Investigating pupillometry as a novel mechanism for detecting emotional regulation difficulties in individuals with PTSD

by

Lee Ginton

GNTLEE001

SUBMITTED TO THE UNIVERSITY OF CAPE TOWN

In fulfilment of the requirements for the degree

Master of Medical Science (Neuroscience)

UCT Dept. of Psychiatry

Groote Schuur Hospital (J-2), Anzio Road

Observatory, 7925, Cape Town, South Africa

2017

Supervisor: Professor Dan J. Stein

Co-Supervisor: Dr. Eileen Thomas

Declaration

I, *Lee Ginton*, hereby declare that the work on which this dissertation is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university.

I empower the university to reproduce for the purpose of research either the whole or any portion of the contents in any manner whatsoever.

Signature: signature removed Date: 16 October 2017

Abstract

Objective

Individuals with posttraumatic stress disorder (PTSD) have been found to exhibit emotional regulation difficulties. However, much remains to be learned about the specific neural mechanisms that underlie such difficulties. This study aimed to use eye tracking to investigate the mechanisms underlying emotional regulation difficulties in individuals with PTSD.

Method

A total of 87 trauma-exposed mothers (34 PTSD positive and 53 non-PTSD controls) completed an eye tracking assessment in which pupillary dilation in response to emotionally valenced stimuli was measured. The participants also completed two self-report measures of emotional regulation.

Results

The PTSD group exhibited increased pupillary dilation to positively valenced stimuli compared to the trauma-exposed, non-PTSD group. In contrast, there was no difference between the two groups using self-report measures of emotional regulation. Additionally, there were no associations between self-report measures and pupillary response to emotionally valenced stimuli.

Conclusion

The findings may reflect impaired parasympathetic nervous system processes in individuals with PTSD. The finding that eye tracking, but not emotional regulation questionnaires, differentiated the groups may reflect the point that self-report measures are biased by an individual's ability and willingness to respond. These findings need to be followed up with additional experiments to delineate parasympathetic and other mechanisms involved in underpinning emotional regulation difficulties in PTSD.

Acknowledgments

I would like to first express my greatest appreciation to the entire Drakenstein team and participants. I am forever indebted to my research assistant, Gerdia, and the recruiters, Ncedisa and Candice, for not quitting on me, despite my endless e-mails.

This study would not exist without my supervisors and mentors: Professor Dan Stein, Dr. Eileen Thomas, Dr. Jukka Leppanen, and Dr. Santeri Yrttiaho. You are all brilliant, inspirational leaders. Over the past year, the guidance I received from you all has helped me grow as a researcher and I am sincerely appreciative of that.

Thank you to my partner, Kevin, for believing in me, pushing me forward, and giving me a good reason to be in Cape Town.

Finally, I owe everything to my family around the world. The Ginton's WhatsApp group is the greatest reminder of what a weird, amazing family I have (although I could live without Dad's "jokes"). To my role models, Mark and Reena – you took me in and made my South Africa journey a possibility. From your medical services (whether it be humans or animals) to the humanitarian impact you make in the community, you are both inspirational and I am incredibly fortunate to have you as family. Last but not least, Mom and Dad, you have unconditionally supported this journey and I cannot express how thankful I am for allowing me to have the most fulfilling experience of my life.

Abbreviations

ANS	Autonomic Nervous System
APA	American Psychiatric Association
ASSIST	Alcohol, Smoking and Substance Involvement Screening Test
BDNF	Brain-Derived Neurotrophic Factor
CAPS	Clinician Administered PTSD scale
CSSI	Cambodian Somatic Symptom and Syndrome Inventory
DCHS	Drakenstein Child Health Study
DERS	Difficulties in Emotion Regulation Scale
DoH	Department of Health
DSM	Diagnostic and Statistical Manual of Mental Disorders
EMDR	Eye Movement Desensitization and Reprocessing
ERQ	Emotional Regulation Questionnaire
FMRI	Functional Magnetic Resonance Imaging
HRQOL	Health-Related Quality of Life
IPV	Intimate Partner Violence
IQR	Interquartile Range
MINI	Mini-International Neuropsychiatric Interview
MS	Millisecond
NICE	The National Institute for Health and Care Excellence
PCCR	Pupil Centre Corneal Reflection
PDI	Peri-Traumatic Distress Inventory
PNS	Parasympathetic Nervous System
PTSD	Posttraumatic Stress Disorder
RSA	Respiratory Sinus Arrhythmia
SCR	Skin Conductance Responses

SD	Standard Deviation
SES	Socioeconomic Status
SNRI	Serotonin-Norepinephrine Reuptake Inhibitor
SNS	Sympathetic Nervous System
SSRI	Selective Serotonin Re-Uptake Inhibitor
TF-CBT	Trauma-Focused Cognitive Behavioural Therapy
TCA	Tricyclic Antidepressants
UCT	University of Cape Town
WHO	World Health Organization

Table of Contents

List of Figures

List of Tables

Chapter 1: Literature Review

In this chapter, I draw connections between three constructs: posttraumatic stress disorder (PTSD), emotional regulation, and pupillometry. First, I provide a background to PTSD and discuss why it is important that researchers and clinicians invest resources into improving the understanding of the disorder. Second, I explain what emotional regulation is, how it relates to PTSD, and the current challenges in accurately measuring it. Finally, I discuss how pupillometry works and how it may be utilized to investigate emotional regulation difficulties in individuals with PTSD.

Posttraumatic Stress Disorder (PTSD)

What is PTSD?

PTSD is a mental disorder that may occur following exposure to a traumatic event. PTSD includes a constellation of traumatic stress symptoms, including high levels of arousal, negative changes in mood and cognition, intrusive memories about the event, and behavioural and emotional avoidance (American Psychiatric Association, 2013).

Risk Factors

Researchers have investigated why some individuals who are exposed to trauma develop transient PTSD symptoms, whilst other trauma-exposed individuals develop persisting, chronic symptoms. In a review on PTSD, Yehuda et al. (2002) suggested that there are pre- and post- trauma factors as well as genetic predispositions, that increase an individual's likelihood of developing PTSD.

Pre-Trauma

Pre-trauma risk factors may include socioeconomic status (SES), education, gender, and other demographic variables (Digangi et al., 2013; Guo, He, Qu, Wang, & Liu, 2017). The most consistently reported demographic risk factor for PTSD is female gender (Tolin & Foa, 2006). In their meta-analysis, Tolin and Foa (2006) reported that despite men being at greater risk for experiencing a potentially traumatic event, women are at a greater risk for developing PTSD. The researchers propose as a possible explanatory factor that males experience differing posttraumatic symptoms than those used by the Diagnostic and Statistical Manual (DSM) to define PTSD. For

example, males with trauma exposure are more likely to report behavioural and substance use problems, whereas females are more likely to report cognitive and emotional symptoms (Tolin & Foa, 2006). Until the DSM-5 revised criteria were released, only the latter was congruent with the DSM's PTSD criteria.

Other pre-trauma risk factors repeatedly associated with PTSD include lower SES, lower cognitive abilities, and fewer years of education (Ayazi, Lien, Eide Arne, Ruom, & Hauff, 2012; Dai, 2017; Digangi et al., 2013; Riddle et al., 2007; Zhang & Ho, 2011; Zimmerli et al., 2014).

Post-Trauma

The post-trauma period also plays an important role in determining whether an individual develops PTSD (Greenberg, Brooks, & Dunn, 2015; Trickey, Siddaway, Meiser-Stedman, Serpell, & Field, 2011). A potential explanation is that negative posttraumatic cognitions, or negative perceptions about oneself or the environment, perpetuate the immediate symptoms of trauma (Woodward et al., 2015; Zalta et al., 2014; Zang et al., 2017). For example, receiving social support after a traumatic event may alleviate negative posttraumatic cognitions (Charuvastra & Cloitre, 2008; Guay, Billette, & Marchand, 2006). In research that has examined the pathway of posttraumatic cognitions, PTSD, and social support, the results indicated that social support is negatively correlated with both negative posttraumatic cognition and the development of PTSD (Belsher, Ruzek, Bongar, & Cordova, 2012; Robinaugh et al., 2011; Woodward et al., 2015). These findings support the theory that the post-trauma period influences the development of PTSD by affecting an individual's cognitions related to the traumatic event.

In their meta-analysis, Trickey et al. (2011) reported that other PTSD post-trauma risk factors include poor family functioning, thought suppression, the development of a comorbid psychological problem, and perceived life threat.

Genetic risk factors

Researchers are exploring several potential genetic and epigenetic mechanisms that affect the development of PTSD (Banerjee, Morrison, & Ressler, 2017). These include a serotonin-transporter polymorphism called 5-HTTLPR, the Val88Met SNP in the brain-derived neurotrophic factor (BDNF) gene, and dopaminergic system

genes (Afifi, Asmundson, Taylor, & Jang, 2010; Auxéméry, 2012; Banerjee et al., 2017).

The diathesis-stress hypothesis, or gene-by-environment, is the leading explanation as to why PTSD affects some individuals more than others (Auxéméry, 2012; Chakraborty et al., 2015; Jordan, 2015). The theory states that a person may have a genetic predisposition to a disease, but the environment has protective and risk factors that influence the outcome. Thus, it may be that a combination of pre- and/or post-trauma factors as well as genetics determine whether a person will suffer from PTSD after experiencing a traumatic event.

Symptoms and Diagnostic Criteria

Since 1980, the American Psychiatric Association (APA) has included PTSD as a psychiatric disorder in the DSM. PTSD is unique to other psychiatric disorders in that it requires a precipitating factor, whereas other psychiatric disorders can be diagnosed without an outside stressor. PTSD can affect any individual older than one year of age and symptoms typically present within three months of experiencing the traumatic event. Individuals with PTSD may have differing clinical presentations. Arousal and reactive-externalizing symptoms, dissociative symptoms, negative cognitions, and fear-based re-experiencing are all possible predominate symptom patterns (APA, 2013). Some individuals may experience a combination of these presentations (Friedman, Resick, Bryant, & Brewin, 2011).

To make a formal PTSD diagnosis, a clinician must follow the eight criteria (Criterion A through to Criterion H) listed in the DSM-5 (APA, 2013). The precipitating factor (Criterion A) required to make a PTSD diagnosis includes exposure to death, serious injury, or sexual violence. The most prominent feature of PTSD is intrusive symptoms associated with at least one traumatic event. Intrusive symptoms (Criterion B) often present as “recurrent, involuntary, and intrusive recollections of the event” (APA, 2013). Individuals with PTSD often avoid stimuli that they associate with the event (Criterion C), such as avoiding certain thoughts and memories. Due to inaccurate recollections of the event’s cause, individuals with PTSD may also have negative changes in mood or cognitions associated with the traumatic event (Criterion D). This may include amnesia relating to details of the traumatic event or placing blame on themselves for causing the event. An individual

with PTSD may have changes in arousal and reactivity (Criterion E), such as anger outbursts, aggression, irritability, sleep disturbances, and problems concentrating. To be diagnosed with PTSD, an individual must exhibit Criterion B through to Criterion E for over one month (Criterion F), the symptoms must cause the individual distress or impairment (Criterion G), and the symptoms must not be due to substance use or to a medical condition (Criterion H) (APA, 2013).

Diagnostic difficulties

In this section, I provide examples of how the DSM diagnostic criteria fail to encompass all cases of PTSD. First, I discuss how the DSM does not fully consider symptom expression discrepancies across cultures. Second, I explain that the clinical interview may be biased due to the patient's subjective interpretation of his or her symptoms. Although this study will not directly investigate these diagnostic shortcomings, they are important to discuss as they highlight the need for a better understanding of PTSD's underlying mechanisms. In doing so, more objective and accurate measures of diagnosing PTSD may be established.

Culture

It has been shown that cultural factors play a large role in the PTSD diagnosis, particularly in discrepancies between what constitutes a traumatic event and how the symptoms are experienced (Henry, 2006; Hinton, Kredlow, Pich, Bui, & Hofmann, 2013; Hinton & Lewis-Fernandez, 2010; Kohrt & Hruschka, 2010; Pedersen, Kienzler, & Gamarra, 2010; Sachs, Rosenfeld, Lhewa, Rasmussen, & Keller, 2008; Sprague, Bogart, Manson, Buchwald, & Goldberg, 2010). For example, among a sample of Tibetan refugees, a significant association was discovered between witnessing the destruction of religious symbols and posttraumatic symptoms, whereas there was no significant association between posttraumatic symptoms and torture or imprisonment (Sachs et al., 2008). The DSM criteria of what constitutes a traumatic event (Criterion A) do not include witnessing the destruction of religious symbols as traumatic, but does consider torture and imprisonment as traumatic.

The DSM diagnostic criteria do not adequately account for the fact that there are differences in how posttraumatic symptoms are experienced across cultures. In Cambodian culture, a khyâl attack is the fear "that blood and a wind-like substance

called khyâl surge upward in the body to cause various somatic symptoms and bodily catastrophes" (Hinton, Kredlow, Bui, Pollack, & Hofmann, 2012; Hinton et al., 2013). The Cambodian Somatic Symptom and Syndrome Inventory (CSSI) is a questionnaire that considers culturally sensitive somatic symptoms and syndromes. For example, it lists tinnitus, or ringing in the ears, as a somatic symptom that may occur during a khyâl attack (Hinton et al., 2013). The CSSI allows clinicians to make a culturally relevant PTSD diagnosis that the DSM criteria do not accurately assess.

In their review, Hinton and Lewis-Fernandez (2010) explain that there are differences in PTSD prevalence rates across cultures. For example, the researchers discuss cultural differences that may have affected the PTSD diagnosis in New Yorker Latinos and non-Latino whites affected by the attacks on the World Trade Center in New York City on September 11, 2001. Latino New Yorkers had significantly higher rates of PTSD and trauma-related panic attacks compared to non-Latino white New Yorkers. "Ataque de nervios" is a cultural syndrome in Latino cultures that resemble panic attacks, and they often occur after a traumatic event. An explanation for the difference in diagnostic rates may be that Latinos have "ataques" in order to express their trauma-related distress (Hinton & Lewis-Fernandez, 2010).

A Subjective Interpretation

The DSM diagnostic interview is based on a report that a patient gives to a clinician. This self-report method can be subjective and inaccurate, as an individual may consciously or inadvertently exaggerate or under-report symptoms (Warren, Loper, & Komarovskaya, 2009).

Over-reporting symptoms may occur due to malingering behaviour or in order to receive medical compensation (Constans et al., 2014). According to Resnick et al. (2008), it requires little effort to malinger PTSD. An individual can obtain a list of the PTSD diagnostic criteria prior to the interview and lie to a clinician about his or her symptoms (Warren et al., 2009). In a study consisting of veterans with PTSD, malingering was found to occur in approximately 20% of the sample (Frueh, Hamner, Cahill, Gold, & Hamlin, 2000). This form of misdiagnosis is typically due to an individual's desire to avoid duty, such as a soldier wanting relief from combat (Frueh et al., 2000). Another example of over-reporting symptoms occurred in a court case that covered the aftermath of a large fishing vessel that sunk off the coast

of Alaska (Rosen, 1995). 100% of the victims reported insomnia, nightmares, and flashbacks. Amongst individuals with PTSD, on average only 60% have sleep disturbances, 39% have nightmares, and 45% have flashbacks (Rosen, 1995). It was discovered that the plaintiffs were coached by their attorneys on how to report symptoms (Rosen, 1995; Warren et al., 2009).

Not all individuals who over-report PTSD symptoms are fabricating symptoms for monetary or employment benefits. An individual may exaggerate symptoms as a "cry for help" (Constans et al., 2014). In this form of over-reporting, an individual is experiencing actual psychological or physical distress, but he or she cannot adequately express it (R. E. Brady et al., 2015).

The subjective method by which PTSD is currently diagnosed can also lead to under-reporting of symptoms. Some individuals may under-report in an effort to avoid re-traumatization (Oguntoye & Bursztajn 2009). This typically happens inadvertently, as individuals may have repressed memories related to the traumatic experience. However, individuals may consciously under-report symptoms in attempts to avoid a stigma associated with mental disorders in their community (Webb, Vincent, Jin, & Pollack, 2015).

A PTSD diagnosis is based solely on an individual's interpretation of his or her emotions. In their review, Frueh et al. (2000) suggest that using self-report methods to diagnose PTSD may result in misdiagnoses. Furthermore, it is not feasible for researchers to develop culturally-specific questionnaires, such as the CSSI, for every non-Western culture. These diagnostic shortcomings highlight the need for clinicians to rely less heavily on subjective methodology and to adapt objective, physiological measures of diagnosing PTSD. In order to do so, there needs to be an improved understanding of PTSD's underlying mechanisms.

PTSD Treatment

There are both psychological and pharmacological interventions available for the treatment of PTSD (APA, 2017; The National Institute for Health and Care Excellence (NICE), 2005; World Health Organization (WHO), 2013). Psychological interventions for adults include, but are not limited to, group and individual trauma-focused cognitive behavioural therapy (TF-CBT), eye movement desensitization and reprocessing (EMDR), and stress management (WHO, 2013). Pharmacological

interventions recommended for PTSD treatment include selective serotonin re-uptake inhibitors (SSRIs), serotonin-norepinephrine reuptake inhibitor (SNRI), and tricyclic antidepressants (TCAs).

Psychological Interventions

TF-CBT is the most commonly recommended first-line of psychological therapy for adults with PTSD (APA, 2017). TF-CBT is based on the belief that individuals with PTSD avoid reminders of their traumatic experience because of their negative cognitions associated with the event. By avoiding stimuli related to the traumatic event, the individual continues to perceive a threat. TF-CBT aims to restructure a patient's distressing thoughts related to the trauma. If successful, TF-CBT will change how a patient behaves in response to reminders of the traumatic experience (Bisson, Roberts, Andrew, Cooper, & Lewis, 2013; WHO, 2013).

Both individual and group TF-CBT may decrease PTSD symptom severity (WHO, 2013). Compared to 89% of controlled individuals, only 46.4% of individuals had a PTSD diagnosis at follow-up after individual TF-CBT. Additionally, compared to 66.7% of controlled individuals, only 37.5% of individuals had a PTSD diagnosis at follow-up after group TF-CBT. The evidence for the benefits of group TF-CBT was only based on one trial, thus the confidence in the estimate was low, whereas the estimate for individual TF-CBT was moderate.

EMDR is another form of trauma-focused psychological therapy for the treatment of PTSD (APA, 2017; NICE, 2005; WHO, 2013). EMDR is based on the belief that individuals with PTSD have unprocessed or negative memories about their traumatic experience that result in "negative thoughts, feelings, and behaviours" (WHO, 2013). This form of psychological therapy involves bringing thoughts and sensations related to the traumatic event into consciousness and allowing a clinician to guide the patient's eye movements. Advocates of EMDR argue that eye movement therapy results in reprocessing of the patient's trauma-related memories to become positive memories (Chen, Zhang, Hu, & Liang, 2015). WHO (2013) reported that 48.6% of individuals had a PTSD diagnosis at follow-up after EMDR, compared to 95.1% of controlled individuals at follow-up. The confidence estimate for this report was high (WHO, 2013). Although EMDR has been found to be effective in decreasing symptom severity, the APA does not recommend it if TF-CBT is available (APA,

2017; WHO, 2013).

Compared to TF-CBT and EMDR, stress management is less frequently recommended for the treatment of PTSD, as it does not focus on treating symptoms related to the patient's traumatic experience. Rather, stress management teaches patients behavioural or cognitive techniques that will help them cope with their symptoms. For example, thought stopping and relaxation are used to diminish distressing thoughts related to the traumatic event (Bisson et al., 2013). Compared to 100% of controlled individuals, 61.2% of individuals had a PTSD diagnosis at follow-up after stress management (WHO, 2013). The confidence estimate for these results was low. After considering the benefits, harms, feasibility, confidence estimates, and strength of evidence, WHO (2013) concluded that stress management is less effective than trauma-focused interventions. Stress management is still considered beneficial, as it is the most feasible option for clinicians who are treating patients with PTSD in resource-constrained settings (WHO, 2013).

