomes clear that it is impossible to go on.

**“Good. You will do this page just like the others, starting with the first column (pointing) and then going on to as many columns as you can. Remember, if you make a mistake, just correct it and go on. Are there any questions?”**

**“Ready?... Then begin.”** After 45 seconds, say **“Stop.”**

Trial 2: After participant has indicated that they can recall no more words, say: **“Now we are going to try it again. I am going to read the same list of words to you. Listen carefully and tell me as many of the words as you can remember, in any order including the words you told me the first time.”** Read list at rate of one word every two seconds.

Trial 3: After participant has indicated that they can recall no more words, say: **“I am going to read the list one more time. As before, I’d like you to tell me as many of the words as you can remember, in any order, including the words you’ve already told me.”**

After participant has indicated that they can recall no more words record the clock time on the Time Trial 3 Completed line. Delay should be done 20-30 minutes after this time.



**WISCONSIN CARD SORTING TEST**

**“This test is a little unusual, because I am not allowed to tell you very much about how to do it. You will be asked to match each of the cards that appear here (point to the first response card at the bottom center of the screen) to one of these four key cards (point to each of the stimulus cards at the top of the screen). On the keyboard in front of you are four symbols which resemble the key cards (point to each of the keyboard keys on which the appropriately positioned Keytop is affixed). To make a match, simply press the key with the key card symbol that you believe matches the card at the bottom of the screen (point to the first response card at the bottom center of the screen). The computer will place your card under the key card on the screen that you select, and a new card will appear at the bottom of the screen. I cannot tell you how to match the cards, but the computer screen will display a word that will tell you each time whether you are right or wrong. The computer will also say the word it displays on the screen. If you are wrong, simply try to match the next card correctly, and then continue matching the cards correctly until the test is over. There is no time limit on this test. Are you ready? Let’s begin.”**

No other assistance should be given. If they are confused, you may tell the participant, **“There is a way of matching the cards, but you have to figure it out.”**

## E2. Wechsler Memory Scale: Associate Learning; immediate recall

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### E3. Wechsler Memory Scale: Logical Memory; immediate recall

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#### E4. Wechsler Memory Scale: Associate Learning; delayed recall

This Assessment is not attached in the appendixes because of copyright restrictions. Please contact the author or publisher for a copy of the assessment form.

### E5. Wechsler Memory Scale: Logical Memory; delayed recall

This Assessment is not attached in the appendixes because of copyright restrictions. Please contact the author or publisher for a copy of the assessment form.

## E6. Stroop task

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**APPENDIX C**

C1. MINI

**M.I.N.I.**

**MINI INTERNATIONAL NEUROPSYCHIATRIC  
INTERVIEW**

**English Version 6.0.0**

**DSM-IV**

**USA: D. Sheehan<sup>1</sup>, J. Janavs, K. Harnett-Sheehan, M.  
Sheehan, C. Gray.**

<sup>1</sup>University of South Florida College of Medicine, Tampa, USA

**EU: Y. Lecrubier<sup>2</sup>, E. Weiller, T. Hergueta, C. Allgulander, N. Kadri, D.  
Baldwin, J. P. Lépine.**

<sup>2</sup>Hôpital de la Salpêtrière – Paris, France

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& Lecrubier Y

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#### **DISCLAIMER**

Our aim is to assist in the assessment and tracking of patients with greater efficiency and accuracy. Before action is taken on any data collected and processed by this program, it should be reviewed and interpreted by a licensed clinician.

This program is not designed or intended to be used in the place of a full medical and psychiatric evaluation by a qualified licensed physician – psychiatrist. It is intended only as a tool to facilitate accurate data collection and processing of symptoms elicited by trained personnel.



**M.I.N.I. 6.0.0**  
**(January 1,**  
**2008)**

<i>Patient Name:</i>	<i>Patient Number:</i>
<i>Date of Birth:</i>	<i>Time Interview Began:</i>
<i>Interviewer's Name:</i>	<i>Time Interview Ended:</i>
<i>Date of Interview:</i>	<i>Total Time:</i>

A	MAJOR DEPRESSIVE EPISODE	Current (2 weeks) Recurrent  Past	296.20-296.26 Single 296.30-296.36 Recurrent 296.20-296.26 Single	F32.x F33.x F32.x
B	SUICIDALITY	Current (Past Month)  Low   Moderate   High		
C	MANIC EPISODE	Current Past	296.00-296.06	F30.x-F31.9
	HYPOMANIC EPISODE	Current Past	296.80-296.89	F31.8-F31.9/F34.0
	BIPOLAR I DISORDER	Current Past	296.0x-296.6x 296.0x-296.6x	F30.x-F31.9 F30.x-F31.9
	BIPOLAR II DISORDER	Current Past	296.89 296.89	F31.8 F31.8
	BIPOLAR DISORDER NOS	Current Past	296.80 296.80	F31.9 F31.9
D	PANIC DISORDER	Current (Past Month)  Lifetime	300.01/300.21	F40.01-F41.0
E	AGORAPHOBIA	Current	300.22	F40.00
F	SOCIAL PHOBIA (Social Anxiety Disorder)	Current (Past Month) Generalized  Non_Generalized	300.23 300.23	F40.1 F40.1
G	OBSESSIVE-COMPULSIVE DISORDER	Current (Past Month)	300.3	F42.8
H	POSTTRAUMATIC STRESS DISORDER	Current (Past Month)	309.81	F43.1
I	ALCOHOL DEPENDENCE	Past 12 Months	303.9	F10.2x
	ALCOHOL ABUSE	Past 12 Months	305.00	F10.1
J	SUBSTANCE DEPENDENCE (Non-alcohol)	Past 12 Months	304.00-90/305.20-90	F11.1-F19.1

MODULES	TIME FRAME	MEETS CRITERIA	DSM-IV-TR	ICD-10	PRIMARY DIAGNOSIS
SUBSTANCE ABUSE (Non_alcohol)	Past 12 Months		304.00-.90/305.20-.90	F11.1-F19.1	
<b>K PSYCHOTIC DISORDERS</b>	<b>Lifetime</b>				
			295.10-295.90/297.1/ Current 297.3/293.81/293.82/ 293.89/298.8/298.9	F20.xx-F29	
MOOD DISORDER WITH PSYCHOTIC FEATURES	Lifetime	†	296.24/296.34/296.44	F32.3/F33.3/	
	Current	†	296.24/296.34/296.44	F30.2/F31.2/F31.5 F31.8/F31.9/F39	
<b>L ANOREXIA NERVOSA</b>	<b>Current (Past 3 Months)</b>	†	307.1	F50.0	
<b>M BULIMIA NERVOSA</b>	<b>Current (Past 3 Months)</b>	†			
			307.51	F50.2	
	<b>Current</b>	†	307.1	F50.0	
ANOREXIA NERVOSA, BINGE EATING/PURGING TYPE					
<b>N GENERALIZED ANXIETY DISORDER</b>	<b>Current (Past 6 Months)</b>	†	300.02	F41.1	
<b>O MEDICAL, ORGANIC, DRUG CAUSE PRESENT</b>		†			
<b>P ANTISOCIAL PERSONALITY DISORDER</b>	<b>Lifetime</b>	†	301.7	F60.2	

IDENTIFY THE PRIMARY DIAGNOSIS BY CHECKING THE APPROPRIATE CHECK BOX.

(Which problem troubles you the most or dominates the others or came first in the natural history?)

The translation from DSM-IV-TR to ICD-10 coding is not always exact. For more information on this topic see Schulte-Markwort. Crosswalks ICD-10/DSM-IV-TR. Hogrefe & Huber Publishers 2006.

## GENERAL INSTRUCTIONS

The M.I.N.I. was designed as a brief structured interview for the major Axis I psychiatric disorders in DSM-IV and ICD-10. Validation and reliability studies have been done comparing the M.I.N.I. to the SCID-P for DSM-III-R and the CIDI (a structured interview developed by the World Health Organization). The results of these studies show that the M.I.N.I. has similar reliability and validity properties, but can be administered in a much shorter period of time (mean  $18.7 \pm 11.6$  minutes, median 15 minutes) than the above referenced instruments. It can be used by clinicians, after a brief training session. Lay interviewers require more extensive training.**INTERVIEW:**

In order to keep the interview as brief as possible, inform the patient that you will conduct a clinical interview that is more structured than usual, with very precise questions about psychological problems which require a yes or no answer.**GENERAL FORMAT:**

The M.I.N.I. is divided into **modules** identified by letters, each corresponding to a diagnostic category.

- At the beginning of each diagnostic module (except for psychotic disorders module), screening question(s) corresponding to the main criteria of the disorder are presented in a **gray box**.

- At the end of each module, diagnostic box(es) permit the clinician to indicate whether diagnostic criteria are met.**CONVENTIONS:**

*Sentences written in « normal font »* should be read exactly as written to the patient in order to standardize the assessment of diagnostic criteria.

*Sentences written in « CAPITALS »* should not be read to the patient. They are instructions for the interviewer to assist in the scoring of the diagnostic algorithms.

*Sentences written in « bold »* indicate the time frame being investigated. The interviewer should read them as often as necessary. Only symptoms occurring during the time frame indicated should be considered in scoring the responses.

*Answers with an arrow above them ( )* indicate that one of the criteria necessary for the diagnosis(es) is not met. In this case, the interviewer should go to the end of the module, circle « **NO** » in all the diagnostic boxes and move to the next module.

When terms are separated by a *slash (/)* the interviewer should read only those symptoms known to be present in the patient (for example, question H6).

*Phrases in (parentheses)* are clinical examples of the symptom. These may be read to the patient to clarify the question.**RATING INSTRUCTIONS:**

All questions must be rated. The rating is done at the right of each question by circling either Yes or No. Clinical judgment by the rater should be used in coding the responses. Interviewers need to be sensitive to the diversity of cultural beliefs in their administration of questions and rating of responses. The rater should ask for examples when necessary, to ensure accurate coding. The patient should be encouraged to ask for clarification on any question that is not absolutely clear.

The clinician should be sure that each dimension of the question is taken into account by the patient (for example, time frame, frequency, severity, and/or alternatives).

Symptoms better accounted for by an organic cause or by the use of alcohol or drugs should not be coded positive in the

M.I.N.I. The M.I.N.I. Plus has questions that investigate these issues.

For any questions, suggestions, need for a training session or information about updates of the M.I.N.I., please contact: David V Sheehan, M.D., M.B.A. Yves Lecrubier, M.D. / Thierry Hergueta, M.S. University of South Florida College of Medicine INSERM U302, Hôpital de la Salpêtrière

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## A. MAJOR DEPRESSIVE EPISODE

(· MEANS : GO TO THE DIAGNOSTIC BOXES, CIRCLE NO IN ALL DIAGNOSTIC BOXES, AND MOVE TO THE NEXT MODULE)

A1	a	Were you <u>ever</u> depressed or down, most of the day, nearly every day, for two weeks? IF NO, CODE NO TO <b>A1b</b> : IF YES ASK:	NO	YES
	b	<u>For the past two weeks</u> , were you depressed or down, most of the day, nearly every day?	NO	YES
A2	a	Were you <u>ever</u> much less interested in most things or much less able to enjoy the things you used to enjoy most of the time, for two weeks?	NO	YES
		IF NO, CODE NO TO <b>A2b</b> : IF YES ASK:		
	b	In the <u>past two weeks</u> , were you much less interested in most things or much less able to enjoy the things you used to enjoy most of the time?	NO	YES
		IS <b>A1a</b> OR <b>A2a</b> CODED YES?	NO	YES

A3 IF **A1b** OR **A2b** = **YES**: EXPLORE THE **CURRENT** AND THE MOST SYMPTOMATIC **PAST** EPISODE, OTHERWISE IF **A1b** AND **A2b** = **NO**: EXPLORE ONLY THE MOST SYMPTOMATIC **PAST** EPISODE

**Over that two week period, when you felt depressed or uninterested:**

### Past 2 Weeks Past Episode

a Was your appetite decreased or increased nearly every day? Did your NO YES NO YES

weight decrease or increase without trying intentionally (i.e., by  $\pm 5\%$  of body weight or  $\pm 8$  lbs. or  $\pm 3.5$  kgs., for a 160 lb./70 kg. person in a month)? IF YES TO EITHER, CODE YES.

b Did you have trouble sleeping nearly every night NO YES NO YES (difficulty falling asleep, waking up in the middle of the night,

early morning waking or sleeping excessively)?

c Did you talk or move more slowly than normal or were you fidgety, NO YES NO YES

restless or having trouble sitting still almost every day?

d Did you feel tired or without energy almost every day? NO YES NO YES

e Did you feel worthless or guilty almost every day? NO YES NO YES

IF YES, ASK FOR EXAMPLES.

THE EXAMPLES ARE CONSISTENT WITH A DELUSIONAL IDEA. Current Episode S No S Yes

P  
a  
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N  
o  
S  
  
Y  
e  
s

f Did you have difficulty concentrating or making decisions almost every day? NO YES NO YES

g Did you repeatedly consider hurting yourself, feel suicidal, NO YES NO YES

or wish that you were dead? Did you attempt suicide or plan a suicide?

IF YES TO EITHER, CODE YES.

A4 Did these symptoms cause significant problems at home, at work, socially, NO YES NO YES

at school or in some other important way?

A5 In between 2 episodes of depression, did you ever have an interval

of at least 2 months, without any significant depression or any significant loss of interest? NO YES

ARE **5** OR MORE ANSWERS (**A1-A3**) CODED **YES** AND IS **A4** CODED YES FOR THAT TIME FRAME?

SPECIFY IF THE EPISODE IS CURRENT AND / OR PAST.

IF **A5** IS CODED **YES**, CODE **YES** FOR RECURRENT.

**NO YES**

***MAJOR DEPRESSIVE EPISODE***

CURRENT **S** PAST **S** RECURRENT **S**

A6 a How many episodes of depression did you have in your lifetime?

Between each episode there must be at least 2 months without any significant depression.

**In the past month did you:**

**B. SUICIDALITY**

Points

B1 Suffer any accident? NO YES 0

IF NO TO B1, SKIP TO B2; IF YES, ASK B1a:

**B1a** Plan or intend to hurt yourself in that accident either actively or passively

(e.g. not avoiding a risk)? NO YES 0

IF NO TO B1a, SKIP TO B2; IF YES, ASK B1b:

B1b Intend to die as a result of this accident? NO YES 0

B2 Feel hopeless? NO YES 1

B3 Think that you would be better off dead or wish you were dead? NO YES 1

B4 Want to harm yourself or to hurt or to injure yourself or NO YES 2 have mental images of harming yourself?

B5 Think about suicide? NO YES 6

IF NO TO B5, SKIP TO B7. OTHERWISE ASK:

Frequency Intensity

	Occasionally <b>S</b> Mild <b>S</b> Often <b>S</b> Moderate <b>S</b> Very often <b>S</b> Severe <b>S</b>			
	Can you state that you will not act on these impulses during this treatment program?	NO	YES	
B6	Feel unable to control these impulses?	NO	YES	
B7	Have a suicide plan?	NO	YES	
	Take any active steps to prepare to injure yourself or to prepare for a suicide attempt			



B8	in which you expected or intended to die?	NO	YES	9
B9	Deliberately injure yourself without intending to kill yourself?	NO	YES	
B10	Attempt suicide?  IF NO SKIP TO B11:	NO	YES	9

Hope to be rescued / survive S

Expected / intended to die S

**In your lifetime:**

B11 Did you ever make a suicide attempt? NO YES 4

IS AT LEAST **1** OF THE ABOVE (EXCEPT B1) CODED **YES**?