Pharmacological Interventions

Pharmacological interventions are not recommended as a first-line treatment against PTSD (APA, 2017). Pharmacological interventions should be considered when psychological interventions are unavailable, when a patient is unwilling to have psychological therapy, when psychological therapy is not effective, or when there is comorbid moderate-severe depression (APA, 2017; NICE, 2005; WHO, 2013).

SSRIs and SNRIs are the most commonly recommended pharmacological therapies for individuals with PTSD (APA, 2017). Recommended drug interventions include fluoxetine, paroxetine, sertraline, and venlafaxine (APA, 2017). TCAs may also be used when SSRIs and SNRIs are unavailable or ineffective (APA, 2017; WHO, 2013).

PTSD Prevalence and Burden

In this section, I discuss why it is important to invest resources into improving the understanding of PTSD. I start by discussing the disorder's high prevalence rates locally, across the globe, and in the specific sample of this study. I then explain how affected individuals have impaired functioning across all aspects of daily life and how the financial burden associated with the disorder affects both individuals and

society. I conclude by discussing how offspring whose parents have PTSD are put at mental and emotional risk.

Global prevalence

About 90% of older adults have experienced at least one traumatic event in their life (Ogle, Rubin, Berntsen, & Siegler, 2013). The existing literature suggests that, although the prevalence of PTSD is highest in post-conflict settings, PTSD rates are similar between high- and low-income countries across the globe (Atwoli, Stein, Koenen, & McLaughlin, 2015). About 3.6% of the world's population is affected by PTSD (Koenen et al., 2017). The conditional prevalence of PTSD, the percent of people who have experienced a traumatic event and developed PTSD, is between 3.5-9.2% (Atwoli et al., 2015; N. Breslau, Davis, Andreski, & Peterson, 1991).

Local prevalence

Rates of murder, violence, and sexual assault in South Africa are amongst the highest in the world (CrimeStats, 2015; Crises, 2017; Norman, Matzopoulos, Groenewald, & Bradshaw; Topper, van Rooyen, Grobler, van Rooyen, & Andersson, 2015). National rates of trauma exposure range from 38-75% (Atwoli et al., 2013; Kaminer, Grimsrud, Myer, Stein, & Williams, 2008; Williams et al., 2007). South African youth are at an even higher risk of trauma exposure, with rates reported as high as 83% (Seedat, Nyamai, Njenga, Vythilingum, & Stein, 2004).

The most recent study on national PTSD rates reported a lifetime PTSD prevalence of 2.3% (Atwoli et al., 2013). Higher rates of trauma exposure and PTSD have been reported from community studies in South Africa. A current PTSD prevalence rate of 10.8% was reported in South Africa's Eastern Cape province and a prevalence rate of 19.9% was reported in Khayelitsha, a township in South Africa's Western Cape (Carey, Stein, Zungu-Dirwayi, & Seedat, 2003; Topper et al., 2015). Furthermore, 99.7% of people from Soweto, a township in South Africa's Gauteng province, and 94% of people from Khayelitsha have experienced a potentially traumatic event (Carey et al., 2003; Closson et al., 2016).

Prevalence in Women

Despite men having a higher rate than women of experiencing a traumatic event, women have a significantly higher PTSD prevalence (Javidi & Yadollahie, 2011;

Tolin & Foa, 2006). In a review comprising 25 years of research, Tolin and Foa (2006) found that women are approximately twice as likely as men to meet criteria for PTSD. This was true despite controlling for methodological variables, such as population, type of assessment, and type of study (Tolin & Foa, 2006). Additionally, women are at risk for postpartum PTSD, with prevalence rates ranging from 1-30% (Grekin & O'Hara, 2014). In their meta-analysis, Grekin and O'Hara reported that the prevalence of postpartum PTSD in community samples is approximately 3.1%, and 15.7% in at risk communities.

Economic Burden

PTSD affected individuals have higher levels of employment impairment compared to trauma-exposed individuals without PTSD (Naomi Breslau, Lucia, & Davis, 2004; Schnurr & Lunney, 2012; M. Stein, Walker, Hazen, & Forde, 1997; Westphal et al., 2011). Some of the employment factors associated with PTSD include lower hourly wages, increased likelihood of unemployment, more missed days of work, less work satisfaction, difficulty returning to work after the traumatic experience, and difficulty with work-related demands (Hoge, Terhakopian, Castro, Messer, & Engel, 2007; Kimerling et al., 2009; Matthews, 2005; North et al., 2002; Resnick & Rosenheck, 2008; Savoca & Rosenheck, 2000; Schnurr & Lunney, 2012; Wald, 2009). In addition to these employment difficulties, people with PTSD have amongst the highest rates of healthcare fees (Walker et al., 2003). Prevention, screening, diagnosis, treatment, and rehabilitation are all necessary costs that help give those with PTSD an improved quality of life (Galea et al., 2014). From 2004 to 2012, the cost of treating military service members with PTSD increased from $29.6[1] million to $294.1 million (Galea et al., 2014). This increase was primarily due to a rise in the number of service members diagnosed with PTSD and due to an increase in the cost of treatment (Galea et al., 2014). On average, military service members with PTSD pay over $16,000 more than service members without any mental disorder (Kennell and Associates Inc., 2013). Figure 1 compares the average inflation-adjusted cost of treating a military service member based on their mental disorder status. With such high healthcare costs and occupational impairments, PTSD is one of the greatest burdens to society amongst mental disorders (Davidson, 2001).

[1] Currency has been reported in the United States dollar (USD) throughout this study

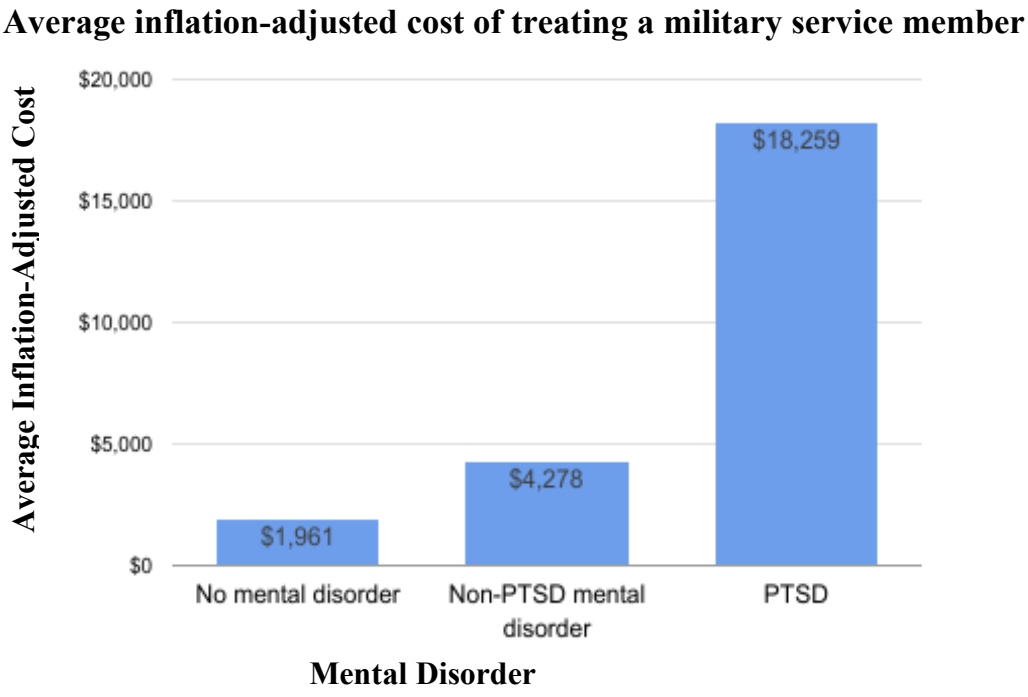


Figure 1 Average inflation-adjusted cost of treating a military service member based on mental disorder status (Adapted from Kennell and Associates Inc., 2013).

Social Burden

Aside from the economic burden, individuals with PTSD also suffer from functional impairments in personal and social life (Mendlowicz & Stein, 2000; Pagotto et al., 2015; M. B. Stein, McQuaid, Pedrelli, Lenox, & McCahill, 2000; Westphal et al., 2011). Increased PTSD severity has been found to be associated with poorer health-related quality of life (HRQOL) (Olatunji, Cisler, & Tolin, 2007; Pagotto et al., 2015; Pupo, Serafim, & de Mello, 2015). This finding holds true even after controlling for other mental comorbidities (Pagotto et al., 2015). Furthermore, compared to individuals with mental disorders such as panic disorder and social phobia, HRQOL is poorer in those with PTSD (Clary, Fayyad, & Endicott, 2005).

Across the various domains of HRQOL, social factors have the greatest impairment in individuals with PTSD (Pagotto et al., 2015). These factors include social functioning, emotional well-being, and energy and fatigue. Criterion D of the DSM-5 includes “feelings of detachment or estrangement from others” as a symptom (APA, 2013). Studies providing evidence for Criterion D found that greater PTSD severity

is associated with greater distancing in social activities and family relationships, and that social support declines over time in individuals with chronic PTSD (Kaniasty & Norris, 2008; Monson, 2012).

Burden on Children

Children of parents with PTSD are particularly affected by the disorder, as they are continuously exposed to their parent's symptoms (i.e., traumatic nightmares, distorted self-blame, exaggerated startle reflex) (Danielson, Hankin, & Badanes, 2015; Yehuda, Bell, Bierer, & Schmeidler, 2008). Mothers with PTSD have been found to have distorted representations of their children's behaviours and personalities (Schechter et al., 2015). This often affects how mothers behave towards their children and how the children perceive themselves (Schechter et al., 2015). For example, 88% of insecurely attached children who have mothers with trauma exposure or PTSD display disorganized attachment, whereas only 33% of insecurely attached children who have mothers without a history of trauma display disorganized attachment (Lyons-Ruth & Block, 1996). Moreover, children whose parents have PTSD are at an increased risk for PTSD and other psychiatric disorders. (Yehuda et al., 2008; Yehuda, Schmeidler, Wainberg, Binder-Brynes, & Duvdevani, 1998). A study by Yehuda et al. (2008) found that children whose mother have PTSD are more vulnerable to PTSD than children whose fathers have PTSD.

PTSD Summary

PTSD is a debilitating mental disorder that may occur after an individual experiences a significant traumatic event. Millions of individuals across the globe are affected by this disorder. PTSD results in a range of socio-occupational dysfunction and impairment. Women and children of parents with PTSD are particularly affected by the disorder. It is thus of importance that researchers improve their understanding of the mechanisms behind PTSD, so that more effective methods by which to diagnose and treat the disorder can be investigated. Furthermore, it is of importance to include women, in particularly mothers, in studies on PTSD.

Emotional Regulation

In this section, I discuss why emotional regulation should be investigated in order to improve the understanding of PTSD. First, I explain how several PTSD symptoms

reflect emotional regulation difficulties. Second, I discuss research that investigates how emotional regulation may mediate substance abuse in individuals with PTSD. Finally, I discuss studies that reveal neural anatomy discrepancies between individuals with and without PTSD when performing an emotional regulation task.

What is Emotional Regulation?

Emotion regulation is a multi-faceted psychological construct that involves (1) an awareness, understanding, and acceptance of emotions; (2) an ability to control impulsive behaviours when experiencing emotional distress; and (3) the availability of adaptive strategies for modulating the duration and/or intensity of negative emotional experiences in accordance with individual goals and situational demands (Gratz & Roemer, 2008). Factors involved in emotional regulation include up-regulation (enhance), down-regulation (suppress), or maintaining of an emotional state (Xiong et al., 2013).

An individual's capacity to regulate emotion and emotion-related behaviours (e.g., anger) are key aspects of adaptive social functioning. Emotional regulation abilities are important in social interactions and in maintaining mental and physical health (Kim & Hamann, 2007). In order to adapt to adverse situations, individuals need to be able to enhance positive aspects and suppress negative aspects of a distressing situation (Gross, 1998; Kim & Hamann, 2007).

Emotional Regulation and PTSD

PTSD symptoms that highlight emotional regulation difficulties

Several studies have suggested that there is an association between PTSD symptoms and impaired emotion regulation abilities (Powers, Etkin, Gyurak, Bradley, & Jovanovic, 2015; Seligowski, Lee, Bardeen, & Orcutt, 2015; Shepherd & Wild, 2014; Weiss et al., 2012). Several PTSD symptoms may be explained by difficulties in emotional regulation, such as persistent negative emotions, irritable behaviours, anger outbursts, and avoidance of emotional stimuli that remind the individual of the traumatic event (APA, 2013). Sippel et al. (2016) measured emotional regulation difficulties in a sample of both trauma-exposed veterans with and without PTSD as well as healthy civilian controls. The researchers found that, compared to trauma-exposed individuals without PTSD, individuals with PTSD have greater emotional

regulation difficulties. Sippel et al. (2016) did not find a difference in emotional regulation difficulties between healthy civilians and trauma-exposed, non-PTSD veterans. These findings support the notion that emotional regulation difficulties are distinct to individuals with PTSD, as opposed to those with trauma exposure (Klemanski, Mennin, Borelli, Morrissey, & Aikins, 2012; Sippel, Roy, Southwick, & Fichtenholtz, 2016; Weiss et al., 2012).

Emotional regulation as a mediator of substance abuse in individuals with PTSD

Emotional regulation may also mediate elevated substance abuse rates in individuals with PTSD (K. T. Brady, Back, & Coffey, 2004; Goldstein, Bradley, Ressler, & Powers, 2017; Tull et al., 2016). The self-medication hypothesis is a commonly accepted theory which suggests that individuals with PTSD resort to substance use as a means by which to suppress memories/emotions related to the traumatic event and to avoid experiencing PTSD symptoms (K. T. Brady et al., 2004; Goldstein et al., 2017; Radomski & Read, 2016). Emotional regulation has been found to mediate alcohol dependence in individuals with PTSD, but not in healthy individuals or those with only trauma exposure (Goldstein et al., 2017; Radomski & Read, 2016). Based on this finding, Radomski and Read (2016) provide further support for the notion that emotional regulation difficulties are specific to individuals with PTSD and not to trauma-exposed individuals without PTSD.

Neural Anatomy as an indicator of the relationship between emotional regulation and PTSD

Functional magnetic resonance imaging (fMRI) has been used to investigate the neural anatomy linked to emotional regulation difficulties in individuals with PTSD (Liberzon & Sripada, 2007; Xiong et al., 2013). In a study by Xiong et al. (2013), participants were given an emotional regulation task while the researchers monitored brain region activation. Participants were instructed to enhance, diminish, or maintain their emotional responses to neutral and negative stimuli. Compared to healthy controls, participants with PTSD showed decreased activation in the anterior cingulate cortex, middle cingulate cortex, left inferior frontal cortex, left putamen, and bilateral inferior parietal lobule, and increased activation in the amygdala and posterior cingulate cortex. Additionally, compared to the healthy controls, the participants with PTSD had decreased activation in the inferior frontal cortex, left

putamen, bilateral inferior parietal lobule, and insula when instructed to diminish their emotional responses to negative stimuli. The results by Xiong et al. (2013) are consistent with other findings that show that emotional regulation decreases activation in emotional processing brain regions, such as the amygdala, and that emotional regulation increases activation in the prefrontal cortex (Fitzgerald et al., 2017). These findings suggest that individuals with PTSD have impaired neural functioning that impacts their ability to adequately regulate their emotions (Xiong et al., 2013).

Measuring Emotional Regulation in Individuals with PTSD

There are a number of ways that researchers have measured emotional regulation difficulties in individuals with PTSD. In this section, I discuss why researchers should look towards adapting physiological measures of emotional regulation, which may be less inaccurate and subjective than self-report measures. I discuss research that has begun to search for an objective measure of emotional regulation difficulties in patients diagnosed with PTSD. These studies indicate that physiological responses, specifically the parasympathetic nervous system (PNS), may be used to measure emotional regulation in individuals with PTSD.

Self-report measures of emotional regulation

The majority of available studies that have assessed emotional regulation have only employed self-report measures (Bonn-Miller, Vujanovic, Boden, & Gross, 2011; Cloitre, Miranda, Stovall-Mcclough, & Han, 2005; Ehring & Quack, 2010; Kashdan, Uswatte, Steger, & Julian, 2006; Vujanovic, Bonn-Miller, Potter, Marshall, & Zvolensky, 2011). Common emotional regulation self-report questionnaires ask the respondent to rate how much he or she is in concordance with an emotional situation (Gratz & Roemer, 2008; Gross & John, 2003). For example, the Emotional Regulation Questionnaire (ERQ) has participants rate on a scale of 1-7 (1= “strongly disagree”, 7= “strongly agree”) how they control their emotions internally and externally (Gross & John, 2003). One question on the ERQ asks participants, “When I want to feel more *positive* emotion (such as joy or amusement), I *change what I’m thinking about*” (Gross & John, 2003). Lower scores indicate greater emotional regulation difficulties.

Self-report measures are dependent on individuals' self-awareness, their ability to ignore social biases, and on the instructions and wording of questions (Choi & Pak, 2004; Mauss & Robinson, 2009). Participants may inaccurately report results due to "social desirability bias", the tendency to report results based on what they believe is culturally and socially acceptable (Logan, Claar, & Scharff, 2008; Paulhus & Reid, 1991). Some participants may have such strong social desirability that they suppress negative thoughts and feelings about themselves (Logan et al., 2008; Paulhus & Reid, 1991). Furthermore, there are aspects of emotional regulation that are implicit, and thus the participant may be unaware that certain dysregulatory processes are occurring (Powers et al., 2015). The trauma model of dissociation holds that individuals with trauma exposure may be at an increased risk for dissociation, denial, and avoidance of their emotional processes (Kamen, Bergstrom, Koopman, Lee, & Gore-Felton, 2012; Kulkarni, Porter, & Rauch, 2012; Lev-Wiesel & Zohar, 2014; Nijenhuis & Van Der Hart, 2011; D. J. Stein et al., 2012). Based on this notion, self-report measures may be particularly inaccurate when completed by individuals with PTSD.

Self-report results may be biased by an individual's ability and willingness to report on emotional responses. There is a need for greater use of objective measures of emotional regulation, such as laboratory-based physiological measures.

Objective measures of emotional regulation

Compared to self-report measures, objective measures are less often used when assessing emotional regulation difficulties in individuals with PTSD. A study by Shepherd and Wild (2014) assessed skin conductance responses (SCR) as a physiological measure of emotional regulation in PTSD and trauma-exposed individuals. The researchers conducted a computerized task that instructed participants to regulate their emotional responses to negative stimuli. The results showed an association between PTSD and SCR, but not self-report measures, when participants enhanced their negative emotions. Furthermore, when analysing self-report measures and SCR together, there was no association found between PTSD symptom severity and difficulties maintaining or decreasing negative emotions. According to Shepherd and Wild (2014), these results support the notion that there is not always consistency in reported emotional regulation abilities when using self-

report measures.

Another objective measure of emotional regulation in individuals of PTSD is a computerized behavioural assessment, called the emotional conflict task (Powers et al., 2015). The task required participants to identify a facial expression, such as happy or fearful, while ignoring an overlying emotion word that may not correspond with the facial expression. For example, an image of a happy facial expression may have had the word "FEAR" written across it, and the individual would have had to identify that the facial expression depicted a happy emotion. Using a sample of individuals with moderate-severe exposure to childhood abuse, Powers et al. (2015) found an association between PTSD symptom severity and poor task accuracy.

Researchers have explored PNS processes as a physiological measure of emotional regulation difficulties (Katz & Gurtovenko, 2015; Laborde, Mosley, & Thayer, 2017; Stange, Hamilton, Fresco, & Alloy, 2017). The PNS is a division of the autonomic nervous system (ANS), which controls an individual's response to environmental demands (Canero & Hermitte, 2014). The primarily role of the PNS is to return the body to homeostasis after the body has initiated a "fight or flight" response (Canero & Hermitte, 2014). For example, an individual's heart rate will increase in a fearful situation. The PNS will lower the individual's heart rate when the individual has escaped from the situation. The most common method of measuring PNS processes uses respiratory sinus arrhythmia (RSA), an index of cardiac vagal control (Beauchaine, 2015). RSA reflects variability in heart rate as a result of the PNS slowing down respiration in non-distressing situations (Stange et al., 2017). In a distressing situation, the PNS does not suppress one's heart rate so that an individual can quickly react. This causes heart rate to increase and RSA to decrease. A meta-analysis examining studies that investigated the association between RSA and emotional regulation concluded that individuals with low baseline RSA have impaired PNS-functioning and have difficulties regulating their emotions (Graziano & Derefinko, 2013). These studies offer a greater understanding of the mechanisms behind emotional regulation – they suggest that the PNS plays a large role in controlling one's emotional regulation abilities.

Although the computerized tasks and RSA measurement are good steps towards finding an objective measure of emotional regulation in individuals with PTSD, they have several limitations. For example, electrodes are often used when measuring

RSA, which may be intrusive and difficult to administer (Hopper, Spinazzola, Simpson, & van Der Kolk, 2006). Furthermore, computerized behavioural assessments often require literacy, and are therefore ineligible for young children and low educated individuals (Powers et al., 2015). Researchers are beginning to investigate pupil dilation as a physiological index of emotional regulation that measures PNS processes (N. Cohen, Moyal, & Henik, 2015). Before discussing whether pupillary response can be utilized to assess emotional regulation, it is important to first explain the foundation of pupillometry.

Pupillometry

In the following section, I discuss why pupil dilation may be the most effective and efficient objective indicator of emotional regulation difficulties in individuals with PTSD. I provide a background of pupillometry, how pupillometry allows PNS processes to be observed, and how pupillometry can easily be measured using eye tracking technology. I conclude by bringing together the three factors discussed in this chapter: PTSD, emotional regulation, and pupillometry.

Pupillometric Processes

Pupillometry is the study of changes in pupil diameter (Sirois & Brisson, 2014). Pupillometry allows continuous measurement of involuntary physiological responses to visual stimuli (Granholm & Steinhauer, 2004). The average pupil is approximately 3 mm at standard light, and its size can vary between 1.5 to 9 mm. Although the pupil contracts and dilates in response to changes in light, pupil size also changes in response to emotional and mental functioning. Pupil size is controlled by the ANS, which consists of the PNS and the sympathetic nervous system (SNS). The ANS controls two iris muscles that either dilate or contract the pupil. The PNS controls pupillary constriction and the SNS controls pupillary dilation (Wang et al., 2016). Pupillary response to a stimulus often consists of two consecutive phases (Yrttiaho, Niehaus, Thomas, & Leppänen, 2017). First, it takes about 600-1600 ms for the pupil to constrict. Then, over the course of several seconds, the pupil dilates back to baseline (Yrttiaho et al., 2017).

Aside from adjusting in response to brightness, the degree to which the pupil dilates is dependent on how an individual emotionally processes a stimulus. Pupillometry

has been used to investigate the effects of emotionally valenced stimuli on pupil size (Kinner et al., 2017). Specifically, pupil dilation has been found to increase when participants are presented with emotionally valenced stimuli (Bradley, Miccoli, Escrig, & Lang, 2008; Henderson, Bradley, & Lang, 2014; Prehn et al., 2013; Sepeta et al., 2012; Yrttiaho et al., 2017). An explanation for the increase in pupil size when viewing emotionally valenced stimuli is that the PNS is inhibited in a distressing or arousing situation. When the PNS is inhibited, the pupil is not contracted and pupil size increases. (Kinner et al., 2017).

Measuring pupillometry: eye tracking

Pupillometry is measured using eye tracking technology. Eye tracking allows objective and accurate measurement of physiological arousal to both emotional and non-emotional stimuli (Bremner, 2009). Pupillary response cannot be controlled voluntarily, making eye tracking a reliable and objective tool. Unlike other tools used to assess emotional functioning, such as SCR and RSA, eye tracking is relatively inexpensive and non-invasive (Wilhelm & Wilhelm, 2003). In addition, as eye tracking does not require advanced language or motor responses, it is a suitable methodology for examination of people with language or physical barriers (Tager-Flusberg & Kasari, 2013).

Stimulus for eye tracking

Showing participants images of facial expressions is a common method used for emotionally valenced stimuli in eye tracking studies (Prehn et al., 2013; Sepeta et al., 2012; Yrttiaho et al., 2017). Pictorial images should be used, as they are natural and realistic emotional stimuli (Armstrong, Bilsky, Zhao, & Olatunji, 2013). Lexical images are not reliable emotionally valenced stimuli, as they have low salience and may not be emotionally threatening or arousing (Armstrong et al., 2013; Cascardi, Armstrong, Chung, & Pare, 2015). Some pictorial images can be too difficult to process. Thus, using facial expressions as emotional stimuli provide an ideal balance between lexical and pictorial images (Armstrong et al., 2013).

The Association Between Pupillometry, Emotional Regulation, and PTSD

Pupillometry and PTSD

Pupillometry may be used to investigate how individuals with a poorly functioning PNS, such as individuals with PTSD, react to emotionally valenced stimuli. However, the pupillary response to emotionally valenced stimuli in individuals with PTSD has not been extensively investigated (Cascardi et al., 2015; Felmingham, Rennie, Manor, & Bryant, 2011). Of the three available studies, two found a correlation between PTSD status and increased pupil size to emotional stimuli (Cascardi et al., 2015; Kimble, Fleming, Bandy, Kim, & Zambetti, 2010). A study by Cascardi et al. (2015) had the largest sample size (N=40) and found that compared to trauma-exposed individuals without PTSD, those with PTSD had larger pupillary dilation in response to threatening stimuli. Similarly, Kimble et al. (2010) found that PTSD symptom severity correlated with increased pupil dilatation to threatening stimuli. Contrary to these two studies, a study by Felmingham et al. (2011) did not find a significant difference in pupil size in response to emotionally valenced stimuli between individuals with PTSD and those with only trauma exposure. Unlike the other two studies, Felmingham et al. (2011) used lexical stimuli, rather than pictorial images, which are believed to have low salience, and thus are not valid tools for emotionally valenced stimuli (Cascardi et al., 2015; Kimble et al., 2010).

There are no studies on PTSD and pupil dilation that have discussed mechanisms that may explain the increase in pupil size. Investigating pupillary response variation may help clinicians improve their understanding of PTSD and help bring forth improved objective diagnostic tools.

Pupillometry and emotional regulation

As previously discussed, studies on RSA have suggested that PNS impairment is associated with emotional regulation difficulties. However, there are few studies that investigate emotional regulation difficulties using pupillometry, rather than RSA, as an index of the PNS response (N. Cohen et al., 2015). A study by Cohen et al. (2015) measured pupil dilation in response to emotionally valenced stimuli in 23 healthy participants. The researchers showed that pupil size was larger when participants were presented with negatively valenced stimuli compared to neutral stimuli. They

concluded that novel interventions can arise for individuals affected by emotional dysregulation psychopathologies through the study of pupil dilation (N. Cohen et al., 2015).

Isaacowitz et al. (2015) also used eye tracking to study emotional regulation. The group only focused on attentional deployment, which is the amount of time an individual directs his or her attention towards or away from an emotionally valenced stimulus. Thus, the researchers measured the location of the participants' eye gaze rather than the participants' pupil dilation (Isaacowitz, Livingstone, Harris, & Marcotte, 2015). According to Kinner et al. (2017), pupil size is a more accurate measure of emotional regulation than eye gaze because pupil size is controlled by the ANS.

A study by Kinner et al. (2017) investigated the effectiveness of using pupillometry to measure emotional regulation abilities by comparing it to SCR and self-report ratings. Participants were instructed to up-regulate, down-regulate, or maintain their response towards an upcoming negatively valenced image. For example, if a participant was told to down-regulate an image's negative scenario, then the situation had to be given a positive spin. Responses were measured in three ways: (1) using eye tracking to measure pupillary response, (2) having the participants rate their emotional experience (on a 9-point scale from unpleasant to pleasant), and 3) sampling SCR using electrodes attached to the participants' hands. The results were consistent with related studies that have shown an increase in pupil size when individuals are presented with emotionally valenced stimuli (Kinner et al., 2017). More novel was that Kinner et al. (2017) found pupil dilation to be the most effective and efficient measurement of emotional regulation. Unlike pupil size, SCR was not affected by the emotional regulation tasks. The researchers note this to be congruent with previous studies that have reported that there is no effect of emotional regulation on SCR. In addition, whereas pupil reactivity was involuntary, the self-report ratings were subjective and thus, not a reliable method (Kinner et al., 2017).

Eye tracking, emotional regulation and PTSD

According to Cohen et al. (2015), pupillometry can be a "highly valuable tool in the understanding of psychological disorders." However, no studies currently exist that utilize eye tracking to examine the relationship between emotional regulation and

PTSD. Eye tracking may help determine whether there is a difference in the processing of emotional stimuli between individuals with PTSD and those with only trauma exposure. This is an important question to be answered given that examining emotional regulation using a physiological measure may assist in providing a more accurate assessment of PTSD's underlying mechanisms. Furthermore, incorporating both behavioural and self-report measures in the same study may help determine the most effective method for differentiating between individuals with PTSD and trauma-exposed individuals without PTSD.

Chapter 2: Aims and Objective

Purpose of study:

The primary objective of this study is to investigate whether pupillometry can be used to improve the understanding of the mechanisms behind PTSD. This study will employ eye tracking technology in order to determine whether individuals with PTSD differ in their response to emotionally valenced stimuli compared to trauma-exposed individuals without PTSD. Eye tracking assessments, emotional regulation questionnaires, and structured clinical interviews will be administered to participants from a community birth cohort study to assess the following hypotheses:

Hypotheses:

1. Compared to trauma-exposed, non-PTSD controls, mothers with current or lifetime PTSD will exhibit greater scores of emotional regulation difficulties on self-report measures.

2. Compared to trauma-exposed, non-PTSD controls, mothers with current or lifetime PTSD will exhibit larger pupillary diameter in response to positively and negatively valenced stimuli.

3. Participants with greater scores of emotional regulation difficulties on self-report measures will exhibit larger pupillary diameter in response to positively and negatively valenced stimuli.

Chapter 3: Methods

Study Design

This was a nested case control study of the ongoing Drakenstein Child Health Study (DCHS), a population based birth cohort study in the Drakenstein area, a low socio-economic, semi-urban area in the Cape Winelands, Cape Town, South Africa. Pregnant women were enrolled in their second trimester and followed through childbirth; thereafter mother-child pairs will be followed until the children are 5 years of age (Zar, Barnett, Myer, Stein, & Nicol, 2015). Maternal and child health were investigated through longitudinal assessment of a range of clinical, environmental, genetic, nutritional, immunological, and psychosocial risk factors (Stein et al., 2015).

Mothers in the parent-study were originally recruited at 20-28 weeks' gestation from two primary care clinics - TC Newman and Mbekweni - in the Drakenstein sub-district between April 2012 and September 2015. TC Newman serves a predominantly mixed-race community, while Mbekweni serves primarily a Black African community. The Drakenstein sub-district has been selected for its accessibility, population (of stable, but low SES), high trauma burden, and cost-free public health system.

Recruitment and Enrolment

100 mothers were enrolled for this sub-study. Participants were assigned to either a clinical group (those who reported trauma exposure and were diagnosed with either a lifetime or current PTSD diagnoses) or a control group (mothers who reported trauma exposure, but did not receive a clinical PTSD diagnoses). This sample size was selected based on sample sizes in existing related literature (Cascardi et al., 2015; Felmingham et al., 2011; Henckens, Hermans, Pu, Joëls, & Fernández, 2009). Cases were identified based on maternal reports of trauma exposure and PTSD diagnostic assessments conducted antenatally (20-28 weeks) and during the post-partum period (time-points: 10 weeks, 6 months, 12 months, 18 months, 24 months, and 36 months) using validated psychometric measures.

Inclusion criteria for the present sub-study included (a) mothers aged older than 18 years and (b) completion of psychometric measures of PTSD and trauma exposure

during the study period (i.e., during the perinatal period until offspring three years of age). Exclusion criteria included (a) head injury or neurological disorder, (b) current psychotic disorder, and (c) history of substance abuse (lasting longer than one year).

Research procedures and data collection methods

In a single session, participants completed an eye tracking assessment, a series of questions via completion of self-report measures, and a structured clinical interview. Each session started with a briefing and consent period in which the participants were informed of the day's schedule and told that they were allowed to refuse participation without any consequences.

(1) Eye tracking

Procedure:

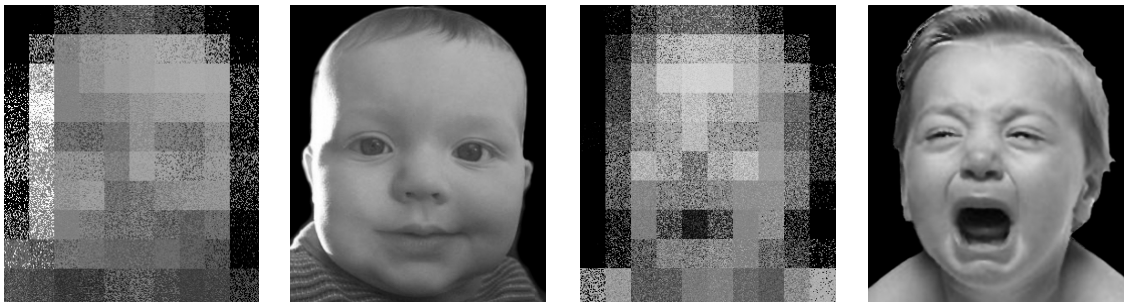
A participant was brought into a dimly lit, sound-proof room and sat in front of a Tobii eye tracking system. To calibrate the eye tracker, the participant's seated height and distance from the eye tracker was adjusted and the participant was told to fixate on targets that appeared in various spots across the monitor. The participant was then presented with three experimental blocks, each consisting of eight different images of infant faces. The images appeared in randomized order and were either positively or negatively valenced. A scrambled, non-face pattern preceded each stimulus. Preceding the second and third blocks, the participants were given a break from viewing infant faces. During the break, positive music and images (i.e., an ocean scene) appeared for 10 seconds and eye tracking data was not recorded.

The assessment was broken down into four different parts: (1) a foreperiod with a black screen for 1000 ms; (2) a pre-stimulus period with randomized face pixels for 2000 ms; (3) stimulus onset, in which positively or negatively valenced images appeared for 4000 ms; (4) an ending indicator, in which a white rectangular border appeared over the stimulus for 1000 ms. Additionally, before the emotionally valenced image appeared, there was a signalling sound for 2500 ms. The eye tracking test took approximately 10 minutes to complete.

Stimuli:

The images of infant's faces displayed front views of infants with positive (smiling) and negative (crying) facial expressions. This method of using images of facial expressions depicting various emotions is frequently used in eye tracking assessments of emotional responsiveness (Priebe, Messingschlager, & Lautenbacher, 2015; Proverbio, Matarazzo, Brignone, Zotto, & Zani, 2007). The images have been tested for validity and were selected based on similar face-background ratio, infants' head orientation, and infants' age (Yrttiaho et al., 2017). In a previous study, the stimuli used was rated for emotional intensity (Yrttiaho et al., 2017). Participants were asked to rate the emotional valence of each facial expression as either 1 (positive, happy), 2 (neutral), or 3 (negative, sad). The positive stimuli used in the present study received a mean score of 1.8 (SD = 0.1), and the negative stimuli received a mean score of >2.9 (SD < 0.2) (Yrttiaho et al., 2017).

A non-face pattern with matching grayscale intensity to the upcoming infant image was also adapted. This pattern consisted of scrambled face pixels and was presented before each facial stimulus in order to control for luminance-related variability in pupil size across trials (Yrttiaho et al., 2017). Figure 2 presents examples of the positively and negatively valenced stimuli and their corresponding pre-stimuli.



Scrambled face pixels | Positively valenced stimulus | Scrambled face pixels | Negatively valenced stimulus

Figure 2 Images of infant facial expressions depicting positive and negative emotions.

Analysis of pupillary response:

The eye tracking assessment and pupillary analysis was obtained from DCHS collaborators who have used the assessment in a related eye tracking study (Yrttiaho et al., 2017). The assessment was written using MATLAB scripts, the Talk2Tobii toolbox, and Psychtoolbox. The Tobii eye tracking system was based on Pupil Centre Corneal Reflection (PCCR), that is, near infrared illumination and its reflections from the cornea relative to the centre of the pupil. The light reflections were captured by two cameras. A general 3D model of the eye and the angles, distances, and other geometrical features of the reflections were used to calculate the position of the pupils and the direction of gaze. Pupil size from each eye was recorded from the pre-stimulus period throughout stimulus onset.

GazeAnalysisLib was used to process the eye tracker's output (Yrttiaho et al., 2017). The eye tracker reported raw data, consisting of a timestamp, X-Y coordinates of the two eyes, and pupil diameter of the two eyes (in mm) at a sampling frequency of 60 samples/second. Pupil dilation was used as an indicator of emotional regulation. Pupil dilation was found to occur between 3000-4000 ms. Therefore, the time window for extracting pupil size was placed at this interval. For each block, the mean pupil size during this time window was calculated and reported as the pupillary response to the emotionally valenced stimuli. The mean pupil size was baseline-corrected by subtracting the mean pupil diameter during the pre-stimulus interval from the mean pupil size during the 3000-4000 ms response time window. Therefore, if the pupil had constricted from baseline, then pupil size received a negative value. Each individual data set underwent quality control. Criteria for quality control included (a) that the participant maintained focus on the stimulus display, (b) that there were no errors during the trial, and (c) that there were no outliers.

(2) Emotional regulation questionnaires

The *Difficulties in emotion regulation scale (DERS; see Appendix A)* is a 36-item self-report measure that assesses an individual's typical levels of emotion dysregulation across six domains: (1) non-acceptance of emotional responses, (2) difficulties pursuing goal-directed behaviours when experiencing negative emotions, (3) difficulties controlling impulsive behaviours when experiencing negative emotions, (4) lack of emotional awareness, (5) limited access to emotion regulation

strategies, and (6) lack of emotional clarity (Gratz & Roemer, 2008). Higher values indicate greater difficulties in emotion regulation. The DERS has been found to demonstrate good reliability (Cronbach's α=0.93; test-retest reliability over a period ranging from four to eight weeks = 0.88) and adequate construct and predictive validity (Gratz & Roemer, 2008). For the present study, we used the overall measure of emotional dysregulation symptoms as well as scores of the individual six domains of emotional dysregulation.

The *Emotion Regulation Questionnaire (ERQ; see Appendix B)* is a 10-item scale that can be scored on a 7-point Likert scale: endpoints 1 ("strongly disagree") to 7 ("strongly agree") (Gross & John, 2003). The ERQ was developed by Gross and John (2003) to measure two specific constructs related to emotion control: cognitive reappraisal and expressive suppression. Cognitive reappraisal assesses how a respondent positively regulates emotions to reduce psychological impact of the current situation. The scale consists of six items (1, 3, 5, 7, 8, 10). Emotion suppression examines how the respondent consciously hides/conceals uncomfortable feelings and/or thoughts in an adaptable way. The scale consists of four items (2, 4, 6, 9). The test-retest reliability was 0.69, with internal consistency for cognitive reappraisal (α=0.79) and emotion suppression (α=0.73) (Gross & John, 2003).