IF YES, ADD THE TOTAL POINTS FOR THE ANSWERS (B1-B11) CHECKED 'YES' AND SPECIFY THE SUICIDALITY SCORE AS INDICATED IN THE DIAGNOSTIC BOX:

MAKE ANY ADDITIONAL COMMENTS ABOUT YOUR ASSESSMENT OF THIS PATIENT'S CURRENT AND NEAR FUTURE SUICIDALITY IN THE SPACE BELOW:

**NO YES**

***SUICIDALITY CURRENT***

1-8 points Low **S**

9-16 points Moderate **S**

≥ 17 points High **S**

## C. MANIC AND HYPOMANIC EPISODES

(· MEANS : GO TO THE DIAGNOSTIC BOXES, CIRCLE NO IN MANIC AND HYPOMANIC DIAGNOSTIC BOXES, AND MOVE TO NEXT MODULE)

Do you have any family history of manic depressive illness or bipolar disorder, or any family member who had mood swings treated with a medication like lithium, NO YES sodium valproate (Depakote) or lamotrigine (Lamictal)?

THIS QUESTION IS NOT A CRITERION FOR BIPOLAR DISORDER BUT IS ASKED TO INCREASE THE CLINICIANS VIGILANCE ABOUT RISK FOR BIPOLAR DISORDER .

IF YES, PLEASE SPECIFY WHO:

C1 a Have you **ever** had a period of time when you were feeling 'up' or 'high' or 'hyper' NO YES

or so full of energy or full of yourself that you got into trouble, // or that other people thought you were not your usual self? (Do not consider times when you were intoxicated on drugs or alcohol.)

IF PATIENT IS PUZZLED OR UNCLEAR ABOUT WHAT YOU MEAN BY 'UP' OR 'HIGH' OR 'HYPER', CLARIFY AS FOLLOWS: By 'up' or 'high' or 'hyper'

I mean: having elated mood; increased energy; needing less sleep; having rapid thoughts; being full of ideas; having an increase in productivity, motivation,

creativity, or impulsive behavior; phoning or working excessively or spending more money.

IF NO, CODE NO TO C1b: IF YES ASK:

b Are you currently feeling 'up' or 'high' or 'hyper' or full of energy? NO YES

C2 a Have you **ever** been persistently irritable, for several days, so that you NO YES

had arguments or verbal or physical fights, or shouted at people outside your family? Have you or others noticed that you have been more irritable or over reacted, compared to other people, even in situations that you felt were justified?

IF NO, CODE NO TO **C2b**; IF **YES** ASK:

b Are you currently feeling persistently irritable? NO YES

IS **C1a** OR **C2a** CODED **YES**? NO YES

**C3** IF **C1b** OR **C2b** = **YES**: EXPLORE THE **CURRENT** AND THE MOST SYMPTOMATIC **PAST** EPISODE, OTHERWISE IF **C1b** AND **C2b** = **NO**: EXPLORE ONLY THE MOST SYMPTOMATIC **PAST** EPISODE

**During the times when you felt high, full of energy, or irritable did you:**

Current Episode Past Episode

a	Feel that you could do things others couldn't do, or that you were an especially important person? IF <b>YES</b> , ASK FOR EXAMPLES.	NO	YES	NO	YES
	THE EXAMPLES ARE CONSISTENT WITH A DELUSIONAL IDEA. Current Episode S No S Yes  Past Episode S No S Yes				
b	Need less sleep (for example, feel rested after only a few hours sleep)?	NO	YES	NO	YES
c	Talk too much without stopping, or so fast that people had difficulty understanding?	NO	YES	NO	YES
d	Have racing thoughts?	NO	YES	NO	YES

Current Episode Past Episode

- e Become easily distracted so that any little interruption could distract you? NO YES NO YES
- f Have a significant increase in your activity or drive, at work, at school, socially or sexually or did you become physically or mentally restless? NO YES NO YES
- g Want so much to engage in pleasurable activities that you ignored the risks or consequences (for example, spending sprees, reckless driving, or sexual indiscretions)? NO YES NO YES

**C3 (SUMMARY):** ARE 3 OR MORE C3 ANSWERS CODED YES NO YES NO YES

(OR 4 OR MORE IF **C1a** IS **NO** (IN RATING PAST EPISODE) AND **C1b** IS **NO** (IN RATING CURRENT EPISODE)?)

RULE: ELATION/EXPANSIVENESS  
REQUIRES ONLY THREE C3 SYMPTOMS WHILE IRRITABLE MOOD ALONE REQUIRES 4 OF THE C3 SYMPTOMS.

VERIFY IF THE SYMPTOMS OCCURRED DURING THE SAME TIME PERIOD.

**C4** How long did these symptoms last?

- a) 3 days or less S S
- b) 4 to 6 days S S
- c) 7 days or more S S

Symptom Duration	No disability	Disability
1-3 days	Hypomanic Symptoms	Hypomanic Symptoms
4-6 days	Hypomanic Episode	Hypomanic Episode
7 or more days	Hypomanic Episode	Manic Episode

C5	Were you hospitalized for these problems?	NO	YES	NO	YES
	IF YES, STOP HERE AND CIRCLE YES IN MANIC EPISODE FOR THAT TIME FRAME.				
	Did these symptoms cause significant problems at home, at work, socially				

C6	in your relationships with others, at school or in some other important way?	NO	YES	NO	YES
----	--	----	-----	----	-----

ARE BOTH **C5** AND **C6** CODED **YES** AND EITHER **C4a** or **b** or **c** CODED **YES**?

OR

IS **C5** CODED **NO** AND **C6** CODED **YES** AND **C4c** CODED **YES**?

SPECIFY IF THE EPISODE IS CURRENT AND / OR PAST.

**NO YES**

***MANIC EPISODE***

CURRENT **S**

PAST **S**

ARE BOTH **C5** AND **C6** CODED **NO** AND EITHER **C4b** OR **C4c** CODED **YES**?

OR

IS **C5** CODED **NO** AND **C6** **YES** AND **C4b** CODED **YES**?

SPECIFY IF THE EPISODE IS CURRENT AND / OR PAST.

**NO YES**

***HYPOMANIC EPISODE***

CURRENT S

PAST S

ARE BOTH **C5** AND **C6** CODED **NO** AND IS **C4a** CODED **YES**?

SPECIFY IF THE EPISODE IS CURRENT AND / OR PAST.

**NO YES**

***HYPOMANIC SYMPTOMS***

CURRENT **S**

PAST **S**

IF YES TO MANIA, HYPOMANIA OR HYPOMANIC SYMPTOMS ASK:

C7 a) Did you have 2 or more manic episodes (C4c) in your lifetime (including the current episode if present)? NO YES b) Did you have 2 or more hypomanic episodes (C4b) in your lifetime (including the current episode)? NO YES c) Did you have 2 or more episodes of hypomanic symptoms (C4a) in your lifetime

(including the current episode if present)? NO YES



## D. PANIC DISORDER

(· MEANS : CIRCLE NO IN  
D5, D6 AND D7 AND SKIP TO  
E1)

D1	a	Have you, on more than one occasion, had spells or attacks when you <b>suddenly</b> felt anxious, frightened, uncomfortable or uneasy, even in situations where most people would not feel that way?	NO	YES
	b	Did the spells surge to a peak within 10 minutes of starting?	NO	YES
D2		At any time in the past, did any of those spells or attacks come on unexpectedly or occur in an unpredictable or unprovoked manner?	NO	YES
D3		Have you ever had one such attack followed by a month or more of persistent concern about having another attack, or worries about the consequences of the attack //	NO	YES
		or did you make a significant change in your behavior because of the attacks (e.g., shopping only with a companion, not wanting to leave your house, visiting the emergency room repeatedly, or seeing your doctor more frequently because of the symptoms)?		
D4		<b>During the worst attack that you can remember:</b>		
	a	Did you have skipping, racing or pounding of your heart?	NO	YES
	b	Did you have sweating or clammy hands?	NO	YES
	c	Were you trembling or shaking?	NO	YES
	d	Did you have shortness of breath or difficulty breathing?	NO	YES
	e	Did you have a choking sensation or a lump in your throat?	NO	YES

	f	Did you have chest pain, pressure or discomfort?	NO	YES
	g	Did you have nausea, stomach problems or sudden diarrhea?	NO	YES
	h	Did you feel dizzy, unsteady, lightheaded or faint?	NO	YES
	i	Did things around you feel strange, unreal, detached or unfamiliar, or did you feel outside of or detached from part or all of your body?	NO	YES
	j	Did you fear that you were losing control or going crazy?	NO	YES
	k	Did you fear that you were dying?	NO	YES
	l	Did you have tingling or numbness in parts of your body?	NO	YES
	m	Did you have hot flushes or chills?	NO	YES
D5		ARE BOTH <b>D3</b> , AND <b>4</b> OR MORE <b>D4</b> ANSWERS, CODED <b>YES</b> ?	NO	YES
		IF YES TO D5, SKIP TO D7.		<i>PANIC DISORDER LIFETIME</i>
D6		IF <b>D5</b> = <b>NO</b> , ARE ANY D4 ANSWERS CODED <b>YES</b> ?	NO	YES
		THEN SKIP TO E1.		<i>LIMITED SYMPTOM ATTACKS LIFETIME</i>

**M.I.N.I. 6.0.0 (January 1, 2008)** <sup>11</sup>

In the past month, did you have such attacks repeatedly (2 or more), and did you have

NO YES

D7

persistent concern about having another attack, or worry about the consequences  
of the attacks, or did you change your behavior in any way because of the attacks?

*PANIC  
DISORDER  
CURRENT*

## E. AGORAPHOBIA

E1	Do you feel anxious or uneasy in places or situations where help might not be available		
	or escape might be difficult, like being in a crowd, standing in a line (queue), when you		
	are alone away from home or alone at home, or when crossing a bridge, or traveling		
	in a bus, train or car or where you might have a panic attack or the panic-like	NO	YES
	symptoms we just spoke about?		

IF **E1** = **NO**, CIRCLE **NO** IN **E2**.

E2 Do you fear these situations so much that you avoid them, or suffer **NO** **YES**

through them, or need a companion to face them? *AGORAPHOBIA CURRENT*

IS **E2** (CURRENT AGORAPHOBIA) CODED **YES**

and

IS **D7** (CURRENT PANIC DISORDER) CODED **YES**?

**NO YES**

***PANIC DISORDER with Agoraphobia CURRENT***

IS **E2** (CURRENT AGORAPHOBIA) CODED **NO**

and

IS **D7** (CURRENT PANIC DISORDER) CODED **YES**?

**NO YES**

***PANIC DISORDER without Agoraphobia CURRENT***

IS **E2** (CURRENT AGORAPHOBIA) CODED **YES**

and

IS **D5** (PANIC DISORDER LIFETIME) CODED **NO**?

**NO YES**

***AGORAPHOBIA, CURRENT without history of Panic Disorder***

## **F. SOCIAL PHOBIA (Social Anxiety Disorder)**

**(· MEANS : GO TO THE DIAGNOSTIC BOX, CIRCLE NO AND MOVE TO THE NEXT MODULE)**

F1 In the past month, did you have persistent fear and significant anxiety at being watched, NO YES

being the focus of attention, or of being humiliated or embarrassed? This includes things like speaking in public, eating in public or with others, writing while someone watches,

or being in social situations.

F2 Is this social fear excessive or unreasonable and does it almost always make you anxious? NO YES

F3 Do you fear these social situations so much that you avoid them or suffer NO YES

through them most of the time?

F4 Do these social fears disrupt your normal work, school or social functioning or cause you significant distress?

### **SUBTYPES**

Do you fear and avoid 4 or more social situations?

If YES Generalized social phobia (social anxiety disorder)

If NO Non-generalized social phobia (social anxiety disorder) EXAMPLES OF SUCH

**SOCIAL SITUATIONS TYPICALLY INCLUDE**

- INITIATING OR MAINTAINING A CONVERSATION,
- PARTICIPATING IN SMALL GROUPS,
- DATING,

- SPEAKING TO AUTHORITY FIGURES,
- ATTENDING PARTIES,
- PUBLIC SPEAKING,
- EATING IN FRONT OF OTHERS,
- URINATING IN A PUBLIC WASHROOM, ETC.

NOTE TO INTERVIEWER: PLEASE ASSESS WHETHER THE SUBJECT'S FEARS ARE RESTRICTED TO NON-GENERALIZED ("ONLY 1 OR SEVERAL") SOCIAL SITUATIONS OR EXTEND TO GENERALIZED ("MOST") SOCIAL SITUATIONS. "MOST" SOCIAL SITUATIONS IS USUALLY OPERATIONALIZED TO MEAN 4 OR MORE SOCIAL SITUATIONS, ALTHOUGH THE DSM-IV DOES NOT EXPLICITLY STATE THIS.

**NO YES**

***SOCIAL PHOBIA (Social Anxiety Disorder) CURRENT***

GENERALIZED YES/NO

NON-GENERALIZED YES/NO

**M.I.N.I. 6.0.0 (January 1, 2008)** 13

## G. OBSESSIVE-COMPULSIVE DISORDER

(· MEANS: GO TO THE DIAGNOSTIC BOX, CIRCLE NO AND MOVE TO THE NEXT MODULE)

G1 In the past month, have you been bothered by recurrent thoughts, impulses, or NO YES images that were unwanted, distasteful, inappropriate, intrusive, or distressing? // ↓

(For example, the idea that you were dirty, contaminated or had germs, **or** fear of SKIP TO G4

contaminating others, **or** fear of harming someone even though it disturbs or distresses you, or fear you would act on some impulse, **or** fear or superstitions that you would

be responsible for things going wrong, **or** obsessions with sexual thoughts, images or impulses, **or** hoarding, collecting, **or** religious obsessions.)

(DO NOT INCLUDE SIMPLY EXCESSIVE WORRIES ABOUT REAL LIFE PROBLEMS. DO NOT INCLUDE OBSESSIONS DIRECTLY RELATED TO EATING DISORDERS, SEXUAL DEVIATIONS, PATHOLOGICAL GAMBLING, OR ALCOHOL OR DRUG ABUSE BECAUSE THE PATIENT MAY DERIVE PLEASURE FROM THE ACTIVITY AND MAY WANT TO RESIST IT ONLY BECAUSE OF ITS NEGATIVE CONSEQUENCES.)

G2 Did they keep coming back into your mind even when you tried to ignore or NO YES get rid of them? ↓

SKIP TO G4

G3 Do you think that these obsessions are the product of your own mind and that NO YES they are not imposed from the outside? **obsessions**

G4 In the past month, did you do something repeatedly without being able to NO YES resist doing it, like washing or cleaning excessively, counting or checking **compulsions** things over and over, or repeating, collecting, arranging things, or other

superstitious rituals?