(3) Trauma exposure, PTSD, and comorbid mental disorders

For this study, trauma exposure was defined as a traumatic event(s) where the individual is confronted with actual or threatened death, serious injury or sexual violation, or exposure to the death, injury, or suffering of others per DSM-IV-TR criteria. Potential trauma and PTSD symptoms were assessed using various psychometric measures:

The *Intimate Partner Violence (IPV; see Appendix C) questionnaire* was adapted for this study from the WHO multi-country study and the Women's Health Study from Zimbabwe (Krug, Dahlberg, Mercy, Zwi, & Lozano, 2002; Shamu, Abrahams, Temmerman, Musekiwa, & Zarowsky, 2011). The IPV questionnaire assessed lifetime and recent emotional, physical, and sexual abuse by one's intimate partner. For each type of abuse, a 4-point frequency scale was used ("never", "once", "few times", and "many times"). A detailed description of the IPV questionnaire was previously published (Koen et al., 2014). Participants were considered to be trauma-

exposed if they had any history of IPV (i.e., they did not report "never" in all responses).

The *Peri-traumatic distress inventory (PDI; see Appendix D)* is a 13-item self-report measure that provides a quantifiable measure of level of distress experienced during and immediately after a traumatic event (Brunet, Weiss, Metzler, & Best, 2001). Each item assessed symptoms of distress related to the event, scored between 0 ("not at all") and 4 ("extremely"). A total score was obtained by calculating the mean response across all 13 items, with higher scores indicating greater distress related to the event. This measure was only completed by participants who reported experiencing a life-threatening trauma.

The Clinician Administered PTSD scale (CAPS) is a clinician evaluation of the participants' current and lifetime PTSD using criteria from the DSM-IV (APA, 2000). The CAPS is the most widely used structured interview for diagnosing PTSD and has excellent test-retest reliability (r=0.92-0.99) and internal consistency (alpha=0.80-0.90) (APA, 2017; Weathers, Keane, & Davidson, 2001). The CAPS is administered to participants who scored above threshold for PTSD on the MINI in order to confirm the diagnosis.

The *Mini-International Neuropsychiatric Interview (MINI; see Appendix E)* was administered by a psychiatrist or clinical psychologist in order to diagnose PTSD (lifetime and current) and comorbid disorders based on DSM-IV-TR, and to exclude current substance use or psychotic disorders (Sheehan et al., 1998). The MINI was administered antenatally (28-32 weeks), age six to 10 weeks, six months, and 18 months. The MINI was administered again on the same day as the eye tracking assessment. The participants were placed in the PTSD group if they were diagnosed with lifetime or current PTSD using the MINI and CAPS at any time point.

The *Alcohol, Smoking and Substance Involvement Screening Test (ASSIST; see Appendix F)* is a self-report tool developed by the WHO to detect substance use among people attending primary health care services (WHO, 2002). The ASSIST assessed substance use and substance-related risk across 10 categories (tobacco, alcohol, cannabis, cocaine, amphetamine-type stimulants, inhalants, sedatives/sleeping pills, hallucinogens, opioids, and other substances). Total scores were obtained for each substance by summing individual item responses, with higher

scores indicating greater risk for substance-related health problems (WHO, 2002). The ASSIST has been validated in a South African context (Cronbach's α ranged from 0.81-0.96 for alcohol and illicit drugs) (Westhuizen, Wyatt, Williams, Stein, & Sorsdahl, 2016). The ASSIST was completed antenatally (28-32 weeks), at infant age six weeks, and six, 12, 18, 24, 36, 48 and 60 months. Participants with a history of substance abuse that lasted longer than one year were excluded from the study.

Ethical Statement

This study was granted approval by the Human Research Ethics Committee of the Faculty of Health Sciences, University of Cape Town (UCT) (HREC REF: 689/2016; see Appendix G). The DCHS has also been approved by the Human Research Ethics Committees of the Faculties of Health Sciences, UCT (HREC REF: 401/2009) and Stellenbosch University in South Africa as well as by the Western Cape Department of Health (DoH) Provincial Research Committee.

Participants were invited to partake voluntarily. Specific informed consenting for all procedures were included in the general consent forms for the DCHS (see Appendix H). Consent forms were provided in the participants' home language; either English, Afrikaans, or isiXhosa. An independent witness was available if a participant was illiterate and needed the consent form to be read aloud. Following both verbal and written consent, those who wished to participate completed assessment measures at one time point within the larger parent-study (child age three years). The study had minimal risk and no research-related adverse events. The risk-to-benefit ratio was negligible and measures were taken to reduce it even further. Refreshments (i.e., water, fruit juice, and snacks) were provided to alleviate participants fatigue during the assessment sessions and participants were allowed to have breaks at any point. The participants were each compensated with R100.00 for their time and effort, which is typical for similar South African studies.

Statistical Analysis

All statistical analyses were done using R Statistical Package 2017 and Stata Statistical Software: Release 14. The individual eye tracking blocks were analysed individually as well as cumulatively in order to have a complete assessment of the participants' responses to emotionally valenced stimuli. Two-sample Wilcoxon rank-sum (Mann-Whitney) tests were used (1) to compare scores on the self-report

measures with PTSD status, (2) to compare pupil dilation and PTSD status, and (3) to compare maternal age between the clinical and control groups. Chi-square tests were run to assess differences in demographic variables (education, income, employment) between the two groups. Spearman's Rank-Order Correlation tests and simple linear regression (dilation as the dependent variable and self-report scores as the independent variables) were carried out to see whether the self-report measures correlated with pupillary dilation. Since several correlations were calculated, p-values were corrected for multiple testing.

Chapter 4: Results

Demographics

Of the total 100 participants enrolled in this sub-study, 13 individuals were excluded from the final analysis because they did not meet the minimum criteria for trauma exposure. None of the participants were excluded on the basis of eye tracking quality control. Of the remaining 87 participants, 34 received a diagnosis of lifetime or current PTSD and were allocated to the PTSD group. The remaining 53 trauma-exposed participants were placed in the control group. Demographic data was collected at previous time points within the parent-study. Participants did not significantly differ in age, socioeconomic status, or level of education. Table 1 represents the demographic data for the two groups.

Table 1 Demographics

	PTSD - N (%)	**Control - N (%)**	**Total - N (%)**	**p-value**
Number of participants	34 (39%)	53 (61%)	87	
Age - Median (IQR)	25.0 (22.2, 28.2)	26.3 (23.2, 30.8)	25.7 (22.7, 30.8)	0.33
Years of Education				
Primary	5 (14.7)	2 (3.8)	7 (8.1)	
Some Secondary	19 (55.9)	31 (58.5)	50 (57.5)	
Completed Secondary	10 (29.4)	18 (34.0)	28 (32.2)	
Any Tertiary	0 (0)	2 (3.8)	2 (2.3)	0.21
SES quartiles				
Lowest SES	8 (23.5)	14 (26.4)	22 (25.3)	
Low-Moderate SES	14 (41.2)	10 (18.9)	24 (27.6)	
Moderate-High SES	7 (20.6)	16 (30.2)	23 (26.4)	
High SES	5 (14.7)	13 (24.5)	18 (20.7)	0.14
Income category				
<R1000/m	15 (44.1)	24 (45.3)	39 (44.8)	
R1000-5000/m	16 (47.1)	21 (39.6)	37 (42.5)	
>R5000/m	3 (8.8)	8 (15.1)	11 (12.6)	0.63
Current Employment				
Not Working	27 (79.4)	38 (71.7)	65 (74.7)	
Working	7 (20.6)	15 (28.3)	22 (25.3)	0.42

Hypothesis 1: Compared to trauma-exposed, non-PTSD controls, mothers with current or lifetime PTSD will exhibit greater scores of emotional regulation difficulties on self-report measures.

Of the 87 participants included in the study, 100% completed the DERS and ERQ self-report questionnaires. As predicted, the PTSD group had greater scores of emotional regulation difficulties, as indicated by lower scores on the ERQ and greater scores on the DERS. Only one of the six DERS subscales (Awareness) trended in the opposite direction to that predicted. However, univariate analyses showed that none of the score differences were statistically significant. Table 2 presents the mean scores and p-values of the self-report measures for both groups. Figures 3-11 show the plotted averages of the DERS and ERQ scores for the two groups.

Table 2 Self-Report Scores and PTSD Status

	PTSD – median (IQR)	**Control – median (IQR)**	**p-value**
DERS			
Total	85.5 (72, 98)	82 (68, 101)	0.55
Awareness	14 (13, 18)	15 (13, 19)	0.38
Clarity	11.5 (9, 14)	10 (7, 13)	0.39
Goals	12 (10, 15)	12 (10, 14)	0.54
Impulse	14 (11, 16)	13 (10, 16)	0.71
Non-Acceptance	15 (12, 17)	14 (9, 18)	0.20
Strategies	18 (14, 21)	18 (14, 20)	0.67
ERQ			
Cognitive Reappraisal	29.5 (21, 39)	32 (25, 37)	0.44
Expressive Suppression	16.5 (11, 22)	17 (13, 22)	0.58

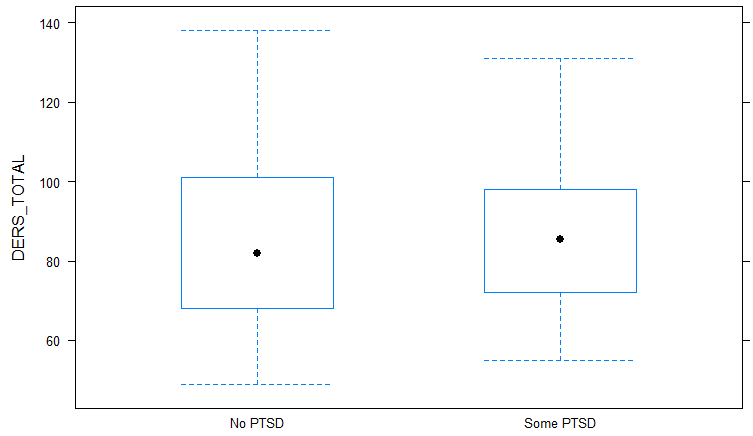


Figure 3 DERS Total Score

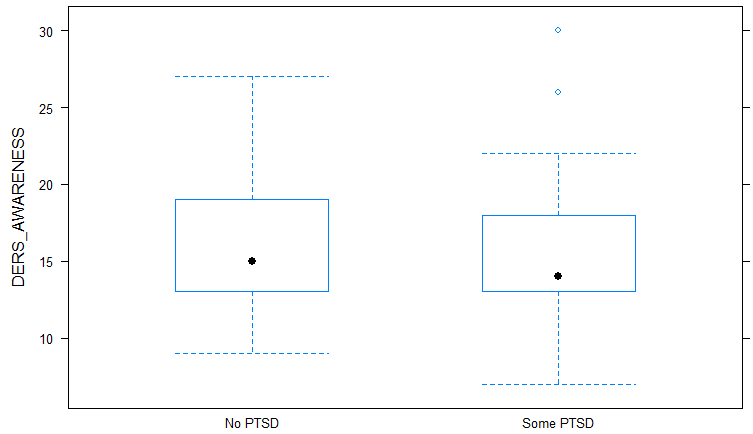


Figure 4 DERS Awareness Subscale

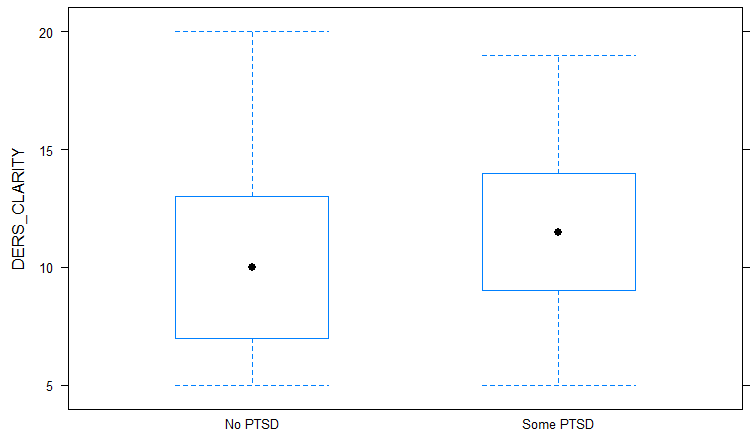


Figure 5 DERS Clarity Subscale

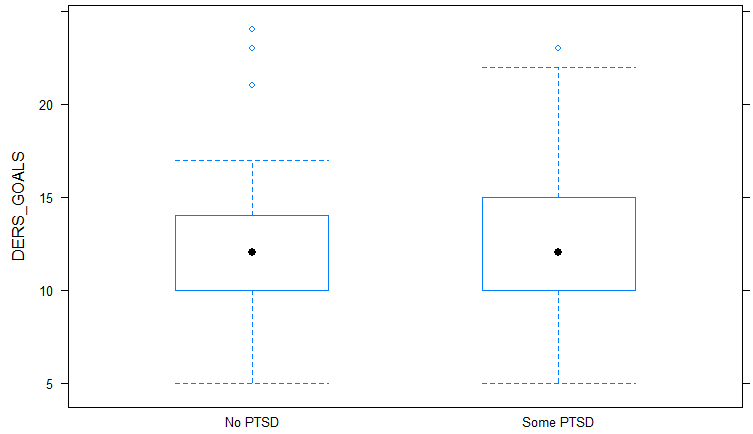


Figure 6 DERS Goals Subscale

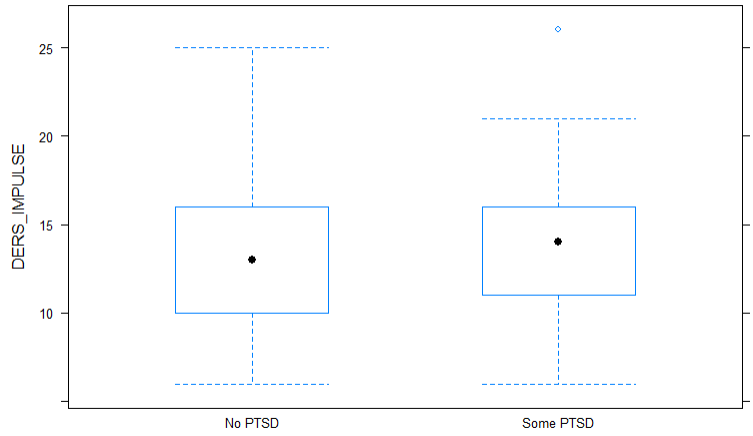


Figure 7 DERS Impulse Subscale

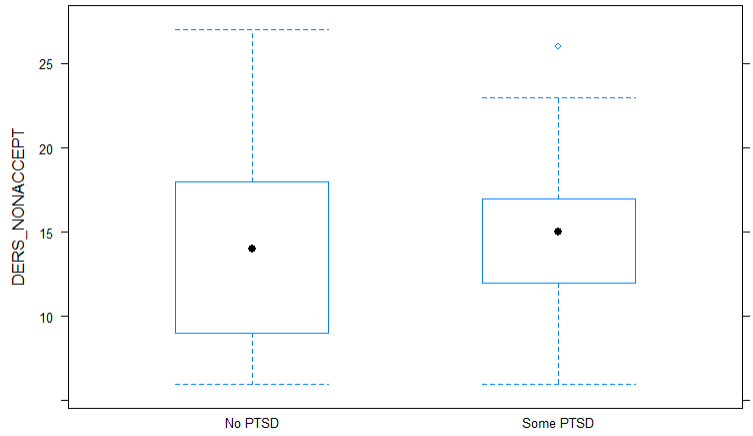


Figure 8 DERS Non-Acceptance Subscale

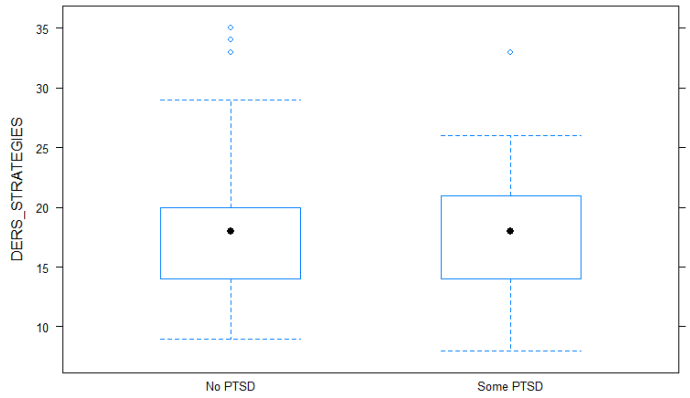


Figure 9 DERS Strategies Subscale

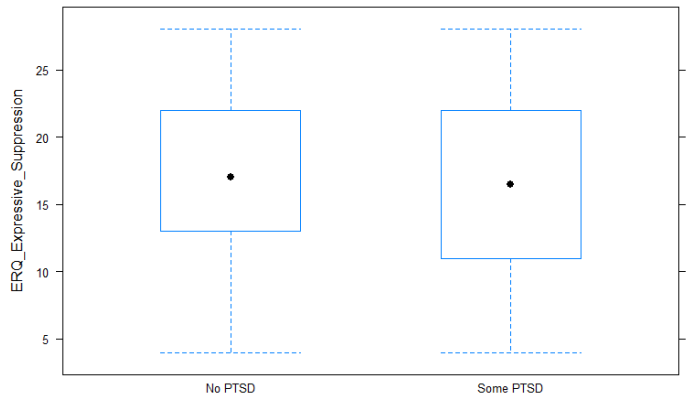


Figure 10 ERQ Expressive Suppression Subscale

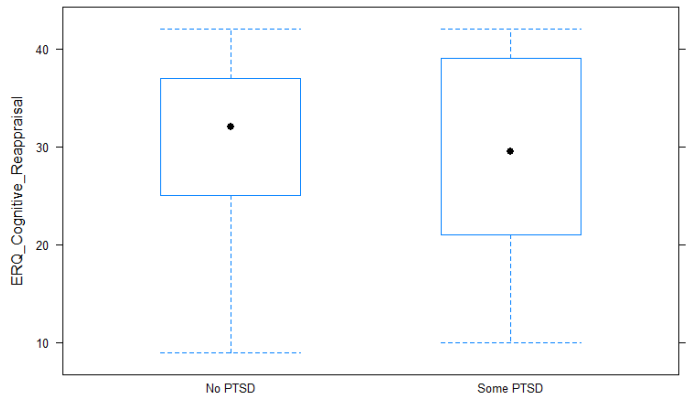


Figure 11 ERQ Cognitive Reappraisal Subscale

Figure 3-11 The PTSD group and trauma-exposed, non-PTSD group did not significantly differ in their responses to the self-report measures on the DERS and ERQ.

Hypothesis 2: Compared to trauma-exposed, non-PTSD controls, mothers with current or lifetime PTSD will exhibit larger pupillary diameter in response to positively and negatively valenced stimuli.

Comparison of pupil response to positively valenced stimuli between PTSD and control groups

Overall pupil dilation was calculated by averaging pupil dilation across all three blocks. When analysing all of the blocks cumulatively, the PTSD group showed a significantly greater pupillary response towards the positive stimuli compared to non-PTSD controls ($p=0.04$). Figure 12 represents the plotted differences in mean pupil dilation between the two groups when all three blocks were analysed cumulatively.

Pupil dilation was also calculated in each of three individual blocks. In block one ($p= 0.01$) and block three ($p=0.06$), participants with PTSD exhibited significantly greater pupillary dilation in response to the positively valenced stimuli compared to controlled participants. In block two ($p=0.88$) there was no significant difference found between the two groups. Figure 13 represents the plotted differences in mean pupil dilation when the three blocks were analysed individually. Table 3 represents pupil size[2] towards the emotionally valenced stimuli for the PTSD group and the trauma-exposed, non-PTSD control group.

[2] Pupil size has been reported as the baseline-corrected pupil size in millimeter (mm) throughout this study. The baseline-correction was calculated by subtracting the mean pupil diameter during the pre-stimulus interval from the mean pupil size during the response time window.

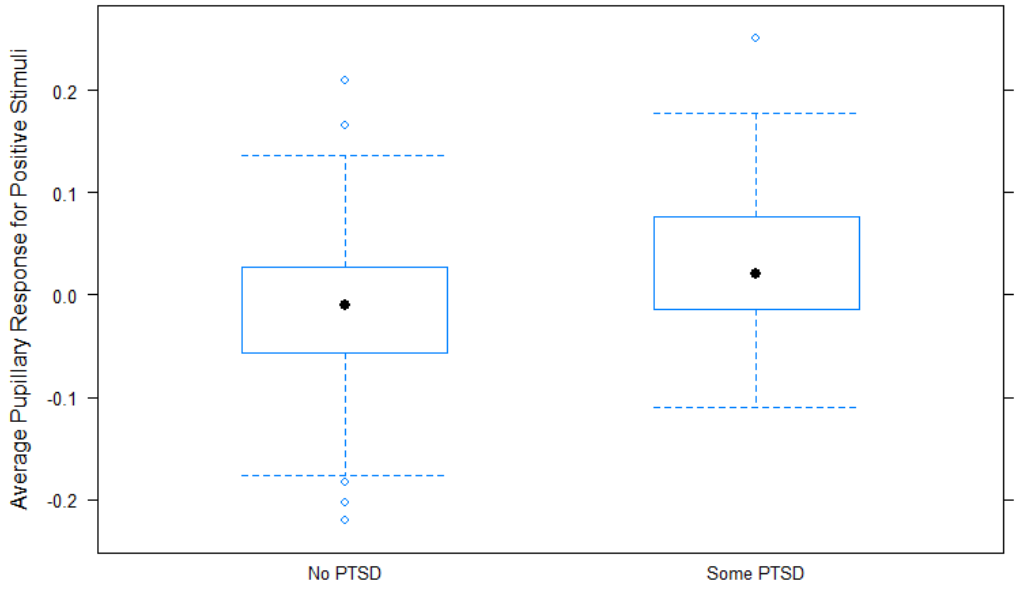


Figure 12 Cumulative Pupillary Response for Positive Stimuli

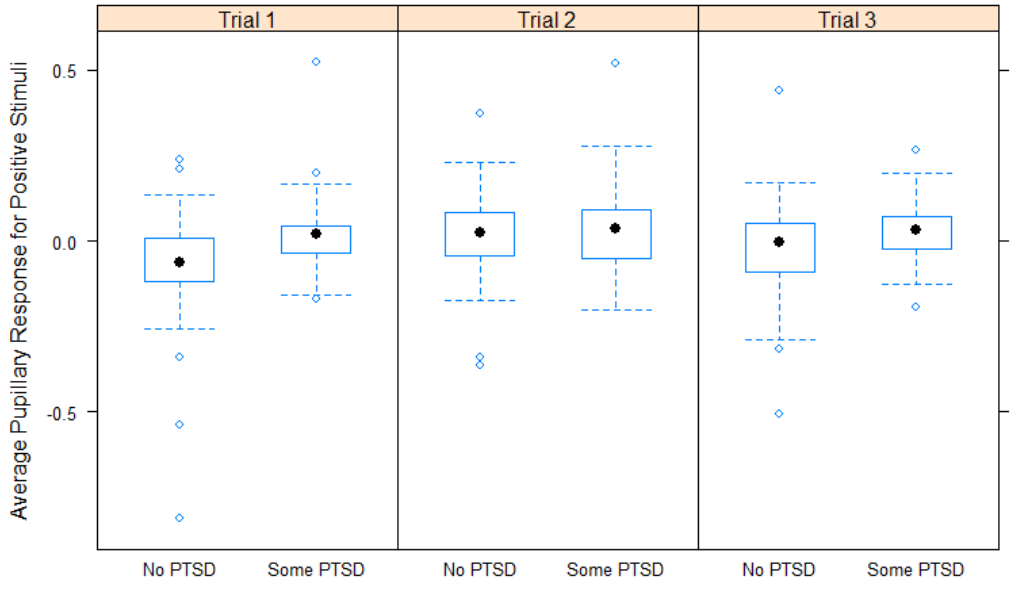


Figure 13 Pupillary Response for Positive Stimuli for Three Blocks

Comparison of pupil response to negatively valenced stimuli between PTSD and control groups

When analysing all blocks cumulatively, using the same method as that used for the positively valenced stimuli, there was no significant difference in pupillary response towards the negatively valenced stimuli between the PTSD group and the control group. Figure 14 represents the plotted differences in mean pupil dilation between the two groups when all three blocks were analysed cumulatively. In addition, when analysing the three blocks individually, there was no significant difference in pupillary response towards the negatively valenced stimuli between the two groups. Figure 15 represents the plotted differences in mean pupil dilation between the two groups when the three blocks were analysed individually.

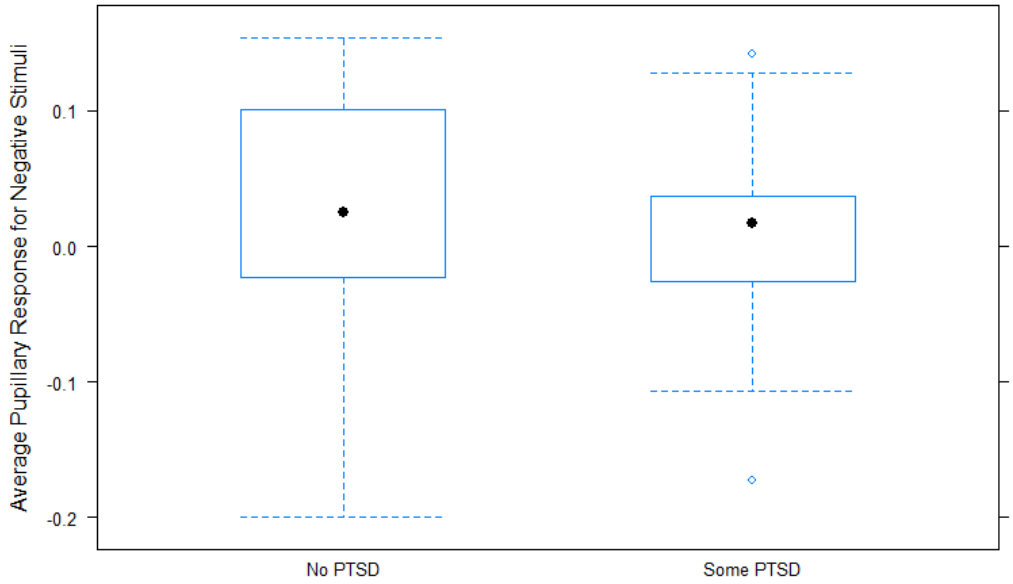


Figure 14 Cumulative Pupillary Response for Negative Stimuli

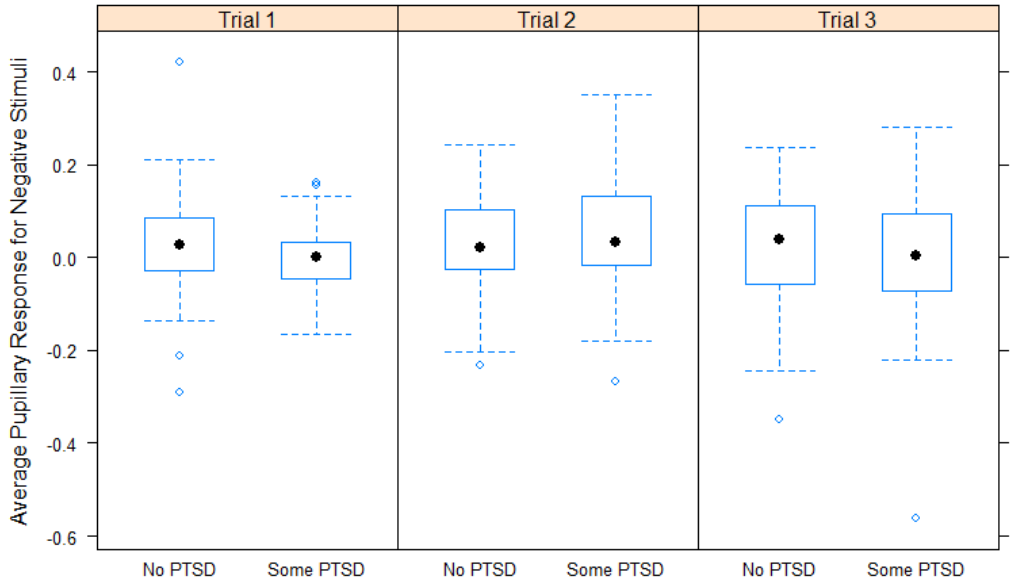


Figure 15 Pupillary Response for Negative Stimuli for the Three Blocks

Table 3 Pupillary Response (mm) and PTSD Status

	PTSD - median (IQR)	**Control - median (IQR)**	**Total - median (IQR)**	**p-value**
Positive				
Overall	.02 (-.01, .08)	-.01 (-.06, .03)	-.01 (-.06, .05)	0.04*
Block 1	.02 (-.04, .05)	-.06 (-.12, .01)	-.03 (-.10, 0.04)	0.01*
Block 2	.03 (-.05, .09)	.02 (-.04, .08)	.02 (-.04, .09)	0.88
Block 3	.03 (-.02, .07)	.00 (-.10, .06)	.00 (-.06, .06)	0.06*
Negative				
Overall	.02 (-.03, .04)	.03 (-.02, .10)	.02 (-.02, .08)	0.20
Block 1	.00 (-.05, .04)	.03 (-.03, .09)	.02 (-.04, .08)	0.09
Block 2	.03 (-.02, .13)	.02 (-.02, .10)	.03 (-.02, .11)	0.50
Block 3	.00 (-.07, .09)	.04 (-.06, .11)	.03 (-.07, .10)	0.29

Hypothesis 3: Participants with greater scores of emotional regulation difficulties on self-report measures will exhibit larger pupillary diameter in response to positively and negatively valenced stimuli.

DERS

No significant associations were found between pupillary response to the emotionally valenced stimuli and total DERS scores. Similarly, no significant associations were found between pupillary response towards the emotionally valenced stimuli and the scores on the DERS subscales.

ERQ

No significant associations were found between pupillary response towards the emotionally valenced stimuli and the ERQ subscales. Table 4 presents the association scores between pupillary response to the emotionally valenced stimuli and the self-report measures.

Although some of the p-values indicated significance, all of the regression coefficients and Spearman's Rho scores were too small in magnitude, and it was concluded that there were no associations between pupillary dilation to emotionally valenced stimuli and self-report scores.

Table 4 Association Between Emotionally Valenced Stimuli and Self-Report Measures

	Spearman's Rho (p-value)	**Regression coefficient (p-value)**
Positively Valenced Stimuli		
DERS		
DERS Cumulative		
Total	0.00 (0.97)	0.000 (0.63)
Block 1	-0.11 (0.32)	0.000 (0.83)
Block 2	0.04 (0.72)	0.000 (0.70)
Block 3	-0.09 (0.43)	0.000 (0.83)
Awareness		
Total	-0.02 (0.82)	-0.002 (0.48)
Block 1	-0.07 (0.53)	0.004 (0.35)
Block 2	-0.10 (0.38)	-0.005 (0.14)
Block 3	-0.08 (0.46)	0.004 (0.35)
Clarity		
Total	0.07 (0.55)	0.002 (0.36)
Block 1	-0.05 (0.68)	0.003 (0.55)
Block 2	0.04 (0.71)	0.005 (0.21)
Block 3	-0.07 (0.55)	0.003 (0.55)
Goals		
Total	-0.03 (0.80)	-0.001 (0.55)
Block 1	-0.08 (0.46)	0.001 (0.77)
Block 2	0.00 (0.97)	0.000 (0.89)
Block 3	-0.03 (0.76)	0.001 (0.77)

Impulse		
Total	0.02 (0.85)	0.000 (0.88)
Block 1	-0.13 (0.26)	-0.001 (0.88)
Block 2	0.07 (0.55)	0.003 (0.41)
Block 3	-0.06 (0.57)	-0.001 (0.88)
Non-Acceptance		
Total	0.04 (0.73)	-0.001 (0.74)
Block 1	-0.14 (0.22)	-0.007 (0.06)
Block 2	0.11 (0.30)	0.004 (0.18)
Block 3	0.00 (0.98)	-0.007 (0.06)
Strategies		
Total	-0.02 (0.87)	-0.001 (0.43)
Block 1	-0.06 (0.59)	-0.001 (0.75)
Block 2	-0.01 (0.93)	0.000 (0.97)
Block 3	-0.03 (0.80)	-0.001 (0.75)
ERQ		
Cognitive Reappraisal		
Total	0.11 (0.31)	0.000 (0.93)
Block 1	-0.07 (0.55)	-0.004 (0.08)
Block 2	0.19 (0.09)	0.002 (0.91)
Block 3	0.12 (0.28)	-0.004 (0.08)
Expressive Suppression		
Total	0.06 (0.59)	0.000 (0.89)
Block 1	-0.08 (0.51)	-0.004 (0.16)
Block 2	0.20 (0.07)	0.003 (0.26)

Block 3	0.07 (0.54)	-0.004 (0.16)
Negatively Valenced Stimuli		
DERS		
DERS Cumulative		
Total	-0.16 (0.14)	-0.001 (0.07)
Block 1	-0.21 (0.06)	-0.001 (0.05)
Block 2	-0.14 (0.21)	-0.001 (0.15)
Block 3	0.03 (0.79)	-0.001 (0.05)
Awareness		
Total	0.00 (0.98)	0.000 (0.87)
Block 1	0.04 (0.69)	0.001 (0.80)
Block 2	-0.07 (0.56)	-0.002 (0.53)
Block 3	-0.03 (0.79)	0.001 (0.80)
Clarity		
Total	-0.02 (0.84)	0.000 (1.0)
Block 1	-0.11 (0.33)	-0.002 (0.55)
Block 2	0.03 (0.78)	0.001 (0.81)
Block 3	0.07 (0.54)	-0.002 (0.55)
Goals		
Total	-0.06 (0.59)	-0.001 (0.45)
Block 1	-0.16 (0.16)	-0.004 (0.14)
Block 2	0.01 (0.93)	0.000 (0.88)
Block 3	0.02 (0.84)	-0.004 (0.14)
Impulse		
Total	-0.23 (0.04)	-0.004 (0.02)

Block 1	-0.24 (0.03)	-0.005 (0.03)
Block 2	-0.26 (0.02)	-0.005 (0.03)
Block 3	0.00 (0.99)	-0.005 (0.03)
Non-Acceptance		
Total	-0.17 (0.13)	-0.003 (0.08)
Block 1	-0.15 (0.19)	-0.003 (0.21)
Block 2	-0.07 (0.51)	-0.002 (0.31)
Block 3	-0.01 (0.96)	-0.003 (0.21)
Strategies		
Total	-0.02 (0.13)	-0.003 (0.02)
Block 1	-0.23 (0.04)	-0.005 (0.01)
Block 2	-0.20 (0.07)	-0.004 (0.04)
Block 3	0.08 (0.46)	-0.005 (0.01)
ERQ		
Cognitive Reappraisal		
Total	0.18 (0.09)	0.001 (0.19)
Block 1	-0.03 (0.79)	0.000 (0.88)
Block 2	0.08 (0.48)	0.001 (0.05)
Block 3	0.19 (0.08)	0.000 (0.88)
Expressive Suppression		
Total	0.10 (0.38)	0.001 (0.06)
Block 1	-0.06 (0.60)	-0.001 (0.75)
Block 2	0.06 (0.61)	0.001 (0.62)
Block 3	0.10 (0.36)	-0.001 (0.75)

Chapter 5: Discussion

To my knowledge, this is the first study to discuss emotional regulation difficulties as a mechanism underlying the unique pupillary response to emotionally valenced stimuli in individuals with PTSD. In response to positively valenced stimuli, a significant difference between participants with PTSD and controls was found. Specifically, participants with PTSD exhibited larger pupillary dilation to the positively valenced stimuli compared to non-PTSD participants. These findings suggest that pupillary response may be used to distinguish between individuals with trauma exposure who develop PTSD and those who do not.

Pupillary Response to Emotionally Valenced Stimuli

There are presently only three studies that have investigated pupillary dilation in response to emotionally valenced stimuli in individuals with PTSD (Cascardi et al., 2015; Felmingham et al., 2011; Kimble et al., 2010). Of the three studies, none discussed underlying mechanisms, such as emotional regulation difficulties, that may lead to variances in pupillary response (Cascardi et al., 2015; Felmingham et al., 2011; Kimble et al., 2010). Only Felmingham et al. (2011) did not find an association, but the researchers used lexical images as stimuli, which have been found to have low salience (Cascardi et al., 2015). In their study-sample of 40 participants, Cascardi et al. (2015) found that individuals with PTSD have increased pupillary dilation when viewing negative stimuli. Similarly, Kimble et al. (2010) found a correlation between PTSD symptom severity and increased pupil size to negative stimuli. None of the existing studies included positively valenced stimuli. Thus, the present study is the first to find that individuals with PTSD have increased pupil dilation to positive stimuli.

Steinhauer et al. (2004) suggests that increased pupil size to an emotional stimulus is a result of PNS inhibition due to demanding cognitive load. Having increased cognitive load makes it more difficult for an individual to inhibit irrelevant information and memories (Lavie, Hirst, de Fockert, & Viding, 2004). Increased cognitive load in individuals with PTSD is believed to be associated with emotional regulation difficulties (Moore & Zoellner, 2012). All of these factors taken together offer a tentative explanation to this study's findings. The PTSD group had increased cognitive load and PNS inhibition, which made it difficult for them to regulate their

emotional response to positive images. While viewing the positively valenced infant faces, the participants with PTSD may have brought up memories and emotions related to the stimuli, which inhibited PNS pupillary constriction, and resulted in increased pupil size (Moore & Zoellner, 2012; Richards & Gross, 2000; Steinhauer, Siegle, Condray, & Pless, 2004).

There was no association found between pupil dilation in response to the negatively valenced stimuli and PTSD status. This was an unexpected result, as two previous studies found an association between pupil dilation and PTSD using negative stimuli (Cascardi et al., 2015; Kimble et al., 2010). An explanation for this unexpected finding may be that this study measured emotional arousal to a greater degree than emotional regulation (Bradley et al., 2008; Kret, Roelofs, Stekelenburg, & de Gelder, 2013; Partala & Surakka, 2003). Pupillary response to an emotional stimulus consists of two phases. The early phase reflects cognitive processes of emotional regulation, whereas the late phase reflects emotional reactions (Kinner et al., 2017). It can take several seconds for an individual to process an emotional stimulus, thus behavioural and physiological reactions are not immediate (Gross, 2015). In the present study, we examined pupillary response 3000-4000 ms after stimulus onset, which was likely indicative of arousal to the stimulus during the late phase. However, PNS response is primarily represented in the early phase, when the pupil reflexively constricts in response to a presented stimulus (Kinner et al., 2017). Thus, to ascertain whether emotional regulation difficulties were present in individuals with PTSD due to PNS impairment, the early phase (less than 1600 ms) should have been assessed while the participants performed an emotional regulation task (Yrttiaho et al., 2017). It would be expected that emotional regulation difficulties in individuals with PTSD would have been indicated by increased dilation in the early phase due to PNS impairment failing to constrict the pupil (N. Cohen et al., 2015).

Cascardi et al. (2015) found that, compared to trauma-exposed controls, individuals with PTSD have greater pupillary dilation to negatively valenced images. Unlike the present study, the researchers did not present stimuli that was personally relevant to the subject group. All of the participants enrolled in the present study were women with at least one child under 4 years of age. Mothers have been found to exhibit increased pupil dilation when shown images of infants in distress or discomfort, compared to when they are shown images of infants with positive facial expressions

(Yrttiaho et al., 2017). Yrttiaho et al. (2017) suggests that this increase in pupil dilation is due to heightened ANS arousal when mothers are presented with negative images of infants. In the present study, it is possible that no difference between the two groups was found in response to negatively valenced stimuli because all mothers, regardless of PTSD status, responded with heightened autonomic arousal to the distressing infant images. Future studies should investigate whether trauma-exposed mothers and mothers with PTSD differ in pupillary response when they are shown negatively valenced images that do not typically cause heightened ANS arousal.