IS G3 OR G4 CODED YES? NO YES



G5 At any point, did you recognize that either these obsessive thoughts or these NO YES

compulsive behaviors were excessive or unreasonable?

G6 In the past month, did these obsessive thoughts and/or compulsive behaviors significantly interfere with your normal routine, your work or school, your usual social activities, or relationships, or did they take more than one hour a day?

**NO YES**

***O.C.D.***

***CURRENT***

## H. POSTTRAUMATIC STRESS DISORDER

(· MEANS : GO TO THE DIAGNOSTIC BOX, CIRCLE NO, AND MOVE TO THE NEXT MODULE)

H1 Have you ever experienced or witnessed or had to deal with an extremely traumatic NO YES

event that included actual or threatened death or serious injury to you or someone else?

EXAMPLES OF TRAUMATIC EVENTS INCLUDE: SERIOUS ACCIDENTS, SEXUAL OR PHYSICAL ASSAULT, A TERRORIST ATTACK, BEING HELD HOSTAGE, KIDNAPPING, FIRE, DISCOVERING A BODY, WAR, OR NATURAL DISASTER, WITNESSING THE VIOLENT OR SUDDEN DEATH OF SOMEONE CLOSE TO YOU, OR A LIFE THREATENING ILLNESS.

H2 Did you respond with intense fear, helplessness or horror? NO YES

H3 During the past month, have you re-experienced the event in a distressing way NO YES

(such as in dreams, intense recollections, flashbacks or physical reactions) or did you have intense distress when you were exposed to a similar event?

**H4 In the past month:**

a Have you avoided thinking about or talking about the event ? NO YES b Have you avoided activities, places or people that remind you of the event? NO YES c Have you had trouble recalling some important part of what happened? NO YES d Have you become much less interested in hobbies or social activities? NO YES e Have you felt detached or estranged from others? NO YES f Have you noticed that your feelings are numbed? NO YES

g Have you felt that your life will be shortened or that you will die sooner than other people? NO YES

ARE 3 OR MORE H4 ANSWERS CODED YES? NO YES

**H5 In the past month:**

a Have you had difficulty sleeping? NO YES b Were you especially irritable or did you have outbursts of anger? NO YES c Have you had difficulty concentrating? NO YES d Were you nervous or constantly on your guard? NO YES e Were you easily startled? NO YES

ARE 2 OR MORE H5 ANSWERS CODED YES? NO YES

**NO YES**

H6 During the past month, have these problems significantly interfered with your work, school or social activities, or caused significant distress?

***POSTTRAUMATIC STRESS DISORDER CURRENT***  
**YES/NO**

## I. ALCOHOL DEPENDENCE / ABUSE

( MEANS: GO TO DIAGNOSTIC BOXES, CIRCLE NO IN BOTH AND MOVE TO THE NEXT MODULE)

I1		<p><b>In the past 12 months</b>, have you had 3 or more alcoholic drinks, - within a 3 hour period, _ on 3 or more occasions?</p>	NO	YES
I2		<p><b>In the past 12 months:</b></p>		
	a	<p>Did you need to drink a lot more in order to get the same effect that you got when you first started drinking or did you get much less effect with continued use of the same amount?</p>	NO	YES
	b	<p>When you cut down on drinking did your hands shake, did you sweat or feel agitated? Did you drink to avoid these symptoms (for example, "the shakes", sweating or agitation) or to avoid being hungover,?</p> <p>IF YES TO ANY, CODE YES.</p>	NO	YES
	c	<p>During the times when you drank alcohol, did you end up drinking more than you planned when you started?</p>	NO	YES
	d	<p>Have you tried to reduce or stop drinking alcohol but failed?</p>	NO	YES
	e	<p>On the days that you drank, did you spend substantial time in obtaining alcohol, drinking, or in recovering from the effects of alcohol?</p>	NO	YES
	f	<p>Did you spend less time working, enjoying hobbies, or being with others because of your drinking?</p>	NO	YES
	g	<p>If your drinking caused you health or mental problems, did you still keep on drinking?</p>	NO	YES

ARE 3 OR MORE I2 ANSWERS CODED YES?

\* IF YES, SKIP I3 QUESTIONS AND GO TO NEXT MODULE. “DEPENDENCE PREEMPTS ABUSE” IN DSM IV TR.

**NO YES\***

***ALCOHOL DEPENDENCE***

**CURRENT**

I3	<p><b>In the past 12 months:</b></p> <p>Have you been intoxicated, high, or hungover more than once when you had other</p> <p>a</p>		
	<p>responsibilities at school, at work, or at home? Did this cause any problems?</p> <p>(CODE YES ONLY IF THIS CAUSED PROBLEMS.)</p>		
	<p>b Were you intoxicated more than once in any situation where you were physically at risk, for example, driving a car, riding a motorbike, using machinery, boating, etc.?</p>	NO	YES
	<p>c Did you have legal problems more than once because of your drinking, for example, an arrest or disorderly conduct?</p>	NO	YES
	<p>d If your drinking caused problems with your family or other people, did you still keep on drinking?</p>	NO	YES

ARE 1 OR MORE **I3** ANSWERS CODED **YES**?

**NO YES**

***ALCOHOL ABUSE***

**CURRENT**

## J. NON-ALCOHOL PSYCHOACTIVE SUBSTANCE USE DISORDERS

(· MEANS : GO TO THE DIAGNOSTIC BOXES, CIRCLE NO IN ALL DIAGNOSTIC BOXES, AND MOVE TO THE NEXT MODULE)

Now I am going to show you / read to you a list of street drugs or medicines.

J1 a In the past 12 months, did you take any of these drugs more than once, NO YES

to get high, to feel elated, to get “a buzz” or to change your mood?

CIRCLE EACH DRUG TAKEN:

**Stimulants:** amphetamines, "speed", crystal meth, “crank”, "rush", Dexedrine, Ritalin, diet pills.

**Cocaine:** snorting, IV, freebase, crack, "speedball".

**Narcotics:** heroin, morphine, Dilaudid, opium, Demerol, methadone, Darvon, codeine, Percodan, Vicoden, OxyContin. **Hallucinogens:** LSD ("acid"), mescaline, peyote, PCP ("angel dust", "peace pill"), psilocybin, STP, "mushrooms", “ecstasy”, MDA, MDMA, or ketamine (“special K”).

**Inhalants:** "glue", ethyl chloride, “rush”, nitrous oxide ("laughing gas"), amyl or butyl nitrate ("poppers").

**Cannabis:** marijuana, hashish ("hash"), THC, "pot", "grass", "weed", "reefer".

**Tranquilizers:** Quaalude, Seconal ("reds"), Valium, Xanax, Librium, Ativan, Dalmane, Halcion, barbiturates, Miltown, GHB, Roofinol, “Roofies”.

**Miscellaneous:** steroids, nonprescription sleep or diet pills. Cough Medicine? Any others?

SPECIFY THE MOST USED DRUG(S): WHICH DRUG(S) CAUSE THE BIGGEST PROBLEMS?: FIRST EXPLORE THE DRUG CAUSING THE BIGGEST PROBLEMS AND MOST LIKELY TO MEET DEPENDENCE / ABUSE CRITERIA.

IF MEETS CRITERIA FOR ABUSE OR DEPENDENCE, SKIP TO THE NEXT MODULE. OTHERWISE, EXPLORE THE NEXT MOST PROBLEMATIC DRUG.

**J2 Considering your use of (NAME THE DRUG / DRUG CLASS SELECTED), in the past 12 months:**

Have you found that you needed to use more (NAME OF DRUG / DRUG CLASS SELECTED)

- |   |  |    |     |
|---|--|----|-----|
| a |  | NO | YES |
|   | to get the same effect that you did when you first started taking it?  |    |     |
| b | When you reduced or stopped using (NAME OF DRUG / DRUG CLASS SELECTED), did you have withdrawal symptoms (aches, shaking, fever, weakness, diarrhea, nausea, sweating, heart pounding, difficulty sleeping, or feeling agitated, anxious, irritable, or depressed)? Did you use any drug(s) to keep yourself from getting sick (withdrawal symptoms) or so that you would feel better? | NO | YES |
|   | IF YES TO EITHER, CODE YES.  |    |     |
| c | Have you often found that when you used (NAME OF DRUG / DRUG CLASS SELECTED), you ended up taking more than you thought you would?   | NO | YES |
| d | Have you tried to reduce or stop taking (NAME OF DRUG / DRUG CLASS SELECTED) but failed?   | NO | YES |
| e | On the days that you used (NAME OF DRUG / DRUG CLASS SELECTED), did you spend substantial  | NO | YES |
| f | time (>2 HOURS), obtaining, using or in recovering from the drug, or thinking about the drug? Did you spend less time working, enjoying hobbies, or being with family or friends because of your drug use?   | NO | YES |
| g | If (NAME OF DRUG / DRUG CLASS SELECTED) caused you health or mental problems, NO YES did you still keep on using it?   |    |     |



ARE 3 OR MORE J2 ANSWERS CODED YES?

SPECIFY DRUG(S):

\* IF YES, SKIP J3 QUESTIONS, MOVE TO NEXT DISORDER. "DEPENDENCE PREEMPTS ABUSE" IN DSM IV TR.

**NO YES \***

***SUBSTANCE DEPENDENCE***

**CURRENT**

		<p><b>Considering your use of (NAME THE DRUG CLASS SELECTED), in the past 12 months:</b></p> <p>Have you been intoxicated, high, or hungover from (NAME OF DRUG / DRUG CLASS SELECTED)</p>		
J3	a	<p>more than once, when you had other responsibilities at school, at work, or at home?</p> <p>Did this cause any problem?</p>	NO	YES
		(CODE YES ONLY IF THIS CAUSED PROBLEMS.)		
	b	<p>Have you been high or intoxicated from (NAME OF DRUG / DRUG CLASS SELECTED)</p> <p>more than once in any situation where you were physically at risk (for example, driving a car, riding a motorbike, using machinery, boating, etc.)?</p>	NO	YES
	c	<p>Did you have legal problems more than once because of your drug use, for example, an arrest or disorderly conduct?</p>	NO	YES
	d	<p>If (NAME OF DRUG / DRUG CLASS SELECTED) caused problems with your family or other people, did you still keep on using it?</p>	NO	YES

ARE 1 OR MORE **J3** ANSWERS CODED **YES**?

SPECIFY DRUG(S):

**NO YES**

***SUBSTANCE ABUSE***

**CURRENT**

## K. PSYCHOTIC DISORDERS AND MOOD DISORDER WITH PSYCHOTIC FEATURES

ASK FOR AN EXAMPLE OF EACH QUESTION ANSWERED POSITIVELY. CODE YES ONLY IF THE EXAMPLES CLEARLY SHOW A DISTORTION OF THOUGHT OR OF PERCEPTION OR IF THEY ARE NOT CULTURALLY APPROPRIATE. BEFORE CODING, INVESTIGATE WHETHER DELUSIONS QUALIFY AS "BIZARRE".

DELUSIONS ARE "BIZARRE" IF: CLEARLY IMPLAUSIBLE, ABSURD, NOT UNDERSTANDABLE, AND CANNOT DERIVE FROM ORDINARY LIFE EXPERIENCE.

HALLUCINATIONS ARE SCORED "BIZARRE" IF: A VOICE COMMENTS ON THE PERSON'S THOUGHTS OR BEHAVIOR, OR WHEN TWO OR MORE VOICES ARE CONVERSING WITH EACH OTHER.

THE PURPOSE OF THIS MODULE IS TO EXCLUDE PATIENTS WITH PSYCHOTIC DISORDERS. THIS MODULE NEEDS EXPERIENCE.

Now I am going to ask you about unusual experiences that some people have.

BIZARRE

K1 a Have you ever believed that people were spying on you, or that someone was plotting against you, or trying to hurt you? NO YES YES

NOTE: ASK FOR EXAMPLES TO RULE OUT ACTUAL STALKING.

b IF YES OR YES BIZARRE: do you currently believe these things?

K2 a Have you ever believed that someone was reading your mind or could hear your thoughts, or that you could actually read someone's mind or hear what another person was thinking? NO YES YES

K6

b IF YES OR YES BIZARRE: do you currently believe these things?

NO YES YES

K3 a Have you ever believed that someone or some force outside of yourself put thoughts in your mind that were not your own, or made you act in a way that was not your usual self? Have you ever felt that you were possessed?

CLINICIAN: ASK FOR EXAMPLES AND DISCOUNT ANY THAT ARE NOT PSYCHOTIC.

NO YES YES

K6

NO YES YES



	b	<b>IF YES OR YES BIZARRE:</b> do you currently believe these things?	NO	YES	YES K6
K4	a	Have you ever believed that you were being sent special messages through the TV, radio, newspapers, books or magazines or that a person you did not personally know was particularly interested in you?	NO	YES	YES
	b	<b>IF YES OR YES BIZARRE:</b> do you currently believe these things?	NO	YES	YES K6
K5	a	Have your relatives or friends ever considered any of your beliefs odd or unusual?  <small>INTERVIEWER: ASK FOR EXAMPLES. ONLY CODE YES IF THE EXAMPLES ARE CLEARLY DELUSIONAL IDEAS NOT EXPLORED IN QUESTIONS K1 TO K4. FOR EXAMPLE, SOMATIC OR RELIGIOUS DELUSIONS OR DELUSIONS OF GRANDIOSITY, JEALOUSY, GUILT, RUIN OR DESTITUTION, ETC.</small>	NO	YES	YES
	b	<b>IF YES OR YES BIZARRE:</b> do they currently consider your beliefs strange?	NO	YES	YES
K6	a	Have you ever heard things other people couldn't hear, such as voices?  <b>IF YES TO VOICE HALLUCINATION:</b> Was the voice commenting on your thoughts or behavior or did you hear two or more voices talking to each other?	NO	YES	YES
	b	<b>IF YES OR YES BIZARRE TO K6a:</b> have you heard sounds / voices in the past month?  <b>IF YES TO VOICE HALLUCINATION:</b> Was the voice commenting on your thoughts or behavior or did you hear two or more voices talking to each other?	NO	YES	YES K8b

K7 a Have you ever had visions when you were awake or have you ever seen things NO YES

other people couldn't see?

CLINICIAN: CHECK TO SEE IF THESE ARE CULTURALLY INAPPROPRIATE.

b **IF YES:** have you seen these things in the past month? NO YES

**CLINICIAN'S JUDGMENT**

K8 b IS THE PATIENT CURRENTLY EXHIBITING INCOHERENCE, DISORGANIZED NO YES

SPEECH, OR MARKED LOOSENING OF ASSOCIATIONS?

K9 b IS THE PATIENT CURRENTLY EXHIBITING DISORGANIZED OR CATATONIC NO YES

BEHAVIOR?

K10 b ARE NEGATIVE SYMPTOMS OF SCHIZOPHRENIA, E.G. SIGNIFICANT AFFECTIVE NO YES

FLATTENING, POVERTY OF SPEECH (ALOGIA) OR AN INABILITY TO INITIATE

OR PERSIST IN GOAL-DIRECTED ACTIVITIES  
(AVOLITION), PROMINENT DURING THE  
INTERVIEW?