Measuring Emotional Regulation

It was predicted that the PTSD group would have higher scores on the DERS questionnaire and lower scores on the ERQ, both of which are indicative of greater emotional regulation difficulties. Additionally, it was hypothesized that greater self-report scores of emotional regulation difficulties would be associated with increased pupillary dilation. However, there were no significant correlations in either of these hypotheses. This was unexpected, as emotional regulation difficulties have been found to be common in individuals with PTSD and because increased pupil dilation has been associated with emotional regulation difficulties (N. Cohen et al., 2015; Kinner et al., 2017; Klemanski et al., 2012; Powers et al., 2015; Seligowski et al., 2015; Shepherd & Wild, 2014; Sippel et al., 2016; Weiss et al., 2012). A potential explanation is that self-report questionnaires are subjective and inaccurate measures of emotional experiences. Several factors may have influenced the validity of the self-report measures used in this study, including the participants' self-awareness, their ability to ignore social biases, their willingness to accurately respond, and their comprehension of the instructions and questions (Choi & Pak, 2004; Mauss & Robinson, 2009). Many trauma theorists discuss the trauma model of dissociation, which holds that individuals with trauma exposure, primarily those with PTSD, are prone to dissociation, denial, and avoidance of their emotional processes (Kamen et al., 2012; Kulkarni et al., 2012; Lev-Wiesel & Zohar, 2014; Nijenhuis & Van Der Hart, 2011; D. J. Stein et al., 2012). This theory has been explained as "a phylogenetically important aspect of the psychobiological response to threat and danger that allows for automatization of behaviour, analgesia, depersonalization, and isolation of catastrophic experiences to enhance survival during and in the aftermath

of these events" (Dalenberg et al., 2012). This notion, that individuals with trauma exposure are likely to dissociate from their emotional processes, may have affected the validity of the self-report measures by making it unlikely for the participants to accurately report on their emotional regulation abilities. The results of this study indicated that only two out of the eight subscales (2/6 on the DERS and 0/2 on the ERQ) trended in the opposite direction from those predicted. Furthermore, the cumulative DERS score trended in the predicted direction (there is no cumulative ERQ score). This suggests that those in the PTSD group may have had greater emotional regulation difficulties than the trauma-exposed, non-PTSD group, but the self-report measures were not strong enough to capture the difference to a statistically significant degree.

Unlike self-report questionnaires, physiological measures cannot be controlled by a participant's ability or willingness to report on his or her emotions (H. Cohen et al., 2000; Shepherd & Wild, 2014). An association between PTSD and emotional regulation difficulties has been found when researchers used objective measures, such as RSA (Shepherd & Wild, 2014; Stange et al., 2017). RSA is a commonly used objective measure, as it is an index of PNS processes that are believed to reflect emotional regulation (Beauchaine, 2015; Blechert, Michael, Grossman, Lajtman, & Wilhelm, 2007; Katz & Gurtovenko, 2015; Laborde et al., 2017; Stange et al., 2017). RSA has been found to be lower in individuals with PTSD, reflecting their difficulties regulating emotions (H. Cohen et al., 2000; Graziano & Derefinko, 2013; Sack, Hopper, & Lamprecht, 2004; Tan, Dao, Farmer, Sutherland, & Gevirtz, 2011; Zucker, Samuelson, Muench, Greenberg, & Gevirtz, 2009). It is likely that the PTSD group in this study had emotional regulation difficulties that were not represented by the self-report scores. Future studies on emotional regulation in trauma-exposed participants should rely less on self-report measures and rather investigate more objective methods. Although there is no gold standard for objectively measuring emotional regulation, physiological responses to PNS processes offer a promising method. Specifically, pupillometry should be investigated in future studies of emotional regulation as pupillometry is easy to administer, inexpensive, non-intrusive, and is not amenable to voluntary control.

Limitations and Recommendations for Future Research

The present study has several limitations. As previously discussed, the method of measuring pupillary responses to emotional stimuli may have been more indicative of emotional arousal than of emotional regulation. This study presented emotionally valenced stimuli to the participants without giving them a task. In future studies, emotional regulation should be assessed by requiring the participants to perform an emotional regulation task (Kinner et al., 2017). For example, Kinner et al. (2017) assessed emotional regulation by asking the participants to either up-regulate, down-regulate, or maintain their emotions to various stimuli. While the individual is performing the task, the early stage of pupillary response should be measured. This will allow PNS processes to be observed and can help determine whether emotional regulation affects PNS responses (Yrttiaho et al., 2017).

A second limitation was that the negatively valenced stimuli used in this study received a strong negative rating ($M>2.9$, $SD<0.2$), whereas the positively valenced stimuli only received a mild rating ($M=1.8$, $SD=0.1$). Future studies should use stimuli that have greater positive valence.

A third limitation was that current PTSD was not represented in the PTSD group. Only two participants were diagnosed with current PTSD. The remaining participants in the PTSD group ($N=32$) were diagnosed with lifetime PTSD. It is possible that participants who previously met criteria for PTSD differ in their processing of emotional stimuli compared to those who are currently experiencing symptoms. More research needs to be conducted as to how individuals with lifetime and current PTSD differ in emotional regulation abilities.

A fourth limitation was the environmental settings in which the eye tracking exam occurred. In several cases, the mothers performed the assessment while her child remained in the room. Having a child present while viewing images of infant faces may have interfered with the validity of the stimuli.

An additional limitation regarding the stimuli was that racial biases in facial processing may have occurred as the infants in the stimuli were Caucasian, while the participants were of African ancestry and mixed-race (Ekman, Friesen, O Sullivan, Chan, & Heider, 1987; Elfenbein & Ambady, 2003). These stimuli-related limitations may be addressed in future research by including a diverse study-sample.

Strengths

The present study addressed several limitations in the existing literature on pupillary dilation in individuals with PTSD. First, this study included both negative and positive stimuli, whereas the existing studies have used only negative stimuli. Positive stimuli were an important addition, as it was found that individuals with PTSD have different processing of positively valenced stimuli compared to trauma-exposed individuals. Second, the present study consisted of a significantly larger sample size (N=83) than those in related studies, which contained sample sizes of only 19-40 participants. Third, this was the only study that preceded each stimulus with a scrambled non-face image that uniquely matched the upcoming stimulus in grayscale intensity. This was an important aspect to include, as the prestimulus has been shown to control for pupillary light reflex (Yrttiaho et al., 2017).

Conclusion

The difference in pupil dilation to the positively valenced stimuli indicate that pupillometry can be used to differentiate between individuals with trauma exposure and those who develop PTSD. The findings suggest that individuals with PTSD may have emotional regulation difficulties that are associated with greater cognitive load and PNS impairment. More research needs to be conducted in order to better understand the mechanisms behind the difference in the processing of emotionally valenced stimuli. A potential implication is that techniques to improve PNS functioning can be incorporated into PTSD treatment (Cascardi et al., 2015; N. Cohen et al., 2015). These findings may help bring forward improved prevention, diagnosis, and treatments for the maintenance of PTSD. Taking into account the present study and previous findings, pupillometry should continue to be utilized to investigate the mechanisms underlying emotional regulation difficulties in individuals with PTSD.

Chapter 6: Bibliography

Afifi, T. O., Asmundson, G. J. G., Taylor, S., & Jang, K. L. (2010). The role of genes and environment on trauma exposure and posttraumatic stress disorder symptoms: A review of twin studies. *Clinical Psychology Review, 30*(1), 101-112. doi:10.1016/j.cpr.2009.10.002

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders.* (Vol. 5th). Arlington, VA: American Psychiatric Publishing.

APA. (2000). *Diagnostic and statistical manual of mental disorders* (Vol. 4th). Washington, DC: American Psychiatric Publishing

APA. (2013). *Diagnostic and statistical manual of mental disorders.* (Vol. 5th). Arlington, VA: American Psychiatric Publishing.

APA. (2017). *Clinical Practice Guideline for the Treatment of Posttraumatic Stress Disorder (PTSD) in Adults*. Retrieved from https://www.apa.org/ptsd-guideline/ptsd.pdf

Armstrong, T., Bilsky, S. A., Zhao, M., & Olatunji, B. O. (2013). Dwelling on potential threat cues: an eye movement marker for combat-related PTSD. *Depression and Anxiety, 30*(5), 497-502. doi:10.1002/da.22115

Atwoli, L., Stein, D. J., Koenen, K. C., & McLaughlin, K. A. (2015). Epidemiology of posttraumatic stress disorder: prevalence, correlates and consequences. *Current opinion in psychology, 28*(4), 307. doi:10.1097/YCO.0000000000000167

Atwoli, L., Stein, D. J., Williams, D. R., McLaughlin, K. A., Petukhova, M., Kessler, R. C., & Koenen, K. C. (2013). Trauma and posttraumatic stress disorder in South Africa: analysis from the South African Stress and Health Study. *BMC Psychiatry*. doi:10.1186/1471-244X-13-182

Auxéméry, Y. (2012). Posttraumatic stress disorder (PTSD) as a consequence of the interaction between an individual genetic susceptibility, a traumatogenic event and a social context. *L'Encephale, 38*(5), 373. doi:10.1016/j.encep.2011.12.003

Ayazi, T., Lien, L., Eide Arne, H., Ruom, M., & Hauff, E. (2012). What are the risk factors for the comorbidity of posttraumatic stress disorder and depression in a war-affected population? a cross-sectional community study in South Sudan. *BMC Psychiatry, 12*(1), 175. doi:10.1186/1471-244X-12-175

Banerjee, S. B., Morrison, F. G., & Ressler, K. J. (2017). Genetic approaches for the study of PTSD: Advances and challenges. *Neuroscience Letters*. doi:10.1016/j.neulet.2017.02.058

Beauchaine, T. P. (2015). Respiratory sinus arrhythmia: a transdiagnostic biomarker of emotion dysregulation and psychopathology. *Current opinion in psychology, 3*, 43-47. doi:10.1016/j.copsyc.2015.01.017

Belsher, B. E., Ruzek, J. I., Bongar, B., & Cordova, M. J. (2012). Social Constraints, Posttraumatic Cognitions, and Posttraumatic Stress Disorder in Treatment-Seeking Trauma Survivors: Evidence for a Social-Cognitive Processing Model. *Psychological Trauma: Theory, Research, Practice, and Policy, 4*(4), 386-391. doi:10.1037/a0024362

Bisson, J. I., Roberts, N. P., Andrew, M., Cooper, R., & Lewis, C. (2013). Psychological therapies for chronic posttraumatic stress disorder (PTSD)

in adults. *Cochrane Depression, Anxiety and Neurosis Group*(2). doi:10.1002/14651858.CD003388.pub4

Blechert, J., Michael, T., Grossman, P., Lajtman, M., & Wilhelm, F. H. (2007). Autonomic and respiratory characteristics of posttraumatic stress disorder and panic disorder. *Psychosomatic medicine, 69*(9), 935. doi:10.1097/PSY.0b013e31815a8f6b

Bonn-Miller, M. O., Vujanovic, A. A., Boden, M. T., & Gross, J. J. (2011). Posttraumatic Stress, Difficulties in Emotion Regulation, and Coping-Oriented Marijuana Use. *Cognitive Behaviour Therapy, 40*(1), 34-44. doi:10.1080/16506073.2010.525253

Bradley, M. M., Miccoli, L., Escrig, M. A., & Lang, P. J. (2008). The pupil as a measure of emotional arousal and autonomic activation. *Psychophysiology, 45*(4), 602-607. doi:10.1111/j.1469-8986.2008.00654.x

Brady, K. T., Back, S. E., & Coffey, S. F. (2004). Substance Abuse and Posttraumatic Stress Disorder. *Current Directions in Psychological Science, 13*(5), 206-209. doi:10.1111/j.0963-7214.2004.00309.x

Brady, R. E., Constans, J. I., Marx, B. P., Spira, J. L., Gevirtz, R., Kimbrell, T. A., . . . Pyne, J. M. (2015). Effect of Symptom Over-reporting on Heart Rate Variability in Veterans with PTSD. *Journal of Trauma & Dissociation*. doi:10.1080/15299732.2015.1021505

Bremner, F. (2009). Pupil evaluation as a test for autonomic disorders. *Clinical autonomic research : official journal of the Clinical Autonomic Research Society, 19*(2), 88. doi:10.1007/s10286-009-0515-2

Breslau, N., Davis, G. C., Andreski, P., & Peterson, E. (1991). Traumatic events and posttraumatic stress disorder in an urban population of young adults. *Archives of general psychiatry, 48*(3), 216.

Breslau, N., Lucia, V., & Davis, G. (2004). Partial PTSD versus full PTSD: An empirical examination of associated impairment. *Psychological Medicine, 34*(7), 1205-1214.

Brunet, A., Weiss, D., Metzler, T., & Best, S. (2001). The peritraumatic distress inventory: A proposed measure of PTSD criterion A2. *The American Journal of Psychiatry, 158*(9), 1480-1485. doi:10.1176/appi.ajp.158.9.1480

Canero, E. M., & Hermitte, G. (2014). New evidence on an old question: Is the "fight or flight" stage present in the cardiac and respiratory regulation of decapod crustaceans? *Journal of Physiology - Paris, 108*(2-3), 174-186. doi:10.1016/j.jphysparis.2014.07.001

Carey, P. D., Stein, D. J., Zungu-Dirwayi, N., & Seedat, S. (2003). Trauma and posttraumatic stress disorder in an urban Xhosa primary care population: prevalence, comorbidity, and service use patterns. *The Journal of nervous and mental disease, 191*(4), 230. doi:10.1097/00005053-200304000-00003

Cascardi, M., Armstrong, D., Chung, L., & Pare, D. (2015). Pupil Response to Threat in Trauma Exposed Individuals With or Without PTSD. *Journal of Traumatic Stress, 28*(4), 370-374. doi:10.1002/jts.22022

Chakraborty, N., Meyerhoff, J., Gautam, A., Muhie, S., Jibitu, M., De Lima, T. C. M., . . . Jett, M. (2015). Gene and stress history interplay in emergence of PTSD-like features. *Behavioural Brain Research, 292*, 266-277.

doi:10.1016/j.bbr.2015.05.038
Charuvastra, A., & Cloitre, M. (2008). Social bonds and posttraumatic stress disorder. *Annual review of psychology, 59*, 301.
Chen, L., Zhang, G., Hu, M., & Liang, X. (2015). Eye movement desensitization and reprocessing versus cognitive-behavioral therapy for adult posttraumatic stress disorder: systematic review and meta-analysis. *The Journal of nervous and mental disease, 203*(6), 443. doi:10.1097/NMD.0000000000000306
Choi, B. C. K., & Pak, A. W. P. (2004). A Catalog of Biases in Questionnaires. *Preventing chronic disease, 2*(1).
Clary, C., Fayyad, R., & Endicott, J. (2005). Quality-of-Life Impairment in Depressive and Anxiety Disorders. *The American Journal of Psychiatry, 162*(6), 1171-1178.
Cloitre, M., Miranda, R., Stovall-Mcclough, K. C., & Han, H. (2005). Beyond PTSD: Emotion regulation and interpersonal problems as predictors of functional impairment in survivors of childhood abuse. *Behavior Therapy, 36*(2), 119-124. doi:10.1016/S0005-7894(05)80060-7
Closson, K., Dietrich, J. J., Nkala, B., Musuku, A., Cui, Z., Chia, J., . . . Kaida, A. (2016). Prevalence, type, and correlates of trauma exposure among adolescent men and women in Soweto, South Africa: implications for HIV prevention. *BMC public health, 16*(1), 1191. doi:10.1186/s12889-016-3832-0
Cohen, H., Benjamin, J., Geva, A. B., Matar, M. A., Kaplan, Z., & Kotler, M. (2000). Autonomic dysregulation in panic disorder and in post-traumatic stress disorder: application of power spectrum analysis of heart rate variability at rest and in response to recollection of trauma or panic attacks. *Psychiatry Research, 96*(1), 1-13. doi:10.1016/S0165-1781(00)00195-5
Cohen, N., Moyal, N., & Henik, A. (2015). Executive control suppresses pupillary responses to aversive stimuli. *Biological Psychology, 112*, 1-11. doi:10.1016/j.biopsycho.2015.09.006
Constans, J. I., Kimbrell, T. A., Nanney, J. T., Marx, B. P., Jegley, S., & Pyne, J. M. (2014). Over-Reporting Bias and the Modified Stroop Effect in Operation Enduring and Iraqi Freedom Veterans With and Without PTSD. *Journal of Abnormal Psychology, 123*(1), 81-90. doi:10.1037/a0035100
CrimeStats. (2015). Crime Stats SA. Retrieved from http://www.crimestatssa.com/national.php
Crises, R. (2017). Rape Crises. Retrieved from http://rapecrisis.org.za/
Dai, W. K., A. C. Tan, H. Wang, J. Lai, Z. Wu, X. Liu, A. (2017). Long-term psychological outcomes of flood survivors of hard-hit areas of the 1998 Dongting Lake flood in China: Prevalence and risk factors*., 12*(2), e0171557.
Dalenberg, C. J., Brand, B. L., Gleaves, D. H., Dorahy, M. J., Loewenstein, R. J., Cardena, E., . . . Spiegel, D. (2012). Evaluation of the Evidence for the Trauma and Fantasy Models of Dissociation. *Psychological Bulletin*(3), 550-588. doi:10.1037/a0027447
Danielson, C. K., Hankin, B. L., & Badanes, L. S. (2015). Youth offspring of mothers with posttraumatic stress disorder have altered stress reactivity in response to a laboratory stressor. *Psychoneuroendocrinology, 53*, 170-178. doi:10.1016/j.psyneuen.2015.01.001

Davidson, J. R. (2001). Recognition and treatment of posttraumatic stress disorder. *JAMA, 286*(5), 584.

Digangi, J. A., Gomez, D., Mendoza, L., Jason, L. A., Keys, C. B., & Koenen, K. C. (2013). Pretrauma risk factors for posttraumatic stress disorder: A systematic review of the literature. *Clinical Psychology Review, 33*(6), 728-744. doi:10.1016/j.cpr.2013.05.002

Ehring, T., & Quack, D. (2010). Emotion Regulation Difficulties in Trauma Survivors: The Role of Trauma Type and PTSD Symptom Severity. *Behavior Therapy, 41*(4), 587-598. doi:10.1016/j.beth.2010.04.004

Ekman, P., Friesen, W., O Sullivan, M., Chan, A., & Heider, K. (1987). Universals and Cultural Differences in the Judgments of Facial Expressions of Emotion. *Journal of Personality and Social Psychology, 53*(4), 712.

Elfenbein, H. A., & Ambady, N. (2003). When Familiarity Breeds Accuracy: Cultural Exposure and Facial Emotion Recognition. *Journal of Personality and Social Psychology, 85*(2), 276-290. doi:10.1037/0022-3514.85.2.276

Felmingham, K. L., Rennie, C., Manor, B., & Bryant, R. A. (2011). Eye tracking and physiological reactivity to threatening stimuli in posttraumatic stress disorder. *Journal of Anxiety Disorders, 25*(5), 668-673. doi:10.1016/j.janxdis.2011.02.010

Fitzgerald, J. M., Macnamara, A., Kennedy, A. E., Rabinak, C. A., Rauch, S. A. M., Liberzon, I., & Phan, K. L. (2017). Individual differences in cognitive reappraisal use and emotion regulatory brain function in combat-exposed veterans with and without PTSD. *Depression and Anxiety, 34*(1), 79-88. doi:10.1002/da.22551

Friedman, M. J., Resick, P. A., Bryant, R. A., & Brewin, C. R. (2011). Considering PTSD for DSM-5. *Depression and Anxiety, 28*(9), 750-769. doi:10.1002/da.20767

Frueh, B. C., Hamner, M. B., Cahill, S. P., Gold, P. B., & Hamlin, K. L. (2000). Apparent symptom overreporting in combat veterans evaluated for ptsd. *Clinical Psychology Review, 20*(7), 853-885. doi:10.1016/S0272-7358(99)00015-X

Galea, S., Basham, K., Culpepper, L., Davidson, J., Foa, E., Kizer, K., . . . Zatzick, D. (2014). *Treatment for posttraumatic stress disorder in military and veteran populations : final assessment*. Washington, District of Columbia The National Academies Press.