K11 a ARE 1 OR MORE « a » QUESTIONS FROM K1a TO K7a CODED **YES OR YES BIZARRE**

AND IS EITHER:

MAJOR DEPRESSIVE EPISODE, (CURRENT, RECURRENT OR PAST)

**OR**

MANIC OR HYPOMANIC EPISODE, (CURRENT OR PAST) CODED **YES?** NO YES

**K13**

IF NO TO K11 a, CIRCLE NO IN BOTH  
'MOOD DISORDER WITH PSYCHOTIC  
FEATURES' DIAGNOSTIC BOXES AND  
MOVE TO K13.

b You told me earlier that you had period(s) when you felt (depressed/high/persistently irritable).

Were the beliefs and experiences you just described (SYMPTOMS CODED YES FROM **K1a** TO **K7a**)  
restricted exclusively to times when you were feeling depressed/high/irritable?

IF THE PATIENT EVER HAD A PERIOD OF AT LEAST 2 WEEKS OF HAVING THESE BELIEFS OR  
EXPERIENCES (PSYCHOTIC SYMPTOMS) WHEN THEY WERE NOT DEPRESSED/HIGH/IRRITABLE,  
CODE NO TO THIS DISORDER.

IF THE ANSWER IS NO TO THIS DISORDER, ALSO CIRCLE NO TO K12 AND MOVE TO K13

**NO YES**

***MOOD DISORDER WITH***

*PSYCHOTIC FEATURES*

**LIFETIME**

K12 a ARE 1 OR MORE « b » QUESTIONS FROM K1b TO K7b CODED **YES OR YES BIZARRE** AND IS  
EITHER:

MAJOR DEPRESSIVE EPISODE, (CURRENT)  
**OR**  
MANIC OR HYPOMANIC EPISODE, (CURRENT) CODED **YES?**

IF THE ANSWER IS YES TO THIS DISORDER (LIFETIME OR CURRENT), CIRCLE NO TO K13

AND K14 AND MOVE TO THE NEXT MODULE.

**NO YES**

***MOOD DISORDER WITH***

*PSYCHOTIC FEATURES*

**CURRENT**

**M.I.N.I. 6.0.0 (January 1, 2008) 21**

K13 ARE 1 OR MORE « b » QUESTIONS FROM K1b TO K6b, CODED **YES BIZARRE**?

**NO YES**

**OR**

ARE 2 OR MORE « b » QUESTIONS FROM K1b TO K10b, CODED **YES** (RATHER THAN **YES BIZARRE**)?

AND DID AT LEAST TWO OF THE PSYCHOTIC SYMPTOMS OCCUR DURING THE SAME 1 MONTH PERIOD?

***PSYCHOTIC DISORDER***

**CURRENT**

K14 IS **K13** CODED **YES**

**OR**

ARE 1 OR MORE « a » QUESTIONS FROM K1a TO K6a, CODED **YES BIZARRE**?

**OR**

ARE 2 OR MORE « a » QUESTIONS FROM K1a TO K7a, CODED **YES** (RATHER THAN **YES BIZARRE**)

AND DID AT LEAST TWO OF THE PSYCHOTIC SYMPTOMS OCCUR DURING THE SAME 1 MONTH PERIOD?

**NO YES**

***PSYCHOTIC DISORDER***

**LIFETIME**



**M.I.N.I. 6.0.0 (January 1, 2008)** 22

## L. ANOREXIA NERVOSA

(· MEANS : GO TO THE DIAGNOSTIC BOX, CIRCLE NO, AND MOVE TO THE NEXT MODULE)

L1 a How tall are you?

b. What was your lowest weight in the past 3 months?.

c IS PATIENT'S WEIGHT EQUAL TO OR BELOW THE THRESHOLD CORRESPONDING TO NO YES

HIS / HER HEIGHT? (SEE TABLE BELOW)

**In the past 3 months:**

L2 In spite of this low weight, have you tried not to gain weight? NO YES

L3 Have you intensely feared gaining weight or becoming fat, even though you were underweight? NO YES

L4 a Have you considered yourself too big / fat or that part of your body was too big / fat? NO

YES b Has your body weight or shape greatly influenced how you felt about yourself?

NO YES c Have you thought that your current low body weight was normal or excessive? NO YES

L5 ARE 1 OR MORE ITEMS FROM L4 CODED YES? NO YES

L6 FOR WOMEN ONLY: During the last 3 months, did you miss all your menstrual NO YES

periods when they were expected to occur (when you were not pregnant)?

FOR WOMEN: ARE **L5** AND **L6** CODED **YES**?

FOR MEN: IS **L5** CODED **YES**?

**NO YES**

## ***ANOREXIA NERVOSA***

### **CURRENT**

<sup>M</sup>

**HEIGHT / WEIGHT TABLE CORRESPONDING TO A BMI THRESHOLD OF 17.5 KG/ <sup>2</sup>**

**Height/  
Weight**  
ft/in

4'9 4'10 4'11 5'0 5'1 5'2 5'3 5'4 5'5 5'6 5'7 5'8 5'9 5'10 lbs. 81 84 87 89 92 96 99 102 105 108 112 115 118 122  
cm 145 147 150 152 155 158 160 163 165 168 170 173 175 178 kgs 37 38 39 41 42 43 45 46 48 49 51 52 54 55

**H  
e  
i  
g  
h  
t  
/  
W  
e  
i  
g  
h  
t**

kgs 57 59 60 62 64  
ft/in 5'11 6'0 6'1 6'2 6'3 lbs. 125 129 132 136 140 cm 180 183 185 188 191

The weight thresholds above are calculated using a body mass index (BMI) equal to or below  $17.5 \text{ kg/m}^2$  for the patient's height. This is the threshold guideline below which a person is deemed underweight by the DSM-IV and the ICD-10 Diagnostic Criteria for Research for Anorexia Nervosa.

**M.I.N.I. 6.0.0 (January 1, 2008)** <sup>23</sup>

## M. BULIMIA NERVOSA

(· MEANS : GO TO THE DIAGNOSTIC BOXES, CIRCLE NO IN ALL DIAGNOSTIC BOXES, AND MOVE TO THE NEXT MODULE)

M1 In the past three months, did you have eating binges or times when you ate NO YES

a very large amount of food within a 2-hour period?

M2 In the last 3 months, did you have eating binges as often as twice a week? NO YES

M3 During these binges, did you feel that your eating was out of control? NO YES

M4 Did you do anything to compensate for, or to prevent a weight gain from these NO YES

binges, like vomiting, fasting, exercising or taking laxatives, enemas, diuretics

(fluid pills), or other medications?

M5 Does your body weight or shape greatly influence how you feel about yourself? NO YES

M6 DO THE PATIENT'S SYMPTOMS MEET CRITERIA FOR ANOREXIA NERVOSA? NO YES



Skip to M8

M7 Do these binges occur only when you are under ( lbs./kgs.)? NO YES

INTERVIEWER: WRITE IN THE ABOVE PARENTHESIS  
THE THRESHOLD WEIGHT FOR THIS PATIENT'S  
HEIGHT FROM THE HEIGHT / WEIGHT TABLE IN THE  
ANOREXIA NERVOSA MODULE.

M8 IS M5 CODED YES AND IS EITHER M6 OR M7 CODED NO?

**NO YES**

***BULIMIA NERVOSA***

**CURRENT**

**IS M7 CODED YES? NO YES**

***ANOREXIA NERVOSA Binge Eating/Purging Type* CURRENT**

## N. GENERALIZED ANXIETY DISORDER

( MEANS : GO TO THE DIAGNOSTIC BOX, CIRCLE NO,  
AND MOVE TO THE NEXT MODULE)

N1	a	Were you excessively anxious or worried about several routine things, over the past 6 months?  IN ENGLISH, IF THE PATIENT IS UNCLEAR ABOUT WHAT YOU MEAN, PROBE  BY ASKING (Do others think that you are a “worry wart”) AND GET EXAMPLES.	NO	YES
	b	Are these anxieties and worries present most days?	NO	YES
		ARE THE PATIENT’S ANXIETY AND WORRIES RESTRICTED EXCLUSIVELY  TO, OR BETTER EXPLAINED BY, ANY DISORDER PRIOR TO THIS POINT?	NO	YES
N2		Do you find it difficult to control the worries?	NO	YES
N3		FOR THE FOLLOWING, CODE <b>NO</b> IF THE SYMPTOMS ARE CONFINED TO  FEATURES OF ANY DISORDER EXPLORED PRIOR TO THIS POINT.		
		<b>When you were anxious over the past 6 months, did you, most of the time:</b>		
	a	Feel restless, keyed up or on edge?	NO	YES
	b	Have muscle tension?	NO	YES
	c	Feel tired, weak or exhausted easily?	NO	YES
	d	Have difficulty concentrating or find your mind going blank?	NO	YES
	e	Feel irritable?	NO	YES
	f	Have difficulty sleeping (difficulty falling asleep, waking up in the middle of the night, early morning wakening or sleeping excessively)?	NO	YES
		ARE 3 OR MORE N3 ANSWERS CODED YES	NO	YES

N4 Do these anxieties and worries disrupt your normal work, school or social functioning or cause you significant distress?

**NO YES**

***GENERALIZED ANXIETY DISORDER CURRENT***

**O. RULE OUT MEDICAL, ORGANIC OR DRUG CAUSES FOR ALL DISORDERS**

IF THE PATIENT CODES POSITIVE FOR ANY CURRENT DISORDER ASK:

**Just before these symptoms began:**

O1a Were you taking any drugs or medicines? S No S Yes

O1b Did you have any medical illness? S No S Yes

IN THE CLINICIAN'S JUDGMENT: ARE EITHER OF THESE LIKELY TO BE DIRECT CAUSES OF THE PATIENT'S DISORDER? IF NECESSARY ASK ADDITIONAL OPEN-ENDED QUESTIONS.

**O2 SUMMARY: HAS AN ORGANIC CAUSE BEEN RULED OUT?** S No S Yes S Uncert



## P. ANTISOCIAL PERSONALITY DISORDER

( · MEANS : GO TO THE DIAGNOSTIC BOX AND CIRCLE NO)

P1		<p><b>Before you were 15 years old, did you:</b></p> <p>repeatedly skip school or run away from home overnight?</p> <p>a</p> <p>b</p> <p>c repeatedly lie, cheat, "con" others, or steal?</p> <p>d</p> <p>e</p> <p>f start fights or bully, threaten, or intimidate others? deliberately destroy things or start fires? deliberately hurt animals or people?</p> <p>force someone to have sex with you?</p>		
			NO	YES
			NO	YES
			NO	YES
			NO	YES
			NO	YES
			NO	YES
		ARE 2 OR MORE <b>PI</b> ANSWERS CODED YES?	NO	YES
		DO NOT CODE <b>YES</b> TO THE BEHAVIORS BELOW IF THEY ARE EXCLUSIVELY		
		POLITICALLY OR RELIGIOUSLY MOTIVATED.		
P2		<p><b>Since you were 15 years old, have you:</b></p>		
	a	repeatedly behaved in a way that others would consider irresponsible, like	NO	YES
		failing to pay for things you owed, deliberately being impulsive or deliberately		
		not working to support yourself?		
	b	done things that are illegal even if you didn't get caught (for example, destroying	NO	YES
		property, shoplifting, stealing, selling drugs, or committing a felony)?		
	c	been in physical fights repeatedly (including physical fights with your	NO	YES
		spouse or children)?		

	d	often lied or "conned" other people to get money or pleasure, or lied just for fun?	NO	YES
	e	exposed others to danger without caring?	NO	YES
	f	felt no guilt after hurting, mistreating, lying to, or stealing from others, or after damaging property?	NO	YES

ARE 3 OR MORE P2 QUESTIONS CODED YES?

**NO YES**

***ANTISOCIAL PERSONALITY DISORDER LIFETIME***

**THIS CONCLUDES THE INTERVIEW**

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**M.I.N.I. 4.6/5.0, M.I.N.I. Plus 4.6/5.0**

**Translations M.I.N.I. 4.4 or earlier versions and M.I.N.I. Screen 5.0:**

Afrikaans R. Emsley, W. Maartens

Arabic O. Osman, E. Al-Radi Bengali H. Banerjee, A. Banerjee Braille (English)

Brazilian Portuguese P. Amorim P. Amorim

Bulgarian L.G. Hranov

Chinese L. Carroll, Y-J. Lee, Y-S. Chen, C-C. Chen, C-Y. Liu, C-K. Wu, H-S. Tang, K-D. Juang, Yan-Ping  
Zheng.

Czech P. Svlosky

Danish P. Bech P. Bech, T. Schütze

Dutch/Flemish E. Griez, K. Shruers, T. Overbeek, K. Demyttenaere I. Van Vliet, H. Leroy, H. van Megen

English D. Sheehan, J. Janavs, R. Baker, K. Harnett-Sheehan, D. Sheehan, R. Baker, J. Janavs, K. Harnett-  
Sheehan, E. Knapp, M. Sheehan M. Sheehan

Estonian J. Shlik, A. Aluoja, E. Khil

Farsi/Persian K. Khooshabi, A. Zomorodi

Finnish M. Heikkinen, M. Lijeström, O. Tuominen M. Heikkinen, M. Lijeström, O. Tuominen French Y.  
Lecrubier, E. Weiller, I. Bonora, P. Amorim, J.P. Lepine Y. Lecrubier, E. Weiller, P. Amorim, T. Hergueta  
German I. v. Denffer, M. Ackenheil, R. Dietz-Bauer G. Stotz, R. Dietz-Bauer, M. Ackenheil

Greek S. Beratis T. Calligas, S. Beratis, GN Papidimitriou, T Matsoukas

CR Soldatos

Gujarati M. Patel, B. Patel, Organon

Hebrew J. Zohar, Y. Sasson R. Barda, I. Levinson, A. Aviv

Hindi C. Mittal, K. Batra, S. Gambhir, Organon

Hungarian I. Bitter, J. Balazs I. Bitter, J. Balazs

Icelandic J.G. Stefansson

Italian I. Bonora, L. Conti, M. Piccinelli, M. Tansella, G. Cassano, L. Conti, A. Rossi, P. Donda

Y. Lecrubier, P. Donda, E. Weiller

Japanese T. Otsubo, H. Watanabe, H. Miyaoka, K. Kamijima, J. Shinoda, K. Tanaka, Y. Okajima

Kannada Organon

Korean K.S. Oh and Korean Academy of Anxiety Disorders

Latvian V. Janavs, J. Janavs, I. Nagobads V. Janavs, J. Janavs

Lithuanian A. Bacevicius

Luganda WW. Muhweziosal, H. Agren

Malayalam Organon

Marathi Organon

Norwegian G. Pedersen, S. Blomhoff K.A. Leiknes , U. Malt, E. Malt, S. Leganger

Polish M. Masiak, E. Jasiak M. Masiak, E. Jasiak Portuguese P. Amorim P. Amorim,  
T. Guterres Punjabi A. Gahunia, S. Gambhir Romanian O. Driga

Russian A. Bystritsky, E. Selivra, M. Bystritsky, L. Shumyak, M. Klisinska.

Serbian I. Timotijevic I. Timotijevic

Setswana K. Ketlogetswe

Slovenian M. Kocmur

	L. Ferrando, J. Bobes-Garcia, J. Gilbert-Rahola, Y. Lecrubier	L. Ferrando, L. Franco-Alfonso, M. Soto, J. Bobes-
Spanish		Garcia, O. Soto, L. Franco, G. Heinze, C. Santana, R. Hidalgo
Swedish	M. Waern, S. Andersch, M. Humble	C. Allgulander, H. Agren M. Waern, A. Brimse, M. Humble.
Tamil		Organon
Telugu		Organon
Thai		P. Kittirattanapaiboon, S. Mahatnirunkul, P. Udomrat, P. Silpakit., M. Khamwongpin, S. Srikosai.
Turkish	T. Örnek, A. Keskiner, I. Vahip	T. Örnek, A. Keskiner, A.Engeler
Urdu		S. Gambhir
Yiddish		J. Goldman, Chana Pollack, Myrna Mniewski

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## MOOD DISORDERS: DIAGNOSTIC ALGORITHM

Consult Modules: A [Major Depressive Episode]

C [(Hypo)  
manic  
Episode]

K [Psychotic Disorders]

### MODULE L:

1 IS **K11b** CODED YES? NO YES

### MODULES A and C: Current Past

2 a CHECK IF A DELUSIONAL IDEA IS IDENTIFIED IN **A3e**? R R

b CHECK IF A DELUSIONAL IDEA IS IDENTIFIED IN **C3a**? R R

c Is a Major Depressive Episode coded YES (current or past)?

**and**

is Hypomanic Episode coded NO (current and past)?

**and**

is Manic Episode coded NO (current and past)?

**Specify:**

**WITH Psychotic Features: IF 1 = YES or 2a or 2b = YES IF depressive episode is current or past or both**

***MAJOR DEPRESSIVE DISORDER***

current past MDD R R Psychotic Features R R

d Is a Manic Episode coded YES (current or past)?

**Specify:**

**WITH Psychotic Features: IF 1 = YES or 2a or 2b = YES**

**WITH Single Manic Episode: IF Manic episode (current or past) = YES**

**and MDE(current and past) = NO**

**Specify if the most recent mood episode is manic, depressed, mixed or hypomanic or unspecified**

**Unspecified = Past Manic Episode is coded YES AND**

**Current (C3 Summary AND (C4a or C4b) AND C6 AND O2) are coded YES**

***BIPOLAR I DISORDER***

current past Bipolar I Disorder R R Psychotic Features R R Single Manic Episode R R

***Most Recent Episode*** Manic R Depressed R Mixed R Hypomanic R Unspecified R



e Is Major Depressive Episode coded YES (current or past)?

**and**

Hypomanic Episode coded YES (current or past)?

**and**

Manic Episode coded NO (current and past)?

**Specify if the most recent mood episode is hypomanic or depressed**

***BIPOLAR II DISORDER***

current past

Bipolar II Disorder R R

***Most Recent Episode***

Hypomanic R

Depressed

f Is MDE coded NO (current and past)

**and**

Is Manic Episode coded NO (current and past)?

**and is either:**

1) C7b coded YES?

**or**

2) C3 Summary coded YES?

**and**

C4a coded YES?

**and**

C7c coded YES?

***BIPOLAR DISORDER NOS***

current past

Bipolar Disorder NOS R R

## MINI PLUS

The shaded modules below are additional modules available in the MINI PLUS beyond what is available in the standard MINI. The un-shaded modules below are in the standard MINI.

These MINI PLUS modules can be inserted into or used in place of the standard MINI modules, as dictated by the specific needs of any study.

### MODULES TIME FRAME

A	MAJOR DEPRESSIVE EPISODE	Current (2 weeks) Past  Recurrent
	MOOD DISORDER DUE TO A GENERAL MEDICAL CONDITION	Current Past
	SUBSTANCE INDUCED MOOD DISORDER	Current Past
	MDE WITH MELANCHOLIC FEATURES	Current (2 weeks)
	MDE WITH ATYPICAL FEATURES	Current (2 weeks)
	MDE WITH CATATONIC FEATURES	Current (2 weeks)
B	DYSTHYMIA	Current (Past 2 years) Past
C	SUICIDALITY	Current (Past Month)  Risk: R Low R Medium R High
D	MANIC EPISODE	Current Past
	HYPOMANIC EPISODE	Current Past
	BIPOLAR I DISORDER	Current Past
	BIPOLAR II DISORDER	Current Past
	BIPOLAR DISORDER NOS	Current Past
	MANIC EPISODE DUE TO A GENERAL MEDICAL CONDITION	Current Past
	HYPOMANIC EPISODE DUE TO A GENERAL MEDICAL CONDITION	Current Past

	SUBSTANCE INDUCED MANIC EPISODE	Current
		Past
	SUBSTANCE INDUCED HYPOMANIC EPISODE	Current
		Past
E	PANIC DISORDER	Current (Past Month)
		Lifetime
	ANXIETY DISORDER WITH PANIC ATTACKS DUE TO A	Current
	SUBSTANCE INDUCED ANXIETY DISORDER WITH PANIC ATTACKS	Current
F	AGORAPHOBIA	Current
G	SOCIAL PHOBIA (Social Anxiety Disorder)	Current (Past Month)
H	SPECIFIC PHOBIA	Current
I	OBSESSIVE-COMPULSIVE DISORDER	Current (Past Month)
	OCD DUE TO A GENERAL MEDICAL CONDITION	Current
	SUBSTANCE INDUCED OCD	Current
J	POSTTRAUMATIC STRESS DISORDER	Current (Past Month)
K	ALCOHOL DEPENDENCE	Past 12 Months
	ALCOHOL DEPENDENCE	Lifetime
	ALCOHOL ABUSE	Past 12 Months
	ALCOHOL ABUSE	Lifetime
L	SUBSTANCE DEPENDENCE (Non-alcohol)	Past 12 Months
	SUBSTANCE DEPENDENCE (Non-alcohol)	Lifetime
	SUBSTANCE ABUSE (Non-alcohol)	Past 12 Months
M	PSYCHOTIC DISORDERS	Lifetime
		Current
	MOOD DISORDER WITH PSYCHOTIC FEATURES	Current

GENERAL MEDICAL CONDITION

	SCHIZOPHRENIA	Current
	SCHIZOAFFECTIVE DISORDER	Lifetime
	SCHIZOPHRENIFORM DISORDER BRIEF	Current
	PSYCHOTIC DISORDER	Lifetime
	DELUSIONAL DISORDER	Current
	PSYCHOTIC DISORDER DUE TO A GENERAL MEDICAL CONDITION	Lifetime
	SUBSTANCE INDUCED PSYCHOTIC DISORDER	Current
	PSYCHOTIC DISORDER NOS	Lifetime
		Current
		Lifetime
	MOOD DISORDER WITH PSYCHOTIC FEATURES	Current
	MOOD DISORDER NOS	Lifetime
	MAJOR DEPRESSIVE DISORDER WITH PSYCHOTIC FEATURES	Lifetime
		Current
		Past
		Current
		Past
	BIPOLAR I DISORDER WITH PSYCHOTIC FEATURES	
N	ANOREXIA NERVOSA	Current (Past 3 Months)
O	BULIMIA NERVOSA	Current (Past 3 Months)
	BULIMIA NERVOSA PURGING TYPE	Current
	BULIMIA NERVOSA NONPURGING TYPE	Current
	ANOREXIA NERVOSA, BINGE EATING/PURGING TYPE	Current
	ANOREXIA NERVOSA, RESTRICTING TYPE	Current
P	GENERALIZED ANXIETY DISORDER	Current (Past 6 Months)
	GENERALIZED ANXIETY DISORDER DUE TO A GENERAL MEDICAL CONDITION	Current
	SUBSTANCE INDUCED GAD	Current
Q	ANTISOCIAL PERSONALITY DISORDER	Lifetime
R	SOMATIZATION DISORDER	Lifetime
		Current
S	HYPOCHONDRIASIS	Current
T	BODY DYSMORPHIC DISORDER	Current
U	PAIN DISORDER	Current
V	CONDUCT DISORDER	Past 12 Months
W	ATTENTION DEFICIT/HYPERACTIVITY DISORDER (Children/Adolescents)	Past 6 Months
	ATTENTION DEFICIT/HYPERACTIVITY DISORDER (Adults)	Lifetime
		Current
X	ADJUSTMENT DISORDERS	Current
Y	PREMENSTRUAL DYSPHORIC DISORDER	Current
Z	MIXED ANXIETY/DEPRESSIVE DISORDER	Current

## C2. CAPS

**LIFE EVENTS CHECKLIST**

Listed below are a number of difficult or stressful things that sometimes happen to people. For each event check one or more of the boxes to the right to indicate that: (a) it happened to you personally, (b) you witnessed it happen to someone else, (c) you learned about it happening to someone close to you, (d) you're not sure if it fits, or (e) it doesn't apply to you.

Be sure to consider your entire life (growing up as well as adulthood) as you go through the list of events.

Event	Happened to me	Witnessed it	Learned about it	Not sure	Doesn't apply
1. Natural disaster (for example, flood, hurricane, tornado, earthquake).					
2. Fire or explosion.					
3. Transportation accident (for example, car accident, boat accident, train wreck, plane crash).					
4. Serious accident at work, home, or during recreational activity.					
5. Exposure to toxic substance (for example, dangerous chemicals, radiation).					
6. Physical assault (for example, being attacked, hit, slapped, kicked, beaten up).					
7. Assault with a weapon (for example, being shot, stabbed, threatened with a knife, gun, bomb).					
8. Sexual assault (rape, attempted rape, made to perform any type of sexual act through force or threat of harm).					
9. Other unwanted or uncomfortable sexual experience.					
10. Combat or exposure to a war-zone (in the military or as a civilian).					
11. Captivity (for example, being kidnapped, abducted, held hostage, prisoner of war).					
12. Life-threatening illness or injury.					
13. Severe human suffering.					
14. Sudden, violent death (for example, homicide, suicide).					

15. Sudden, unexpected death of someone close to you.					
16. Serious injury, harm, or death you caused to someone else.					
17. Any other very stressful event or experience.					
<p>Criterion A. The person has been exposed to a traumatic event in which both of the following were present:</p> <p>(1) the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others.</p> <p>(2) the person's response involved intense fear, helplessness, or horror. Note: In children, this may be expressed instead by disorganized or agitated behavior.</p>					

I'm going to be asking you about some difficult or stressful things that sometimes happen to people. Some examples of this are being in some type of serious accident; being in a fire, a hurricane, or an earthquake; being mugged or beaten up or attacked with a weapon; or being forced to have sex when you didn't want to. I'll start by asking you to look over a list of experiences like this and check any that apply to you. Then, if any of them do apply to you, I'll ask you to briefly describe what happened and how you felt at the time.

Some of these experiences may be hard to remember or may bring back uncomfortable memories or feelings. People often find that talking about them can be helpful, but it's up to you to decide how much you want to tell me. As we go along, if you find yourself becoming upset, let me know and we can slow down and talk about it. Also, if you have any questions or you don't understand something, please let me know. Do you have any questions before we start?

ADMINISTER CHECKLIST, THEN REVIEW AND INQUIRE UP TO THREE EVENTS. IF MORE THAN THREE EVENTS ENDORSED, DETERMINE WHICH THREE EVENTS TO INQUIRE (E.G., FIRST, WORST, AND MOST RECENT EVENTS; THREE WORST EVENTS; TRAUMA OF INTEREST PLUS TWO OTHER WORST EVENTS, ETC.)

IF NO EVENTS ENDORSED ON CHECKLIST: *(has there ever been a time when your life was in danger or you were seriously injured or harmed?)*

IF NO: *(What about a time when you were threatened with death or serious injury, even if you weren't actually injured or harmed?)*

IF NO: *(What about witnessing something like this happen to someone else or finding out that it happened to someone close to you?)*







<p>4 Daily or almost every day</p> <p><u>Description/Examples</u></p>	<p>dismissing memories, marked disruption of activities</p> <p>4 Extreme, incapacitating distress, cannot dismiss memories, unable to continue activities</p> <p>QV (Specify)</p> <p>_____</p>	<p><u>Lifetime</u></p> <p>F ____</p> <p>I ____</p> <p>Sx: Y N</p>
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2. (B-2) recurrent distressing dreams of the event. Note: In children, there may be frightening dreams without recognizable content.

<p><u>Frequency</u></p> <p>Have you ever had unpleasant dreams about (EVENT)? Describe a typical dream. (<i>What happens in them?</i>) How often have you had these dreams in the past month (<i>week</i>)?</p> <p>0 Never 1 Once or twice 2 Once or twice a week 3 Several times a week 4 Daily or almost every day</p> <p><u>Description/Examples</u></p>	<p><u>Intensity</u></p> <p>How much distress or discomfort did these dreams cause you? Did they ever wake you up? [IF YES:] <i>What happened when you woke up? How long did it take you to get back to sleep?</i> [LISTEN FOR REPORT OF ANXIOUS AROUSAL, YELLING, ACTING OUT THE NIGHTMARE] (<i>Did your dreams ever affect anyone else? How so?</i>)</p> <p>0 None 1 Mild, minimal distress, may not have awoken 2 Moderate, awoke in distress but readily returned to sleep 3 Severe, considerable distress, difficulty returning to sleep 4 Extreme, incapacitating distress, did not return to sleep</p> <p>QV (Specify)</p> <p>_____</p>	<p><u>Past week</u></p> <p>F ____</p> <p>I ____</p> <p><u>Past month</u></p> <p>F ____</p> <p>I ____</p> <p>Sx: Y N</p> <p><u>Lifetime</u></p> <p>F ____</p> <p>I ____</p> <p>Sx: Y N</p>
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3. (B-3) acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and dissociative flashback episodes, including those that occur on awakening or when intoxicated). Note: In young children, trauma-specific reenactment may occur.