Goldstein, B., Bradley, B., Ressler, K. J., & Powers, A. (2017). Associations Between Posttraumatic Stress Disorder, Emotion Dysregulation, and Alcohol Dependence Symptoms Among Inner City Females. *Journal of Clinical Psychology, 73*(3), 319-330. doi:10.1002/jclp.22332

Granholm, E., & Steinhauer, S. R. (2004). Pupillometric measures of cognitive and emotional processes. *International Journal of Psychophysiology, 52*(1), 1-6. doi:10.1016/j.ijpsycho.2003.12.001

Gratz, K., & Roemer, L. (2008). Multidimensional Assessment of Emotion Regulation and Dysregulation: Development, Factor Structure, and Initial Validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment, 30*(4), 315-315. doi:10.1007/s10862-008-9102-4

Graziano, P., & Derefinko, K. (2013). Cardiac vagal control and children's adaptive functioning: A meta-analysis. *Biological Psychology, 94*(1), 22-

37. doi:10.1016/j.biopsycho.2013.04.011
Greenberg, N., Brooks, S., & Dunn, R. (2015). Latest developments in post-traumatic stress disorder: diagnosis and treatment. *British Medical Bulletin, 114*(1), 147-155. doi:10.1093/bmb/ldv014
Grekin, R., & O'Hara, M. W. (2014). Prevalence and risk factors of postpartum posttraumatic stress disorder: A meta-analysis. *Clinical Psychology Review, 34*(5), 389-401. doi:10.1016/j.cpr.2014.05.003
Gross, J. J. (1998). The Emerging Field of Emotion Regulation: An Integrative Review. *Review of General Psychology, 2*(3), 271-299. doi:10.1037/1089-2680.2.3.271
Gross, J. J. (2015). Emotion Regulation: Current Status and Future Prospects. *Psychological Inquiry, 26*(1), 1-26. doi:10.1080/1047840X.2014.940781
Gross, J. J., & John, O. P. (2003). Individual Differences in Two Emotion Regulation Processes: Implications for Affect, Relationships, and Well-Being. *Journal of Personality and Social Psychology, 85*(2), 348-362. doi:10.1037/0022-3514.85.2.348
Guay, S., Billette, V., & Marchand, A. (2006). Exploring the links between posttraumatic stress disorder and social support: Processes and potential research avenues. *Journal of Traumatic Stress, 19*(3), 327-338. doi:10.1002/jts.20124
Guo, J., He, H., Qu, Z., Wang, X., & Liu, C. (2017). Post-traumatic stress disorder and depression among adult survivors 8 years after the 2008 Wenchuan earthquake in China. *Journal of Affective Disorders, 210*, 27-34. doi:10.1016/j.jad.2016.12.009
Henckens, M. J. A. G., Hermans, E. J., Pu, Z., Joëls, M., & Fernández, G. (2009). Stressed memories: how acute stress affects memory formation in humans. *The Journal of neuroscience : the official journal of the Society for Neuroscience, 29*(32), 10111. doi:10.1523/JNEUROSCI.1184-09.2009
Henderson, R. R., Bradley, M. M., & Lang, P. J. (2014). Modulation of the initial light reflex during affective picture viewing. *Psychophysiology, 51*(9), 815-818. doi:10.1111/psyp.12236
Henry, D. (2006). Violence and the Body: Somatic Expressions of Trauma and Vulnerability during War. *Medical Anthropology Quarterly, 20*(3), 379-398. doi:10.1525/maq.2006.20.3.379
Hinton, D. E., Kredlow, M. A., Bui, E., Pollack, M. H., & Hofmann, S. G. (2012). Treatment change of somatic symptoms and cultural syndromes among Cambodian refugees with PTSD. *Depression and Anxiety, 29*(2), 148-155. doi:10.1002/da.20905
Hinton, D. E., Kredlow, M. A., Pich, V., Bui, E., & Hofmann, S. G. (2013). The relationship of PTSD to key somatic complaints and cultural syndromes among Cambodian refugees attending a psychiatric clinic: The Cambodian Somatic Symptom and Syndrome Inventory (CSSI). *Transcultural Psychiatry, 50*(3), 347-370. doi:10.1177/1363461513481187
Hinton, D. E., & Lewis-Fernandez, R. (2010). The cross-cultural validity of posttraumatic stress disorder: implications for DSM-5. *Depression and Anxiety, 28*(9), 783-801.
Hoge, C., Terhakopian, A., Castro, C., Messer, S., & Engel, C. (2007). Association of Posttraumatic Stress Disorder With Somatic Symptoms, Health Care

Visits, and Absenteeism Among Iraq War Veterans. *The American Journal of Psychiatry, 164*(1), 150-153.

Hopper, J. W., Spinazzola, J., Simpson, W. B., & van Der Kolk, B. A. (2006). Preliminary evidence of parasympathetic influence on basal heart rate in posttraumatic stress disorder. *Journal of Psychosomatic Research, 60*(1), 83-90. doi:10.1016/j.jpsychores.2005.06.002

Isaacowitz, D. M., Livingstone, K. M., Harris, J. A., & Marcotte, S. L. (2015). Mobile Eye Tracking Reveals Little Evidence for Age Differences in Attentional Selection for Mood Regulation. *Emotion, 15*(2), 151-161. doi:10.1037/emo0000037

Javidi, H., & Yadollahie, M. (2011). Post-traumatic Stress Disorder. *The International Journal of Occupational and Environmental Medicine, 3*(1), 2-9. doi:10.1038/sj.bdj.2014.1165

Jordan, W. S. (2015). The Genetics of Stress-Related Disorders: PTSD, Depression and Anxiety Disorders. *Neuropsychopharmacology*. doi:10.1038/npp.2015.266

Kamen, C., Bergstrom, J., Koopman, C., Lee, S., & Gore-Felton, C. (2012). Relationships Among Childhood Trauma, Posttraumatic Stress Disorder, and Dissociation in Men Living with HIV/AIDS. *Journal of Trauma & Dissociation, 13*(1), 102-114. doi:10.1080/15299732.2011.608629

Kaminer, D., Grimsrud, A., Myer, L., Stein, D. J., & Williams, D. R. (2008). Risk for post-traumatic stress disorder associated with different forms of interpersonal violence in South Africa. *Social Science & Medicine, 67*(10), 1589-1595. doi:10.1016/j.socscimed.2008.07.023

Kaniasty, K., & Norris, F. H. (2008). Longitudinal linkages between perceived social support and posttraumatic stress symptoms: sequential roles of social causation and social selection. *Journal of Traumatic Stress, 21*(3), 274. doi:10.1002/jts.20334

Kashdan, T. B., Uswatte, G., Steger, M. F., & Julian, T. (2006). Fragile self-esteem and affective instability in posttraumatic stress disorder. *Behaviour Research and Therapy, 44*(11), 1609-1619. doi:10.1016/j.brat.2005.12.003

Katz, L. F., & Gurtovenko, K. (2015). Posttraumatic Stress and Emotion Regulation in Survivors of Intimate Partner Violence. *Journal of Family Psychology, 29*(4), 528-536. doi:10.1037/fam0000128

Kennell and Associates Inc. (2013). DoD response to data request from the Committee on the Assessment of Ongoing Efforts in the Treatment of PTSD. Falls Church, VA.

Kim, S. H., & Hamann, S. (2007). Neural Correlates of Positive and Negative Emotion Regulation. *Journal of Cognitive Neuroscience, 19*(5), 776-798. doi:10.1162/jocn.2007.19.5.776

Kimble, M. O., Fleming, K., Bandy, C., Kim, J., & Zambetti, A. (2010). Eye tracking and visual attention to threating stimuli in veterans of the Iraq war. *Journal of Anxiety Disorders, 24*(3), 293-299. doi:10.1016/j.janxdis.2009.12.006

Kimerling, R., Alvarez, J., Pavao, J., Mack, K. P., Smith, M. W., & Baumrind, N. (2009). Unemployment Among Women. *Journal of Interpersonal Violence, 24*(3), 450-463. doi:10.1177/0886260508317191

Kinner, V. L., Kuchinke, L., Dierolf, A. M., Merz, C. J., Otto, T., & Wolf, O. T. (2017).

What our eyes tell us about feelings: Tracking pupillary responses during emotion regulation processes: Pupillary responses during emotion regulation. *Psychophysiology, 54*(4), 508-518. doi:10.1111/psyp.12816

Klemanski, D. H., Mennin, D. S., Borelli, J. L., Morrissey, P. M., & Aikins, D. E. (2012). Emotion-related regulatory difficulties contribute to negative psychological outcomes in active-duty Iraq war soldiers with and without posttraumatic stress disorder. *Depression and Anxiety, 29*(7), 621-628. doi:10.1002/da.21914

Koen, N., Wyatt, G. E., Williams, J. K., Zhang, M., Myer, L., Zar, H. J., & Stein, D. J. (2014). Intimate partner violence: associations with low infant birthweight in a South African birth cohort. *Metabolic brain disease, 29*(2), 281. doi:10.1007/s11011-014-9525-4

Koenen, A, R., L, N., KA, M., EJ, B., DJ, S., ..., K. R. (2017). Posttraumatic stress disorder in the World Mental Health Surveys. *Psychol Med.*

Kohrt, B., & Hruschka, D. (2010). Nepali Concepts of Psychological Trauma: The Role of Idioms of Distress, Ethnopsychology and Ethnophysiology in Alleviating Suffering and Preventing Stigma. *Culture, Medicine and Psychiatry, 34*(2), 322-352. doi:10.1007/s11013-010-9170-2

Kret, M. E., Roelofs, K., Stekelenburg, J. J., & de Gelder, B. (2013). Emotional signals from faces, bodies and scenes influence observer's face expressions, fixations and pupil-size. *Frontiers in human neuroscience, 7*, 8-10. doi:10.3389/fnhum.2013.00810

Krug, E., Dahlberg, L., Mercy, J., Zwi, A., & Lozano, R. (2002). *World report on violence and health*. Geneva: World Health Organization.

Kulkarni, M., Porter, K. E., & Rauch, S. A. M. (2012). Anger, dissociation, and PTSD among male veterans entering into PTSD treatment. *Journal of Anxiety Disorders, 26*(2), 271-278. doi:10.1016/j.janxdis.2011.12.005

Laborde, S., Mosley, E., & Thayer, J. F. (2017). Heart Rate Variability and Cardiac Vagal Tone in Psychophysiological Research – Recommendations for Experiment Planning, Data Analysis, and Data Reporting. *Frontiers in psychology, 8*. doi:10.3389/fpsyg.2017.00213

Lavie, N., Hirst, A., de Fockert, J. W., & Viding, E. (2004). Load Theory of Selective Attention and Cognitive Control. *Journal of Experimental Psychology: General, 133*(3), 339-354.

Lev-Wiesel, R., & Zohar, G. (2014). The Role of Dissociation in Self-Injurious Behavior among Female Adolescents Who Were Sexually Abused. *Journal of Child Sexual Abuse*. doi:10.1080/10538712.2014.950399

Liberzon, I., & Sripada, C. S. (2007). The functional neuroanatomy of PTSD: a critical review. *Progress in Brain Research, 167*, 151-169. doi:10.1016/S0079-6123(07)67011-3

Logan, D. E., Claar, R. L., & Scharff, L. (2008). Social desirability response bias and self-report of psychological distress in pediatric chronic pain patients. *Pain, 136*(3), 366-372. doi:10.1016/j.pain.2007.07.015

Lyons-Ruth, K., & Block, D. (1996). The disturbed caregiving system: Relations among childhood trauma, maternal caregiving, and infant affect and attachment. *Infant Mental Health Journal, 17*(3), 257-275. doi:10.1002/(SICI)1097-0355(199623)17:3<257::AID-IMHJ5>3.0.CO;2-L

Matthews, L. R. (2005). Work potential of road accident survivors with post-traumatic stress disorder. *Behaviour Research and Therapy, 43*(4), 475-483. doi:10.1016/j.brat.2004.03.008

Mauss, I. B., & Robinson, M. D. (2009). Measures of emotion: A review. *Cognition & Emotion, 23*(2), 209-237. doi:10.1080/02699930802204677

Mendlowicz, M., & Stein, M. (2000). Quality of life in individuals with anxiety disorders. *The American Journal of Psychiatry, 157*(5), 669-682.

Monson, E. (2012). Quality of Life and Social Support in Relation to Trauma and PTSD. In A. Brunet (Ed.): ProQuest Dissertations Publishing.

Moore, S. A., & Zoellner, L. A. (2012). The effects of expressive and experiential suppression on memory accuracy and memory distortion in women with and without PTSD. *Journal of experimental psychopathology, 3*(3), 368.

NICE. (2005). Post-traumatic stress disorder: management.

Nijenhuis, E. R. S., & Van Der Hart, O. (2011). Dissociation in Trauma: A New Definition and Comparison with Previous Formulations. *Journal of Trauma & Dissociation, 12*(4), 416-445. doi:10.1080/15299732.2011.570592

Norman, R., Matzopoulos, R., Groenewald, P., & Bradshaw, D. The high burden of injuries in South Africa. *Bulletin of the World Health Organization,, 85*(9), 695-702.

North, C. S., Tivis, L., McMillen, J. C., Pfefferbaum, B., Cox, J., Spitznagel, E. L., . . . Smith, E. M. (2002). Coping, functioning, and adjustment of rescue workers after the Oklahoma City bombing. *Journal of Traumatic Stress, 15*(3), 171-175. doi:10.1023/A:1015286909111

Ogle, C. M., Rubin, D. C., Berntsen, D., & Siegler, I. C. (2013). The Frequency and Impact of Exposure to Potentially Traumatic Events Over the Life Course. *Clinical Psychological Science, 1*(4), 426-434. doi:10.1177/2167702613485076

Oguntoye, A., & Bursztajn , H. J. (2009). Commentary: inadequacy of the categorical approach of the DSM for diagnosing female inmates with borderline personality disorder and/or PTSD. *Journal of the American Academy of Psychiatry and the Law Online, 37*(3), 306-309.

Olatunji, B. O., Cisler, J. M., & Tolin, D. F. (2007). Quality of life in the anxiety disorders: A meta-analytic review. *Clinical Psychology Review, 27*(5), 572-581. doi:10.1016/j.cpr.2007.01.015

Pagotto, L. F., Mendlowicz, M. V., Coutinho, E. S. F., Figueira, I., Luz, M. P., Araujo, A. X., & Berger, W. (2015). The impact of posttraumatic symptoms and comorbid mental disorders on the health-related quality of life in treatment-seeking PTSD patients. *Comprehensive Psychiatry, 58*, 68-73. doi:10.1016/j.comppsych.2015.01.002

Partala, T., & Surakka, V. (2003). Pupil size variation as an indication of affective processing. *International Journal of Human - Computer Studies, 59*(1), 185-198. doi:10.1016/S1071-5819(03)00017-X

Paulhus, D., & Reid, D. (1991). Enhancement and Denial in Socially Desirable Responding. *Journal of Personality and Social Psychology, 60*(2), 307.

Pedersen, D., Kienzler, H., & Gamarra, J. (2010). Llaki and ñakary: idioms of distress and suffering among the highland Quechua in the Peruvian Andes. *Culture, Medicine and Psychiatry, 34*(2), 279. doi:10.1007/s11013-010-9173-z

Powers, A., Etkin, A., Gyurak, A., Bradley, B., & Jovanovic, T. (2015). Associations Between Childhood Abuse, Posttraumatic Stress Disorder, and Implicit Emotion Regulation Deficits: Evidence From a Low-Income, Inner-City Population. *Psychiatry, 78*(3), 251-264. doi:10.1080/00332747.2015.1069656

Prehn, K., Kazzer, P., Lischke, A., Heinrichs, M., Herpertz, S. C., & Domes, G. (2013). Effects of intranasal oxytocin on pupil dilation indicate increased salience of socioaffective stimuli. *Psychophysiology, 50*(6), 528-537. doi:10.1111/psyp.12042

Priebe, J. A., Messingschlager, M., & Lautenbacher, S. (2015). Gaze behaviour when monitoring pain faces: An eye-tracking study. *European Journal of Pain, 19*(6), 817-825. doi:10.1002/ejp.608

Proverbio, A. M., Matarazzo, S., Brignone, V., Zotto, M. D., & Zani, A. (2007). Processing valence and intensity of infant expressions: The roles of expertise and gender. *Scandinavian Journal of Psychology, 48*(6), 477-485. doi:10.1111/j.1467-9450.2007.00616.x

Pupo, M. C., Serafim, P. M., & de Mello, M. F. (2015). Health-related quality of life in posttraumatic stress disorder: 4 years follow-up study of individuals exposed to urban violence. *Psychiatry Research, 228*(3), 741-745. doi:10.1016/j.psychres.2015.05.030

Radomski, S. A., & Read, J. P. (2016). Mechanistic Role of Emotion Regulation in the PTSD and Alcohol Association. *Traumatology*. doi:10.1037/trm0000068

Resnick, S. G., & Rosenheck, R. A. (2008). Posttraumatic stress disorder and employment in veterans participating in Veterans Health Administration Compensated Work Therapy. *Journal of rehabilitation research and development, 45*(3), 427.

Richards, J. M., & Gross, J. J. (2000). Emotion Regulation and Memory: The Cognitive Costs of Keeping One's Cool. *Journal of Personality and Social Psychology, 79*(3), 410-424. doi:10.1037/0022-3514.79.3.410

Riddle, J. R., Smith, T. C., Smith, B., Corbeil, T. E., Engel, C. C., Wells, T. S., . . . Blazer, D. (2007). Millennium Cohort: The 2001–2003 baseline prevalence of mental disorders in the U.S. military. *Journal of Clinical Epidemiology, 60*(2), 192-201. doi:10.1016/j.jclinepi.2006.04.008

Robinaugh, D. J., Marques, L., Traeger, L. N., Marks, E. H., Sung, S. C., Gayle Beck, J., . . . Simon, N. M. (2011). Understanding the relationship of perceived social support to post-trauma cognitions and posttraumatic stress disorder. *Journal of Anxiety Disorders, 25*(8), 1072-1078. doi:10.1016/j.janxdis.2011.07.004

Rosen, G. M. (1995). The Aleutian Enterprise Sinking and Posttraumatic Stress Disorder:: Misdiagnosis in Clinical and Forensic Settings. *Professional Psychology: Research and Practice, 26*(1), 82-87. doi:10.1037/0735-7028.26.1.82

Sachs, E., Rosenfeld, B., Lhewa, D., Rasmussen, A., & Keller, A. (2008). Entering exile: Trauma, mental health, and coping among Tibetan refugees arriving in Dharamsala, India. *Journal of Traumatic Stress, 21*(2), 199-208. doi:10.1002/jts.20324

Sack, M., Hopper, J. W., & Lamprecht, F. (2004). Low respiratory sinus arrhythmia and prolonged psychophysiological arousal in posttraumatic

stress disorder: heart rate dynamics and individual differences in arousal regulation. *Biological Psychiatry, 55*(3), 284-290. doi:10.1016/S0006-3223(03)00677-2

Savoca, E., & Rosenheck, R. (2000). The civilian labor market experiences of Vietnam-era veterans: the influence of psychiatric disorders. *Journal of Mental Health Policy and Economics, 3*(4), 199-207. doi:10.1002/mhp.102

Schechter, D. S., Moser, D. A., Reliford, A., McCaw, J. E., Coates, S. W., Turner, J. B., . . . Willheim, E. (2015). Negative and distorted attributions towards child, self, and primary attachment figure among posttraumatically stressed mothers: what changes with Clinician Assisted Videofeedback Exposure Sessions (CAVES). *Child psychiatry and human development, 46*(1), 10. doi:10.1007/s10578-014-0447-5

Schnurr, P. P., & Lunney, C. A. (2012). Work-related outcomes among female veterans and service members after treatment of posttraumatic stress disorder. *Psychiatric services (Washington, D.C.), 63*(11), 1072. doi:10.1176/appi.ps.201100415

Seedat, S., Nyamai, C., Njenga, F., Vythilingum, B., & Stein, D. J. (2004). Trauma exposure and post-traumatic stress symptoms in urban African schools. Survey in CapeTown and Nairobi. *The British journal of psychiatry : the journal of mental science, 184*, 169.