<p><u>Frequency</u></p> <p>Have you ever suddenly acted or felt as if (EVENT) were happening again? (<i>Have you ever had flashbacks about [event]?</i>) [IF NOT CLEAR:] (<i>Did this ever occur while you were awake, or only in dreams?</i>) [EXCLUDE IF OCCURRED ONLY DURING DREAMS] Tell me more about that. How often has that happened in the past month (<i>week</i>)?</p> <p>0 Never 1 Once or twice</p>	<p><u>Intensity</u></p> <p>How much did it seem as if (EVENT) were happening again? (<i>Were you confused about where you actually were or what you were doing at the time?</i>) How long did it last? What did you do while this was happening? (<i>Did other people notice your behavior? What did they say?</i>)</p> <p>0 None 1 Mild, somewhat more realistic than just thinking about event 2 Moderate, definite but transient dissociative</p>	<p><u>Past week</u></p> <p>F ____</p> <p>I ____</p> <p><u>Past month</u></p> <p>F ____</p> <p>I ____</p> <p>Sx: Y N</p>
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<p>2 Once or twice a week 3 Several times a week 4 Daily or almost every day</p> <p><u>Description/Examples</u></p>	<p>quality, still very aware of surroundings, daydreaming quality</p> <p>3 Severe, strongly dissociative (reports images, sounds, or smells) but retained some awareness of surroundings</p> <p>4 Extreme, complete dissociation (flashback), no awareness of surroundings, may be unresponsive, possible amnesia for the episode (blackout)</p> <p>QV (Specify) _____</p>	<p><u>Lifetime</u></p> <p>F ____ I ____ Sx: Y N</p>
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4. (B-4) intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event

<p><u>Frequency</u></p> <p>Have you ever gotten emotionally upset when something reminded you of (EVENT)? (Has anything ever triggered bad feelings related to [EVENT]?) What kinds of reminders made you upset? How often in the past month (week)?</p> <p>0 Never 1 Once or twice 2 Once or twice a week 3 Several times a week 4 Daily or almost every day</p> <p><u>Description/Examples</u></p>	<p><u>Intensity</u></p> <p>How much distress or discomfort did (REMINDERS) cause you? How long did it last? How much did it interfere with your life?</p> <p>0 None 1 Mild, minimal distress or disruption of activities 2 Moderate, distress clearly present but still manageable, some disruption of activities 3 Severe, considerable distress, marked disruption of activities 4 Extreme, incapacitating distress, unable to continue activities</p> <p>QV (Specify) _____</p>	<p><u>Past week</u></p> <p>F ____ I ____</p> <p><u>Past month</u></p> <p>F ____ I ____ Sx: Y N</p> <p><u>Lifetime</u></p> <p>F ____ I ____ Sx: Y N</p>
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5. (B-5) physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event

<p><u>Frequency</u></p> <p>Have you ever had any physical reactions when something reminded you of (EVENT)? (Did your body ever react in some way when something reminded you of [EVENT]?) Can you give me some examples? (Did your heart race or did your breathing change? What about sweating or feeling really tense or shaky?) What kinds of reminders triggered these reactions? How often in the past month (week)?</p> <p>0 Never</p>	<p><u>Intensity</u></p> <p>How strong were (PHYSICAL REACTIONS)? How long did they last? (Did they last even after you were out of the situation?)</p> <p>0 No physical reactivity 1 Mild, minimal reactivity 2 Moderate, physical reactivity clearly present, may be sustained if exposure continues 3 Severe, marked physical reactivity, sustained throughout exposure 4 Extreme, dramatic physical reactivity,</p>	<p><u>Past week</u></p> <p>F ____ I ____</p> <p><u>Past month</u></p> <p>F ____ I ____ Sx: Y N</p>
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<p>1 Once or twice 2 Once or twice a week 3 Several times a week 4 Daily or almost every day</p> <p><u>Description/Examples</u></p>	<p>sustained arousal even after exposure has ended</p> <p>QV (Specify)</p> <hr/>	<p><u>Lifetime</u></p> <p>F ____ I ____ Sx: Y N</p>
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Criterion C. Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three (or more) of the following:

6. (C-1) efforts to avoid thoughts, feelings, or conversations associated with the trauma

<p><u>Frequency</u> Have you ever tried to avoid thoughts or feelings about (EVENT)? (What kinds of thoughts or feelings did you try to avoid?) What about trying to avoid talking with other people about it? (Why is that?) How often in the past month (week)?</p> <p>0 Never 1 Once or twice 2 Once or twice a week 3 Several times a week 4 Daily or almost every day</p> <p><u>Description/Examples</u></p>	<p><u>Intensity</u> How much effort did you make to avoid (THOUGHTS/FEELINGS/CONVERSATIONS)? (What kinds of things did you do? What about drinking or using medication or street drugs?) [CONSIDER ALL ATTEMPTS AT AVOIDANCE, INCLUDING DISTRACTION, SUPPRESSION, AND USE OF ALCOHOL/DRUGS] How much did that interfere with your life?</p> <p>0 None 1 Mild, minimal effort, little or no disruption of activities 2 Moderate, some effort, avoidance definitely present, some disruption of activities 3 Severe, considerable effort, marked avoidance, marked disruption of activities, or involvement in certain activities as avoidant strategy 4 Extreme, drastic attempts at avoidance, unable to continue activities, or excessive involvement in certain activities as avoidant strategy</p> <p>QV (Specify)</p> <hr/>	<p><u>Past week</u></p> <p>F ____ I ____</p> <p><u>Past month</u></p> <p>F ____ I ____ Sx: Y N</p> <p><u>Lifetime</u></p> <p>F ____ I ____ Sx: Y N</p>
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7. (C-2) efforts to avoid activities, places, or people that arouse recollections of the trauma

<p><u>Frequency</u> Have you ever tried to avoid certain activities, places, or people that reminded you of (EVENT)? (What kinds of things did you avoid? Why is that?) How often in the past month (week)?</p>	<p><u>Intensity</u> How much effort did you make to avoid (ACTIVITIES/PLACES/PEOPLE)? (What did you do instead?) How much did that interfere with your life?</p>	<p><u>Past week</u></p> <p>F ____ I ____</p>
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<p>0 Never 1 Once or twice 2 Once or twice a week 3 Several times a week 4 Daily or almost every day</p> <p><u>Description/Examples</u></p>	<p>0 None 1 Mild, minimal effort, little or no disruption of activities 2 Moderate, some effort, avoidance definitely present, some disruption of activities 3 Severe, considerable effort, marked avoidance, marked disruption of activities or involvement in certain activities as avoidant strategy 4 Extreme, drastic attempts at avoidance, unable to continue activities, or excessive involvement in certain activities as avoidant strategy</p> <p>QV (Specify)</p> <hr/>	<p><u>Past month</u></p> <p>F ____ I ____ Sx: Y N</p> <p><u>Lifetime</u></p> <p>F ____ I ____ Sx: Y N</p>
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8. (C-3) inability to recall an important aspect of the trauma

<p><u>Frequency</u> Have you ever had difficulty remembering some important parts of (EVENT)? Tell me more about that. (Do you feel you should be able to remember these things? Why do you think you can't?) In the past month (week), how much of the important parts of (EVENT) have you had difficulty remembering? (What parts do you still remember?)</p> <p>0 None, clear memory 1 Few aspects not remembered (less than 10%) 2 Some aspects not remembered (approx 20-30%) 3 Many aspects not remembered (approx 50-60%) 4 Most or all aspects not remembered (more than 80%)</p> <p><u>Description/Examples</u></p>	<p><u>Intensity</u> How much difficulty did you have recalling important parts of (EVENT)? (Were you able to recall more if you tried?)</p> <p>0 None 1 Mild, minimal difficulty 2 Moderate, some difficulty, could recall with effort 3 Severe, considerable difficulty, even with effort 4 Extreme, completely unable to recall important aspects of event</p> <p>QV (Specify)</p> <hr/>	<p><u>Past week</u></p> <p>F ____ I ____</p> <p><u>Past month</u></p> <p>F ____ I ____ Sx: Y N</p> <p><u>Lifetime</u></p> <p>F ____ I ____ Sx: Y N</p>
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9. (C-4) markedly diminished interest or participation in significant activities

<p><u>Frequency</u> Have you ever been less interested in activities</p>	<p><u>Intensity</u> How strong was your loss of interest? (Would you</p>	<p><u>Past week</u></p>
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<p>that you used to enjoy? (<i>What kinds of things have you lost interest in? Are there some things you don't do at all anymore? Why is that?</i>)                  [EXCLUDE IF NO OPPORTUNITY, IF PHYSICALLY UNABLE, OR IF DEVELOPMENTALLY APPROPRIATE CHANGE IN PREFERRED ACTIVITIES] In the past month (<i>week</i>), how many activities have you been less interested in? (<i>What kinds of things do you still enjoy doing?</i>) When did you first start to feel that way? (<i>After the [EVENT]?</i>)</p> <p>0 None                  1 Few activities (less than 10%)                  2 Some activities (approx 20-30%)                  3 Many activities (approx 50-60%)                  4 Most or all activities (more than 80%)</p> <p><u>Description/Examples</u></p>	<p>enjoy [ACTIVITIES] once you got started?)</p> <p>0 No loss of interest                  1 Mild, slight loss of interest, probably would enjoy after starting activities                  2 Moderate, definite loss of interest, but still has some enjoyment of activities                  3 Severe, marked loss of interest in activities                  4 Extreme, complete loss of interest, no longer participates in any activities</p> <p>QV (<i>Specify</i>)                  _____</p> <p>Trauma-related? 1 definite 2 probable 3 unlikely                  Current _____ Lifetime _____</p>	<p>F ____                  I ____</p> <p><u>Past month</u></p> <p>F ____                  I ____                  Sx: Y N</p> <p><u>Lifetime</u></p> <p>F ____                  I ____                  Sx: Y N</p>
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10. (C-5) feeling of detachment or estrangement from others

<p><u>Frequency</u>                  Have you felt distant or cut off from other people? What was that like? How much of the time in the past month (<i>week</i>) have you felt that way? When did you first start to feel that way? (<i>After the [EVENT]?</i>)</p> <p>0 None of the time                  1 Very little of the time (less than 10%)                  2 Some of the time (approx 20-30%)                  3 Much of the time (approx 50-60%)                  4 Most or all of the time (more than 80%)</p> <p><u>Description/Examples</u></p>	<p><u>Intensity</u>                  How strong were your feelings of being distant or cut off from others? (<i>Who do you feel closest to? How many people do you feel comfortable talking with about personal things?</i>)</p> <p>0 No feelings of detachment or estrangement                  1 Mild, may feel "out of synch" with others                  2 Moderate, feelings of detachment clearly present, but still feels some interpersonal connection                  3 Severe, marked feelings of detachment or estrangement from most people, may feel close to only one or two people                  4 Extreme, feels completely detached or estranged from others, not close with anyone</p> <p>QV (<i>Specify</i>)                  _____</p> <p>Trauma-related? 1 definite 2 probable 3 unlikely                  Current _____ Lifetime _____</p>	<p><u>Past week</u></p> <p>F ____                  I ____</p> <p><u>Past month</u></p> <p>F ____                  I ____                  Sx: Y N</p> <p><u>Lifetime</u></p> <p>F ____                  I ____                  Sx: Y N</p>
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11. (C-6) restricted range of affect (e.g., unable to have loving feelings)

<p><u>Frequency</u>                  Have there been times when you felt emotionally</p>	<p><u>Intensity</u>                  How much trouble did you have experiencing</p>	<p><u>Past week</u></p>
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<p>numb or had trouble experiencing feelings like love or happiness? What was that like? (<i>What feelings did you have trouble experiencing?</i>) How much of the time in the past month (<i>week</i>) have you felt that way? When did you first start having trouble experiencing (EMOTIONS)? (<i>After the [EVENT]?</i>)</p> <p>0 None of the time          1 Very little of the time (less than 10%)          2 Some of the time (approx 20-30%)          3 Much of the time (approx 50-60%)          4 Most or all of the time (more than 80%)</p> <p><u>Description/Examples</u></p>	<p>(EMOTIONS)? (<i>What kinds of feelings were you still able to experience?</i>) [INCLUDE OBSERVATIONS OF RANGE OF AFFECT DURING INTERVIEW]</p> <p>0 No reduction of emotional experience          1 Mild, slight reduction of emotional experience          2 Moderate, definite reduction of emotional experience, but still able to experience most emotions          3 Severe, marked reduction of experience of at least two primary emotions (e.g., love, happiness)          4 Extreme, completely lacking emotional experience</p> <p>QV (<i>Specify</i>)</p> <p>_____</p> <p>Trauma-related? 1 definite 2 probable 3 unlikely          Current _____ Lifetime _____</p>	<p>F ____          I ____</p> <p><u>Past month</u></p> <p>F ____          I ____          Sx: Y N</p> <p><u>Lifetime</u></p> <p>F ____          I ____          Sx: Y N</p>
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12. (C-7) sense of a foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal life

span)

<p><u>Frequency</u></p> <p>Have there been times when you felt there is no need to plan for the future, that somehow your future will be cut short? Why is that? [RULE OUT REALISTIC RISKS SUCH AS LIFE-THREATENING MEDICAL CONDITIONS] How much of the time in the past month (<i>week</i>) have you felt that way? When did you first start to feel that way? (<i>After the [EVENT]?</i>)</p> <p>0 None of the time          1 Very little of the time (less than 10%)          2 Some of the time (approx 20-30%)          3 Much of the time (approx 50-60%)          4 Most or all of the time (more than 80%)</p> <p><u>Description/Examples</u></p>	<p><u>Intensity</u></p> <p>How strong was this feeling that your future will be cut short? (<i>How long do you think you will live? How convinced are you that you will die prematurely?</i>)</p> <p>0 No sense of a foreshortened future          1 Mild, slight sense of a foreshortened future          2 Moderate, sense of a foreshortened future definitely present, but no specific prediction about longevity          3 Severe, marked sense of a foreshortened future, may make specific prediction about longevity          4 Extreme, overwhelming sense of a foreshortened future, completely convinced of premature death</p> <p>QV (<i>Specify</i>)</p> <p>_____</p> <p>Trauma-related? 1 definite 2 probable 3 unlikely          Current _____ Lifetime _____</p>	<p><u>Past week</u></p> <p>F ____          I ____</p> <p><u>Past month</u></p> <p>F ____          I ____          Sx: Y N</p> <p><u>Lifetime</u></p> <p>F ____          I ____          Sx: Y N</p>
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Criterion D. Persistent symptoms of increased arousal (not present before the trauma), as indicated by two (or

more) of the following:

13. (D-1) difficulty falling or staying asleep

<p><u>Frequency</u> Have you had any problems falling or staying asleep? How often in the past month (<i>week</i>)? When did you first start having problems sleeping? (<i>After the [EVENT]?</i>)</p> <p>0 Never 1 Once or twice 2 Once or twice a week 3 Several times a week 4 Daily or almost every day</p> <p>Sleep onset problems? Y N Mid-sleep awakening? Y N Early a.m. awakening? Y N Total # hrs sleep/night _____ Desired # hrs sleep/night _____</p>	<p><u>Intensity</u> How much of a problem did you have with your sleep? (<i>How long did it take you to fall asleep? How often did you wake up in the night? Did you often wake up earlier than you wanted to? How many total hours did you sleep each night?</i>)</p> <p>0 No sleep problems 1 Mild, slightly longer latency, or minimal difficulty staying asleep (up to 30 minutes loss of sleep) 2 Moderate, definite sleep disturbance, clearly longer latency, or clear difficulty staying asleep (30-90 minutes loss of sleep) 3 Severe, much longer latency, or marked difficulty staying asleep (90 min to 3 hrs loss of sleep) 4 Extreme, very long latency, or profound difficulty staying asleep (&gt; 3 hrs loss of sleep)</p> <p>QV (<i>Specify</i>) _____</p> <p><i>Trauma-related? 1 definite 2 probable 3 unlikely</i> Current _____ Lifetime _____</p>	<p><u>Past week</u> F ____ I ____</p> <p><u>Past month</u> F ____ I ____ Sx: Y N</p> <p><u>Lifetime</u> F ____ I ____ Sx: Y N</p>
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14. (D-2) irritability or outbursts of anger

<p><u>Frequency</u> Have there been times when you felt especially irritable or showed strong feelings of anger? Can you give me some examples? How often in the past month (<i>week</i>)? When did you first start feeling that way? (<i>After the [EVENT]?</i>)</p> <p>0 Never 1 Once or twice 2 Once or twice a week 3 Several times a week 4 Daily or almost every day</p> <p><u>Description/Examples</u> _____</p>	<p><u>Intensity</u> How strong was your anger? (<i>How did you show it?</i>) [IF REPORTS SUPPRESSION:] (<i>How hard was it for you to keep from showing your anger?</i>) How long did it take you to calm down? Did your anger cause you any problems?</p> <p>0 No irritability or anger 1 Mild, minimal irritability, may raise voice when angry 2 Moderate, definite irritability or attempts to suppress anger, but can recover quickly 3 Severe, marked irritability or marked attempts to suppress anger, may become verbally or physically aggressive when angry 4 Extreme, pervasive anger or drastic attempts to suppress anger, may have episodes of physical violence</p> <p>QV (<i>Specify</i>) _____</p>	<p><u>Past week</u> F ____ I ____</p> <p><u>Past month</u> F ____ I ____ Sx: Y N</p> <p><u>Lifetime</u> F ____ I ____ Sx: Y N</p>
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	<p>_____</p> <p>Trauma-related? 1 definite 2 probable 3 unlikely</p> <p>Current _____ Lifetime _____</p>	
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15. (D-3) difficulty concentrating

<p><u>Frequency</u></p> <p>Have you found it difficult to concentrate on what you were doing or on things going on around you? What was that like? How much of the time in the past month (<i>week</i>)? When did you first start having trouble concentrating? (<i>after the [EVENT]?</i>)</p> <p>0 None of the time          1 Very little of the time (less than 10%)          2 Some of the time (approx 20-30%)          3 Much of the time (approx 50-60%)          4 Most or all of the time (more than 80%)</p> <p><u>Description/Examples</u></p>	<p><u>Intensity</u></p> <p>How difficult was it for you to concentrate? [INCLUDE OBSERVATIONS OF CONCENTRATION AND ATTENTION IN INTERVIEW] How much did that interfere with your life?</p> <p>0 No difficulty with concentration          1 Mild, only slight effort needed to concentrate, little or no disruption of activities          2 Moderate, definite loss of concentration but could concentrate with effort, some disruption of activities          3 Severe, marked loss of concentration even with effort, marked disruption of activities          4 Extreme, complete inability to concentrate, unable to engage in activities</p> <p>QV (<i>Specify</i>)</p> <p>_____</p> <p>Trauma-related? 1 definite 2 probable 3 unlikely</p> <p>Current _____ Lifetime _____</p>	<p><u>Past week</u></p> <p>F ____          I ____</p> <p><u>Past month</u></p> <p>F ____          I ____          Sx: Y N</p> <p><u>Lifetime</u></p> <p>F ____          I ____          Sx: Y N</p>
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16. (D-4) hypervigilance

<p><u>Frequency</u></p> <p>Have you been especially alert or watchful, even when there was no real need to be? (<i>Have you felt as if you were constantly on guard?</i>) Why is that? How much of the time in the past month (<i>week</i>)? When did you first start acting that way? (<i>After the [EVENT]?</i>)</p> <p>0 None of the time          1 Very little of the time (less than 10%)          2 Some of the time (approx 20-30%)          3 Much of the time (approx 50-60%)          4 Most or all of the time (more than 80%)</p> <p><u>Description/Examples</u></p>	<p><u>Intensity</u></p> <p>How hard did you try to be watchful of things going on around you? [INCLUDE OBSERVATIONS OF HYPERVIGILANCE IN INTERVIEW] Did your (HYPERVIGILANCE) cause you any problems?</p> <p>0 No hypervigilance          1 Mild, minimal hypervigilance, slight heightening of awareness          2 Moderate, hypervigilance clearly present, watchful in public (e.g., chooses safe place to sit in a restaurant or movie theater)          3 Severe, marked hypervigilance, very alert, scans environment for danger, exaggerated concern for safety of self/family/home          4 Extreme, excessive hypervigilance, efforts to ensure safety consume significant time and energy and may involve extensive safety/checking behaviors, marked</p>	<p><u>Past week</u></p> <p>F ____          I ____</p> <p><u>Past month</u></p> <p>F ____          I ____          Sx: Y N</p> <p><u>Lifetime</u></p> <p>F ____          I ____          Sx: Y N</p>
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	watchfulness during interview  QV (Specify) _____  Trauma-related? 1 definite 2 probable 3 unlikely Current _____ Lifetime _____	
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17. (D-5) exaggerated startle response

<p><u>Frequency</u>                  Have you had any strong startle reactions? When did that happen? (<i>What kinds of things made you startle?</i>) How often in the past month (<i>week</i>)? When did you first have these reactions? (<i>After the [EVENT]?</i>)</p> <p>0 Never                  1 Once or twice                  2 Once or twice a week                  3 Several times a week                  4 Daily or almost every day</p> <p><u>Description/Examples</u>                   _____</p>	<p><u>Intensity</u>                  How strong were these startle reactions? (<i>How strong were they compared to how most people would respond?</i>) How long did they last?</p> <p>0 No startle reaction                  1 Mild, minimal reaction                  2 Moderate, definite startle reaction, feels “jumpy”                  3 Severe, marked startle reaction, sustained arousal following initial reaction                  4 Extreme, excessive startle reaction, overt coping behavior (e.g., combat veteran who “hits the dirt”)</p> <p>QV (Specify)                  _____</p> <p>Trauma-related? 1 definite 2 probable 3 unlikely                  Current _____ Lifetime _____</p>	<p><u>Past week</u>                  F ____                  I ____</p> <p><u>Past month</u>                  F ____                  I ____                  Sx: Y N</p> <p><u>Lifetime</u>                  F ____                  I ____                  Sx: Y N</p>
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Criterion E. Duration of the disturbance (symptoms in Criteria B, C, and D) is more than 1 month.

18. Onset of symptoms

[IF NOT ALREADY CLEAR:] When did you first start having (PTSD SYMPTOMS) you’ve told me about? ( <i>How long after the trauma did they start? More than six months?</i> )	_____ total # months delay in onset With delayed onset (≥ 6 months)? NO YES
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19. duration of symptoms

[CURRENT] How long have these (PTSD SYMPTOMS) lasted altogether?	Duration more than 1 month?  Total # months duration	<u>Current</u> NO YES _____	<u>Lifetime</u> NO YES _____
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[LIFETIME] How long did these (PTSD SYMPTOMS) last altogether?	Acute (< 3 months) or chronic (≥ 3 months)?	acute chronic	acute chronic
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Criterion F. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

20. subjective distress

[CURRENT] Overall, how much have you been bothered by these (PTSD SYMPTOMS) you've told me about? [CONSIDER DISTRESS REPORTED ON EARLIER ITEMS]	0	None	<u>Past week</u>
	1	Mild, minimal distress	—
[LIFETIME] Overall, how much have you been bothered by these (PTSD SYMPTOMS) you've told me about? [CONSIDER DISTRESS REPORTED ON EARLIER ITEMS]	2	Moderate, distress clearly present but still manageable	<u>Past month</u>
	3	Severe, considerable distress	—
	4	Extreme, incapacitating distress	<u>Lifetime</u>
			—

21. impairment in social functioning

[CURRENT] Have these (PTSD SYMPTOMS) affected your relationships with other people? How so? [CONSIDER IMPAIRMENT IN SOCIAL FUNCTIONING REPORTED ON EARLIER ITEMS]	0	No adverse impact	<u>Past week</u>
	1	Mild impact, minimal impairment in social functioning	—
[LIFETIME] Did these (PTSD SYMPTOMS) affect your social life? How so? [CONSIDER IMPAIRMENT IN SOCIAL FUNCTIONING REPORTED ON EARLIER ITEMS]	2	Moderate impact, definite impairment, but many aspects of social functioning still intact	<u>Past month</u>
	3	Severe impact, marked impairment, few aspects of social functioning still intact	—
	4	Extreme impact, little or no social functioning	<u>Lifetime</u>
			—

22. impairment in occupational or other important area of functioning

[CURRENT - - IF NOT ALREADY CLEAR] Are you working now?  IF YES: Have these (PTSD SYMPTOMS) affected your work or your ability to work? How so? [CONSIDER REPORTED WORK HISTORY, INCLUDING NUMBER AND DURATION OF JOBS, AS WELL AS THE QUALITY OF WORK RELATIONSHIPS. IF PREMORBID FUNCTIONING IS UNCLEAR, INQUIRE ABOUT WORK EXPERIENCES BEFORE THE TRAUMA. FOR CHILD/ADOLESCENT TRAUMAS, ASSESS PRE-TRAUMA SCHOOL PERFORMANCE AND POSSIBLE PRESENCE OF BEHAVIOR	0	No adverse impact	<u>Past week</u>
	1	Mild impact, minimal impairment in occupational/other important functioning	—
	2	Moderate impact, definite impairment, but many aspects of occupational/other important functioning still intact	<u>Past month</u>
	3	Severe impact, marked impairment, few aspects of occupational/other important functioning still intact	—
	4	Extreme impact, little or no occupational/other important functioning	<u>Lifetime</u>
			—

<p>PROBLEMS]</p> <p>IF NO: Have these (PTSD SYMPTOMS) affected any other important part of your life? [AS APPROPRIATE, SUGGEST EXAMPLES SUCH AS PARENTING, HOUSEWORK, SCHOOLWORK, VOLUNTEER WORK, ETC.] How so?</p> <p>[LIFETIME - - IF NOT ALREADY CLEAR] Where you working then?</p> <p>IF YES: Have these (PTSD SYMPTOMS) affected your work or your ability to work? How so? [CONSIDER REPORTED WORK HISTORY, INCLUDING NUMBER AND DURATION OF JOBS, AS WELL AS THE QUALITY OF WORK RELATIONSHIPS. IF PREMORBID FUNCTIONING IS UNCLEAR, INQUIRE ABOUT WORK EXPERIENCES BEFORE THE TRAUMA. FOR CHILD/ADOLESCENT TRAUMAS, ASSESS PRE-TRAUMA SCHOOL PERFORMANCE AND POSSIBLE PRESENCE OF BEHAVIOR PROBLEMS]</p> <p>IF NO: Have these (PTSD SYMPTOMS) affected any other important part of your life? [AS APPROPRIATE, SUGGEST EXAMPLES SUCH AS PARENTING, HOUSEWORK, SCHOOLWORK, VOLUNTEER WORK, ETC.] How so?</p>		
Global Ratings		

23. global validity

<p>ESTIMATE THE OVERALL VALIDITY OF RESPONSES. CONSIDER FACTORS SUCH AS COMPLIANCE WITH THE INTERVIEW, MENTAL STATUS (E.G., PROBLEMS WITH CONCENTRATION, COMPREHENSION OF ITEMS, DISSOCIATION), AND EVIDENCE OF EFFORTS TO EXAGGERATE OR MINIMIZE SYMPTOMS.</p>	<p>0 Excellent, no reason to suspect invalid responses</p> <p>1 Good, factors present that may adversely affect validity</p> <p>2 Fair, factors present that definitely reduce validity</p> <p>3 Poor, substantially reduced validity</p> <p>4 Invalid responses, severely impaired mental status or possible deliberate “faking bad” or “faking good”</p>
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24. global severity

<p>ESTIMATE THE OVERALL SEVERITY OF PTSD SYMPTOMS. CONSIDER DEGREE OF SUBJECTIVE DISTRESS, DEGREE OF FUNCTIONAL IMPAIRMENT, OBSERVATIONS OF BEHAVIORS IN INTERVIEW, AND JUDGMENT REGARDING</p>	<p>0 No clinically significant symptoms, no distress and no functional impairment</p> <p>1 Mild, minimal distress or functional impairment</p> <p>2 Moderate, definite distress or functional impairment but functions satisfactorily with</p>	<p><u>Past week</u></p> <p>—</p> <p><u>Past month</u></p> <p>—</p>
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REPORTING STYLE.	<p>effort</p> <p>3 Severe, considerable distress or functional impairment, limited functioning even with effort</p> <p>4 Extreme, marked distress or marked impairment in two major or more areas of functioning</p>	<p><u>Lifetime</u></p> <p>—</p>
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25. global improvement

<p>RATE TOTAL OVERALL IMPROVEMENT PRESENT SINCE THE INITIAL RATING. IF NO EARLIER RATING, ASK HOW THE SYMPTOMS ENDORSED HAVE CHANGED OVER THE PAST 6 MONTHS. RATE THE DEGREE OF CHANGE WHETHER OR NOT, IN YOUR JUDGMENT, IT IS DUE TO TREATMENT.</p>	<p>0 Asymptomatic</p> <p>1 Considerable improvement</p> <p>2 Moderate improvement</p> <p>3 Slight improvement</p> <p>4 No improvement</p> <p>5 Insufficient information</p>
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<p><u>Description/Examples</u></p>	<p>incapacitating distress</p> <p>QV (Specify)</p> <hr/>	<p><u>Lifetime</u></p> <p>F ____</p> <p>I ____</p> <p>Sx: Y N</p>
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27. survivor guilt [APPLICABLE ONLY IF MULTIPLE VICTIMS]

<p><u>Frequency</u></p> <p>Have you felt guilty about surviving (EVENT) when others did not? Tell me more about that. (What do you feel guilty about?) How much of the time have you felt that way in the past month (week)?</p> <p>5 None of the time          6 Very little of the time (less than 10%)          7 Some of the time (approx 20-30%)          8 Much of the time (approx 50-60%)          9 Most or all of the time (more than 80%)</p> <p><u>Description/Examples</u></p>	<p><u>Intensity</u></p> <p>How strong were these feelings of guilt? How much distress or discomfort did they cause?</p> <p>5 No feelings of guilt          6 Mild, slight feelings of guilt          7 Moderate, guilt feelings definitely present, some distress but still manageable          8 Severe, marked feelings of guilt, considerable distress          9 Extreme, pervasive feelings of guilt, self-condemnation regarding survival, incapacitating distress</p> <p>QV (Specify)</p> <hr/>	<p><u>Past week</u></p> <p>F ____</p> <p>I ____</p> <p><u>Past month</u></p> <p>F ____</p> <p>I ____</p> <p>Sx: Y N</p> <p><u>Lifetime</u></p> <p>F ____</p> <p>I ____</p> <p>Sx: Y N</p>
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28. a reduction in awareness of his or her surroundings (e.g., "being in a daze")

<p><u>Frequency</u></p> <p>Have there been times when you felt out of touch with things going on around you, like you were in a daze? What was that like? [DISTINGUISH FROM FLASHBACK EPISODES] How often has that happened in the past month (week)? [IF NOT CLEAR:] (Was it due to an illness or the effects of drugs or alcohol?) When did you first start feeling that way? (After the [EVENT]?)</p> <p>0 Never          1 Once or twice          2 Once or twice a week          3 Several times a week          4 Daily or almost every day</p>	<p><u>Intensity</u></p> <p>How strong was this feeling of being out of touch or in a daze? (Were you confused about where you actually were or what you were doing at the time?) How long did it last? What did you do while this was happening? (Did other people notice your behavior? What did they say?)</p> <p>0 No reduction in awareness          1 Mild, slight reduction in awareness          2 Moderate, definite but transient reduction in awareness, may report feeling "spacy"          3 Severe, marked reduction in awareness, may persist for several hours reaction          4 Extreme, complete loss of awareness of surroundings, may be unresponsive, possible</p>	<p><u>Past week</u></p> <p>F ____</p> <p>I ____</p> <p><u>Past month</u></p> <p>F ____</p> <p>I ____</p> <p>Sx: Y N</p> <p><u>Lifetime</u></p>
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<p><u>Description/Examples</u></p>	<p>amnesia for the episode (blackout)</p> <p>QV (Specify)</p> <p>_____</p> <p>Trauma-related? 1 definite 2 probable 3 unlikely Current _____ Lifetime _____</p>	<p>F ____ I ____ Sx: Y N</p>
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29. derealization

<p><u>Frequency</u></p> <p>Have there been times when things going on around you seemed unreal or very strange and unfamiliar? [IF NO:] (What about times when people you knew suddenly seemed unfamiliar?) What was that like? How often has that happened in the past month (week)? [IF NOT CLEAR:] (Was it due to an illness or the effects of drugs or alcohol?) When did you first start feeling that way? (After the [EVENT]?)</p> <p>0 Never 1 Once or twice 2 Once or twice a week 3 Several times a week 4 Daily or almost every day</p> <p><u>Description/Examples</u></p>	<p><u>Intensity</u></p> <p>How strong was (DEREALIZATION)? How long did it last? What did you do while this was happening? (Did other people notice your behavior? What did they say?)</p> <p>0 No derealization 1 Mild, slight derealization 2 Moderate, definite but transient derealization 3 Severe, considerable derealization, marked confusion about what is real, may persist for several hours 4 Extreme, profound derealization, dramatic loss of sense of reality or familiarity</p> <p>QV (Specify)</p> <p>_____</p> <p>Trauma-related? 1 definite 2 probable 3 unlikely Current _____ Lifetime _____</p>	<p><u>Past week</u></p> <p>F ____ I ____</p> <p><u>Past month</u></p> <p>F ____ I ____ Sx: Y N</p> <p><u>Lifetime</u></p> <p>F ____ I ____ Sx: Y N</p>
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30. depersonalization

<p><u>Frequency</u></p> <p>Have there been times when you felt as if you were outside of your body, watching yourself as if you were another person? [IF NO:] (What about times when your body felt strange or unfamiliar to you, as if it had changed in some way?) What was that like? How often has that happened in the past month (week)? [IF NOT CLEAR:] (Was it due to an illness or the effects of drugs or alcohol?) When did you first start feeling that way? (After the [EVENT]?)</p> <p>0 Never 1 Once or twice 2 Once or twice a week 3 Several times a week</p>	<p><u>Intensity</u></p> <p>How strong was (DEPERSONALIZATION)? How long did it last? What did you do while this was happening? (Did other people notice your behavior? What did they say?)</p> <p>0 No depersonalization 1 Mild, slight depersonalization 2 Moderate, definite but transient depersonalization 3 Severe, considerable depersonalization, marked sense of detachment from self, may persist for several hours 4 Extreme, profound depersonalization, dramatic sense of detachment from self</p>	<p><u>Past week</u></p> <p>F ____ I ____</p> <p><u>Past month</u></p> <p>F ____ I ____ Sx: Y N</p> <p><u>Lifetime</u></p>
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**APPENDIX D**

## D1. CTQ-SF

**INSTRUCTIONS:**

These questions ask about some of your experiences growing up **as a child and a teenager**. For each question, circle the number that best describes how you feel. Although some of these questions are of a personal nature, please try to answer as honestly as you can. Your answers will be kept confidential.

When I was growing up, ...	Never True	Rarely True	Sometimes True	Often True	Very Often True
1. I didn't have enough to eat.	1	2	3	4	5
2. I knew there was someone to take care of me and protect me	1	2	3	4	5
3. People in my family called me things like 'stupid', 'lazy', or 'ugly'.	1	2	3	4	5
4. My parents were too drunk or high to take care of me.	1	2	3	4	5
5. There was someone in my family who helped me feel important or special.	1	2	3	4	5
6. I had to wear dirty clothes.	1	2	3	4	5
7. I felt loved.	1	2	3	4	5
8. I thought that my parents wished I had never been born.	1	2	3	4	5
9. I got hit so hard by someone in my family that I had to see a doctor or go to the hospital.	1	2	3	4	5
10. There was nothing I wanted to change about my family.	1	2	3	4	5
11. People in my family hit me so hard that it left bruises	1	2	3	4	5

or marks.					
12. I was punished with a belt, a board, a cord, or some hard object.	1	2	3	4	5
13. People in my family looked out for each other.	1	2	3	4	5
14. People in my family said hurtful or insulting things to me.	1	2	3	4	5
15. I believe that I was physically abused.	1	2	3	4	5
16. I had the perfect childhood.	1	2	3	4	5

When I was growing up, ...	Never True	Rarely True	Sometimes True	Often True	Very Often True
17. I got hit or beaten so badly that it was noticed by someone like a teacher, neighbour, or doctor.	1	2	3	4	5
18. I felt that someone in my family hated me.	1	2	3	4	5
19. People in my family felt close to each other.	1	2	3	4	5
20. Someone tried to touch me in a sexual way, or tried to make me touch them.	1	2	3	4	5
21. Someone threatened to hurt me or tell lies about me unless I did something sexual with them.	1	2	3	4	5
22. I had the best family in the world.	1	2	3	4	5
23. Someone tried to make me do sexual things or make me watch sexual things.	1	2	3	4	5
24. Someone molested me.	1	2	3	4	5
25. I believe that I was emotionally abused.	1	2	3	4	5

26. There was someone to take me to the doctor if I needed it.	1	2	3	4	5
27. I believe that I was sexually abused	1	2	3	4	5
28. My family was a source of strength and support.	1	2	3	4	5

## D2. CD-RISC

**INSTRUCTIONS:**

Please indicate how much you agree with the following statements as they apply to you over the last **month**. If a particular situation has not occurred recently, answer according to how you think you would have felt.

	Not True At All	Rarely True	Sometimes True	Often True	True Nearly All The Time
1. I am able to adapt when changes occur.	0	1	2	3	4
2. I have at least one close and secure relationship which helps me when I am stressed.	0	1	2	3	4
3. When there are no clear solutions to my problems, sometimes fate or God can help.	0	1	2	3	4
4. I can deal with whatever comes my way.	0	1	2	3	4
5. Past successes give me confidence in dealing with new challenges and difficulties.	0	1	2	3	4
6. I try to see the humorous side of things when I am faced with problems.	0	1	2	3	4
7. Having to cope with stress can make me stronger.	0	1	2	3	4
8. I tend to bounce back after illness, injury, or other hardships.	0	1	2	3	4
9. Good or bad, I believe that most things happen for a reason.	0	1	2	3	4
10. I give my best effort, no matter what the outcome may be.	0	1	2	3	4
11. I believe I can achieve my goals, even if there are	0	1	2	3	4

obstacles.					
12. Even when things look hopeless, I don't give up.	0	1	2	3	4
13. During times of stress / crisis, I know where to turn for help.	0	1	2	3	4

	Not True At All	Rarely True	Sometimes True	Often True	True Nearly All The Time
14. Under pressure, I stay focused and think clearly.	0	1	2	3	4
15. I prefer to take the lead in solving problems, rather than letting others make all the decisions.	0	1	2	3	4
16. I am not easily discouraged by failure.	0	1	2	3	4
17. I think of myself as a strong person when dealing with life's challenges and difficulties.	0	1	2	3	4
18. I can make unpopular or difficult decisions that affect other people, if it is necessary.	0	1	2	3	4
19. I am able to handle unpleasant or painful feelings like sadness, fear and anger.	0	1	2	3	4
20. In dealing with life's problems, sometimes you have to act on a hunch, without knowing why.	0	1	2	3	4
21. I have a strong sense of purpose in life.	0	1	2	3	4
22. I feel in control of my life.	0	1	2	3	4
23. I like challenges.	0	1	2	3	4
24. I work to attain my goals, no matter what roadblocks I encounter along the way.	0	1	2	3	4
25. I take pride in my achievements.	0	1	2	3	4



C3. LSAS

<p>Fear or Anxiety:</p> <p>0 = None</p> <p>1 = Mild</p> <p>2 = Moderate</p> <p>3 = Severe</p>	<p>Avoidance:</p> <p>0 = Never (0%)</p> <p>1 = Occasionally (1-33%)</p> <p>2 = Often (33-67%)</p> <p>3 = Usually (67-100%)</p>
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	Fear or Anxiety	Avoidance
1. Telephoning in public.		
2. Participating in small groups.		
3. Eating in public places.		
4. Drinking with others in public places.		
5. Talking to people in authority.		
6. Acting, performing or giving a talk in front of an audience.		
7. Going to a party.		
8. Working while being observed.		
9. Writing while being observed.		
10. Calling someone you don't know very well.		
11. Talking with people you don't know very well.		
12. Meeting strangers.		
13. Urinating in a public bathroom.		
14. Entering a room when others are already seated.		
15. Being the center of attention.		
16. Speaking up at a meeting.		
17. Taking a test.		
18. Expressing a disagreement or disapproval to people you don't know very well.		
19. Looking at people you don't know very well in the eyes.		
20. Giving a report to a group.		
21. Trying to pick up someone.		

22. Returning goods to a store.		
23. Giving a party.		
24. Resisting a high pressure salesperson.		

E2. Wechsler Memory Scale: Associate Learning; immediate recall

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<u>First Trial</u>		<u>Second Trial</u>		<u>Third Trial</u>	
Metal	- Iron	Rose	- Flower	Baby	-
Cries					
Baby	- Cries	Obey	- Inch	Obey	-
Inch					
Crush	- Dark	North	- South	North	-
South					
North	- South	Cabbage	- Pen	School	-
Grocery					
School	- Grocery	Up	- Down	Rose	-
Flower					
Rose	- Flower	Fruit	- Apple	Cabbage	-
Pen					
Up	- Down	School	- Grocery	Up	-
Down					
Obey	- Inch	Metal	- Iron	Fruit	-
Apple					
Fruit	- Apple	Crush	- Dark	Crush	-
Dark					
Cabbage	- Pen	Baby	- Cries	Metal	-
Iron					

<u>FIRST RECALL</u>		<u>SECOND RECALL</u>		<u>THIRD RECALL</u>	
	<i>Easy Hard</i>		<i>Easy Hard</i>		<i>Easy</i>
	<i>Hard</i>				
North	___	Cabbage	___	Obey	___
Fruit	___	Baby	___	Fruit	___
Obey	___	Metal	___	Baby	___
Rose	___	School	___	Metal	___
Baby	___	Up	___	Crush	___
Up	___	Rose	___	School	___
Cabbage	___	Obey	___	Rose	___
Metal	___	Fruit	___	North	___

School \_\_\_\_\_  
Crush \_\_\_\_\_

Crush \_\_\_\_\_  
North \_\_\_\_\_

Cabbage \_\_\_\_\_  
Up \_\_\_\_\_

**TOTAL** \_\_\_\_\_

**TOTAL** \_\_\_\_\_

**TOTAL** \_\_\_\_\_

Easy: 1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_  
A Total \_\_\_\_\_

Hard: 1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_  
B Total \_\_\_\_\_

Score:  $A/2 + B =$  \_\_\_\_\_

E3. Wechsler Memory Scale: Logical Memory; immediate recall

A: “Anna Thompson / of Bellville / South / who works as a char / in an office (building) /  
reported / at Woodstock / police (station) / that she had been held up / in Long Street /  
the night before / and robbed / of fifteen rand. / She had four / little children, / the rent  
/  
was due, / and they had not eaten / for 2 days. / The police (men) / felt sorry for the  
woman / and collected money / for her. /”

---

B: “Many / school / children / in the northern Transvaal / were killed / or fatally injured /  
and others / seriously hurt / when a bomb / blew up / the school in the town. / The  
children / were thrown / down a hillside / and across / a donga / a long distance / from  
the school. / Only two / children / escaped uninjured. /”

---

E4. Wechsler Memory Scale: Associate Learning; delayed recall

FIRST RECALL

	<i>Easy</i>	<i>Hard</i>	
North	___		South
Fruit	___		Apple
Obey		___	Inch
Rose	___		Flower
Baby	___		Cries
Up	___		Down
Cabbage		___	Pen
Metal	___		Iron
School		___	Grocery
Crush		___	Dark
TOTAL	___	___	
SCORE:		___	
Delayed recall =		___	

E5. Wechsler Memory Scale: Logical Memory; delayed recall

A: “Anna Thompson / of Bellville / South / who works as a char / in an office (building) /  
reported / at Woodstock / police (station) / that she had been held up / in Long Street /  
the night before / and robbed / of fifteen rand. / She had four / little children, / the rent  
/  
was due, / and they had not eaten / for 2 days. / The police (men) / felt sorry for the  
woman / and collected money / for her. /”

---

B: “Many / school / children / in the northern Transvaal / were killed / or fatally injured /  
and others / seriously hurt / when a bomb / blew up / the school in the town. / The  
children / were thrown / down a hillside / and across / a donga / a long distance / from  
the school. / Only two / children / escaped uninjured. /”

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## E6. Stroop task

RED	BLUE	GREEN	RED	BLUE
GREEN	GREEN	RED	BLUE	GREEN
BLUE	RED	BLUE	GREEN	RED
GREEN	BLUE	RED	RED	BLUE
RED	RED	GREEN	BLUE	GREEN
BLUE	GREEN	BLUE	GREEN	RED
RED	BLUE	GREEN	BLUE	GREEN
BLUE	GREEN	RED	GREEN	RED
GREEN	RED	BLUE	RED	BLUE
BLUE	GREEN	GREEN	BLUE	GREEN
GREEN	RED	BLUE	RED	RED
RED	BLUE	RED	GREEN	BLUE
GREEN	RED	BLUE	RED	GREEN
BLUE	BLUE	RED	GREEN	RED
RED	GREEN	GREEN	BLUE	BLUE
BLUE	BLUE	RED	GREEN	RED
RED	GREEN	BLUE	RED	GREEN
GREEN	RED	GREEN	BLUE	BLUE
RED	BLUE	RED	GREEN	RED
GREEN	RED	GREEN	BLUE	GREEN





RED	BLUE	GREEN	RED	BLUE
GREEN	GREEN	RED	BLUE	GREEN
BLUE	RED	BLUE	GREEN	RED
GREEN	BLUE	RED	RED	BLUE
RED	RED	GREEN	BLUE	GREEN
BLUE	GREEN	BLUE	GREEN	RED
RED	BLUE	GREEN	BLUE	GREEN
BLUE	GREEN	RED	GREEN	RED
GREEN	RED	BLUE	RED	BLUE
BLUE	GREEN	GREEN	BLUE	GREEN
GREEN	RED	BLUE	RED	RED
RED	BLUE	RED	GREEN	BLUE
GREEN	RED	BLUE	RED	GREEN
BLUE	BLUE	RED	GREEN	RED
RED	GREEN	GREEN	BLUE	BLUE
BLUE	BLUE	RED	GREEN	RED
RED	GREEN	BLUE	RED	GREEN
GREEN	RED	GREEN	BLUE	BLUE
RED	BLUE	RED	GREEN	RED
GREEN	RED	GREEN	BLUE	GREEN