Seligowski, A. V., Lee, D. J., Bardeen, J. R., & Orcutt, H. K. (2015). Emotion regulation and posttraumatic stress symptoms: a meta-analysis. *Cognitive Behaviour Therapy, 44*(2), 87. doi:10.1080/16506073.2014.980753

Sepeta, L., Tsuchiya, N., Davies, M. S., Sigman, M., Bookheimer, S. Y., & Dapretto, M. (2012). Abnormal social reward processing in autism as indexed by pupillary responses to happy faces. *Journal of neurodevelopmental disorders, 4*(1), 17. doi:10.1186/1866-1955-4-17

Shamu, S., Abrahams, N., Temmerman, M., Musekiwa, A., & Zarowsky, C. (2011). A Systematic Review of African Studies on Intimate Partner Violence against Pregnant Women: Prevalence and Risk Factors (Intimate Partner Violence in Pregnancy in Africa). *PloS one, 6*(3), e17591. doi:10.1371/journal.pone.0017591

Sheehan, D. V., Lecrubier, Y., Sheehan, K. H., Amorim, P., Janavs, J., Weiller, E., . . . Dunbar, G. C. (1998). The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *The Journal of clinical psychiatry, 59 Suppl 20*, 22.

Shepherd, L., & Wild, J. (2014). Emotion regulation, physiological arousal and PTSD symptoms in trauma-exposed individuals. *Journal of Behavior Therapy and Experimental Psychiatry, 45*(3), 360-367. doi:10.1016/j.jbtep.2014.03.002

Sippel, L. M., Roy, A. M., Southwick, S. M., & Fichtenholtz, H. M. (2016). An examination of the roles of trauma exposure and posttraumatic stress disorder on emotion regulation strategies of Operation Iraqi Freedom, Operation Enduring Freedom, and Operation New Dawn veterans. *Cognitive Behaviour Therapy, 45*(5), 339-350. doi:10.1080/16506073.2016.1183037

Sirois, S., & Brisson, J. (2014). Pupillometry (Vol. 5, pp. 679-692). Hoboken, USA.
Sprague, D., Bogart, A., Manson, S., Buchwald, D., & Goldberg, J. (2010). The relationship between post-traumatic stress disorder, depression, and lung disorders in Northern Plains and Southwest American Indians. *Ethnicity &Health, 15*(6), 569-579. doi:10.1080/13557858.2010.500017
Stange, J., Hamilton, J., Fresco, D., & Alloy, L. (2017). Flexible parasympathetic responses to sadness facilitate spontaneous affect regulation. *Psychophysiology*.
Stein, D. J., Koenen, K. C., Friedman, M. J., Hill, E., McLaughlin, K. A., Petukhova, M., . . . Kessler, R. C. (2012). Dissociation in Posttraumatic Stress Disorder: Evidence from the World Mental Health Surveys. *Biological Psychiatry*. doi:10.1016/j.biopsych.2012.08.022
Stein, M., Walker, J., Hazen, A., & Forde, D. (1997). Full and partial posttraumatic stress disorder: Findings from a community survey. *The American Journal of Psychiatry, 154*(8), 1114-1119.
Stein, M. B., McQuaid, J. R., Pedrelli, P., Lenox, R., & McCahill, M. E. (2000). Posttraumatic stress disorder in the primary care medical setting. *General Hospital Psychiatry, 22*(4), 261-269. doi:10.1016/S0163-8343(00)00080-3
Steinhauer, S. R., Siegle, G. J., Condray, R., & Pless, M. (2004). Sympathetic and parasympathetic innervation of pupillary dilation during sustained processing. *International Journal of Psychophysiology, 52*(1), 77-86. doi:10.1016/j.ijpsycho.2003.12.005
Tager-Flusberg, H., & Kasari, C. (2013). Minimally Verbal School-Aged Children with Autism Spectrum Disorder: The Neglected End of the Spectrum (Vol. 6, pp. 468-478).
Tan, G., Dao, T. K., Farmer, L., Sutherland, R. J., & Gevirtz, R. (2011). Heart rate variability (HRV) and posttraumatic stress disorder (PTSD): a pilot study. *Applied psychophysiology and biofeedback, 36*(1), 27. doi:10.1007/s10484-010-9141-y
The National Institute for Health and Care Excellence (NICE). (2005). Post-traumatic stress disorder: management.
Tolin, D. F., & Foa, E. B. (2006). Sex Differences in Trauma and Posttraumatic Stress Disorder: A Quantitative Review of 25 Years of Research. *Psychological Bulletin, 132*(6), 959-992.
Topper, K., van Rooyen, K., Grobler, C., van Rooyen, D., & Andersson, L. M. C. (2015). Posttraumatic Stress Disorder and Barriers to Care in Eastern Cape Province, South Africa. *Journal of Traumatic Stress, 28*(4), 375-379. doi:10.1002/jts.22032
Trickey, D., Siddaway, A. P., Meiser-Stedman, R., Serpell, L., & Field, A. P. (2011). A meta-analysis of risk factors for post-traumatic stress disorder in children and adolescents. *Clinical Psychology Review, 32*(2), 122-138. doi:10.1016/j.cpr.2011.12.001
Tull, M. T., Gratz, K. L., McDermott, M. J., Bordieri, M. J., Daughters, S. B., & Lejuez, C. W. (2016). The Role of Emotion Regulation Difficulties in the Relation Between PTSD Symptoms and the Learned Association Between Trauma-Related and Cocaine Cues. *Substance use & misuse, 51*(10), 1318. doi:10.3109/10826084.2016.1168445
Vujanovic, A., Bonn-Miller, M., Potter, C., Marshall, E., & Zvolensky, M. (2011). An

Evaluation of the Relation Between Distress Tolerance and Posttraumatic Stress within a Trauma-Exposed Sample. *Journal of Psychopathology and Behavioral Assessment, 33*(1), 129-135. doi:10.1007/s10862-010-9209-2

Wald, J. (2009). Work limitations in employed persons seeking treatment for chronic posttraumatic stress disorder. *Journal of Traumatic Stress, 22*(4), 312-315. doi:10.1002/jts.20430

Walker, E. A., Katon, W., Russo, J., Ciechanowski, P., Newman, E., & Wagner, A. W. (2003). Health care costs associated with posttraumatic stress disorder symptoms in women. *Archives of general psychiatry, 60*(4), 369.

Wang, Y., Zekveld, A., Naylor, G., Ohlenforst, B., Jansma, E. P., Lorens, A., . . . Kramer, S. E. (2016). Parasympathetic Nervous System Dysfunction, as Identified by Pupil Light Reflex, and Its Possible Connection to Hearing Impairment. *PloS one, 11*(4), e0153566. doi:10.1371/journal.pone.0153566

Warren, J. I., Loper, A. B., & Komarovskaya, I. (2009). Symptom patterns related to traumatic exposure among female inmates with and without a diagnosis of posttraumatic stress disorder. *Journal of the American Academy of Psychiatry and the Law, 37*(3), 294-305.

Weathers, F. W., Keane, T. M., & Davidson, J. R. T. (2001). Clinician-administered PTSD scale: A review of the first ten years of research. *Depression and Anxiety, 13*(3), 132-156. doi:10.1002/da.1029

Webb, A. K., Vincent, A. L., Jin, A. B., & Pollack, M. H. (2015). Physiological reactivity to nonideographic virtual reality stimuli in veterans with and without PTSD. *Brain and Behavior, 5*(2). doi:10.1002/brb3.304

Weiss, N. H., Tull, M. T., Davis, L. T., Dehon, E. E., Fulton, J. J., & Gratz, K. L. (2012). Examining the Association Between Emotion Regulation Difficulties and Probable Posttraumatic Stress Disorder Within a Sample of African Americans. *Cognitive Behaviour Therapy, 41*(1), 5-14. doi:10.1080/16506073.2011.621970

Westhuizen, C., Wyatt, G., Williams, J. K., Stein, D. J., & Sorsdahl, K. (2016). Validation of the Alcohol, Smoking and Substance Involvement Screening Test in a low- and middle-income country cross-sectional emergency centre study. *Drug and Alcohol Review, 35*(6), 702-709. doi:10.1111/dar.12424

Westphal, M., Olfson, M., Gameroff, M. J., Wickramaratne, P., Pilowsky, D. J., Neugebauer, R., . . . Neria, Y. (2011). Functional impairment in adults with past posttraumatic stress disorder: findings from primary care. *Depression and Anxiety, 28*(8), 686-695. doi:10.1002/da.20842

WHO. (2002). The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): development, reliability and feasibility. *Addiction, 97*(9), 1183-1194. doi:10.1046/j.1360-0443.2002.00185.x

WHO. (2013). *Guidelines for the management of conditions that are specifically related to stress*. Geneva: WHO.

Wilhelm, H., & Wilhelm, B. (2003). Clinical applications of pupillography. *Journal of neuro-ophthalmology : the official journal of the North American Neuro-Ophthalmology Society, 23*(1), 42.

Williams, S. L., Williams, D. R., Stein, D. J., Seedat, S., Jackson, P. B., & Moomal, H. (2007). Multiple traumatic events and psychological distress: the South

Africa stress and health study. *Journal of Traumatic Stress, 20*(5), 845.
Woodward, M. J., Eddinger, J., Henschel, A. V., Dodson, T. S., Tran, H. N., & Beck, J. G. (2015). Social support, posttraumatic cognitions, and PTSD: The influence of family, friends, and a close other in an interpersonal and non-interpersonal trauma group. *Journal of Anxiety Disorders, 35*, 60-67. doi:10.1016/j.janxdis.2015.09.002
World Health Organization (WHO). (2013). *Guidelines for the management of conditions that are specifically related to stress*. Geneva: WHO.
Xiong, K., Zhang, Y., Qiu, M., Zhang, J., Sang, L., Wang, L., . . . Li, M. (2013). Negative emotion regulation in patients with posttraumatic stress disorder. *PloS one, 8*(12), e81957. doi:10.1371/journal.pone.0081957
Yehuda, R., Bell, A., Bierer, L. M., & Schmeidler, J. (2008). Maternal, not paternal, PTSD is related to increased risk for PTSD in offspring of Holocaust survivors. *Journal of Psychiatric Research, 42*(13), 1104-1111. doi:10.1016/j.jpsychires.2008.01.002
Yehuda, R., Schmeidler, J., Wainberg, M., Binder-Brynes, K., & Duvdevani, T. (1998). Vulnerability to posttraumatic stress disorder in adult offspring of holocaust survivors. *The American Journal of Psychiatry, 155*(9), 1163-1171. doi:10.1176/ajp.155.9.1163
Yrttiaho, S., Niehaus, D., Thomas, E., & Leppänen, J. M. (2017). Mothers' pupillary responses to infant facial expressions. *Behavioral and Brain Functions, 13*(1), 2. doi:10.1186/s12993-017-0120-9
Zalta, A. K., Gillihan, S. J., Fisher, A. J., Mintz, J., McLean, C. P., Yehuda, R., & Foa, E. B. (2014). Change in Negative Cognitions Associated With PTSD Predicts Symptom Reduction in Prolonged Exposure. *Journal of Consulting and Clinical Psychology, 82*(1), 171-175. doi:10.1037/a0034735
Zang, Y., Gallagher, T., McLean, C. P., Tannahill, H. S., Yarvis, J. S., & Foa, E. B. (2017). The impact of social support, unit cohesion, and trait resilience on PTSD in treatment-seeking military personnel with PTSD: The role of posttraumatic cognitions. *Journal of Psychiatric Research, 86*, 18-25. doi:10.1016/j.jpsychires.2016.11.005
Zar, H. J., Barnett, W., Myer, L., Stein, D. J., & Nicol, M. P. (2015). Investigating the early-life determinants of illness in Africa: the Drakenstein Child Health Study. *Thorax, 70*(6), 592. doi:10.1136/thoraxjnl-2014-206242
Zhang, Y., & Ho, S. M. Y. (2011). Risk factors of posttraumatic stress disorder among survivors after the 512 wenchuan earthquake in China. *PloS one, 6*(7), e22371.
Zimmerli, M., Tisljar, K., Balestra, G.-M., Langewitz, W., Marsch, S., & Hunziker, S. (2014). Prevalence and risk factors for post-traumatic stress disorder in relatives of out-of-hospital cardiac arrest patients. *Resuscitation, 85*(6), 801-808. doi:10.1016/j.resuscitation.2014.02.022
Zucker, T. L., Samuelson, K. W., Muench, F., Greenberg, M. A., & Gevirtz, R. N. (2009). The effects of respiratory sinus arrhythmia biofeedback on heart rate variability and posttraumatic stress disorder symptoms: a pilot study. *Applied psychophysiology and biofeedback, 34*(2), 135. doi:10.1007/s10484-009-9085-2

APPENDIX A
Difficulties in Emotional Regulation Scale in English, Afrikaans, and isiXhosa

Confidential

Difficulties Emotional Regulation Scale 2

Child PID _____

CRF completion date _____

What language will this questionaire be administered in?
- ○ English
- ○ Afrikaans
- ○ Xhosa

Please indicate how often the following statements apply to you by writing the appropriate number from the scale below on the line beside each item.

	1 almost never (0-10%)	2 sometimes (11-35%)	3 about half the time (36-65%)	4 most of the time (66-90%)	5 almost always (91-100%)
Q1. I am clear about my feelings.	○	○	○	○	○
Q2. I pay attention to how I feel.	○	○	○	○	○
Q3. I experience my emotions as overwhelming and out of control.	○	○	○	○	○
Q4. I have no idea how I am feeling.	○	○	○	○	○
Q5. I have difficulty making sense out of my feelings.	○	○	○	○	○
Q6. I am attentive to my feelings.	○	○	○	○	○

	1 almost never (0-10%)	2 sometimes (11-35%)	3 about half the time (36-65%)	4 most of the time (66-90%)	5 almost always (91-100%)
Q7. I know exactly how I am feeling.	○	○	○	○	○
Q8. I care about what I am feeling.	○	○	○	○	○
Q9. I am confused about how I feel.	○	○	○	○	○
Q10. When I'm upset, I acknowledge my emotions.	○	○	○	○	○
Q11. When I'm upset, I become angry with myself for feeling that way.	○	○	○	○	○
Q12. When I'm upset, I become embarrassed for feeling that way.	○	○	○	○	○
Q13. When I'm upset, I have difficulty getting work done.	○	○	○	○	○

Confidential

Q14. When I'm upset, I become out of control.	○	○	○	○	○
	1 almost never (0-10%)	2 sometimes (11-35%)	3 about half the time (36-65%)	4 most of the time (66-90%)	5 almost always (91-100%)
Q15. When I'm upset, I believe that I will remain that way for a long time.	○	○	○	○	○
Q16. When I'm upset, I believe that I will end up feeling very depressed.	○	○	○	○	○
Q17. When I'm upset, I believe that my feelings are valid and important.	○	○	○	○	○
Q18. When I'm upset, I have difficulty focusing on other things.	○	○	○	○	○
Q19. When I'm upset, I feel out of control.	○	○	○	○	○
Q20. When I'm upset, I can still get things done.	○	○	○	○	○
Q21. When I'm upset, I feel ashamed at myself for feeling that way.	○	○	○	○	○
	1 almost never (0-10%)	2 sometimes (11-35%)	3 about half the time (36-65%)	4 most of the time (66-90%)	5 almost always (91-100%)
Q22. When I'm upset, I know that I can find a way to eventually feel better.	○	○	○	○	○
Q23. When I'm upset, I feel like I am weak.	○	○	○	○	○
Q24. When I'm upset, I feel like I can remain in control of my behaviors.	○	○	○	○	○
Q25. When I'm upset, I feel guilty for feeling that way.	○	○	○	○	○
Q26. When I'm upset, I have difficulty concentrating.	○	○	○	○	○
Q27. When I'm upset, I have difficulty controlling my behaviors.	○	○	○	○	○
Q28. When I'm upset, I believe there is nothing I can do to make myself feel better.	○	○	○	○	○

Confidential

	1 almost never (0-10%)	2 sometimes (11-35%)	3 about half the time (36-65%)	4 most of the time (66-90%)	5 almost always (91-100%)
Q29. When I'm upset, I become irritated at myself for feeling that way.	○	○	○	○	○
Q30. When I'm upset, I start to feel very bad about myself.	○	○	○	○	○
Q31. When I'm upset, I believe that wallowing in it is all I can do.	○	○	○	○	○
Q32. When I'm upset, I lose control over my behavior.	○	○	○	○	○
Q33. When I'm upset, I have difficulty thinking about anything else.	○	○	○	○	○
Q34. When I'm upset I take time to figure out what I	○	○	○	○	○
Q35. When I'm upset, it takes me a long time to feel better.	○	○	○	○	○
Q36. When I'm upset, my emotions feel overwhelming.	○	○	○	○	○

Dui asseblief aan hoe dikwels die volgende stellings op u van toepassing is deur die toepaslike nommer neer te skryf van die skaal onderstaande langs elke item.

	1 byna nooit (0-10%)	2 soms (11-35%)	3 omtrent helfte van die tyd (36-65%)	4 meeste van die tyd (66-90%)	5 byna altyd (91-100%)
Q1. Ek verstaan my emosies.	○	○	○	○	○
Q2. Ek gee aandag aan hoe ek voel.	○	○	○	○	○
Q3. Ek ervaar my emosies as oorweldigend en buite beheer.	○	○	○	○	○
Q4. Ek het geen idee hoe ek voel nie.	○	○	○	○	○
Q5. Ek sukkel om sin te maak uit my gevoelens.	○	○	○	○	○
Q6. Ek is oplettend oor my gevoelens.	○	○	○	○	○

Confidential

	1 byna nooit (0-10%)	2 soms (11-35%)	3 omtrent helfte van die tyd (36-65%)	4 meeste van die tyd (66-90%)	5 byna altyd (91-100%)
Q7. Ek weet presies hoe ek voel.	○	○	○	○	○
Q8. Ek gee om oor wat ek voel.	○	○	○	○	○
Q9. Ek is verward oor hoe ek voel.	○	○	○	○	○
Q10. Wanneer ek ontsteld is, erken ek my emosies.	○	○	○	○	○
Q11. Wanneer ek ontsteld is, raak ek kwaad vir myself om te voel soos wat ek voel.	○	○	○	○	○
Q12. Wanneer ek ontsteld is, raak ek skaam vir die manier hoe ek voel.	○	○	○	○	○
Q13. Wanneer ek ontsteld is, sukkel ek om werk klaar te maak.	○	○	○	○	○

| | 1 byna nooit (0-10%) | 2 soms (11-35%) | 3 omtrent helfte van die tyd (36-65%) | 4 meeste van die tyd (66-90%) | 5 byna altyd (91-100%) |

Q14. Wanneer ek ontsteld is, raak ek buite beheer.	○	○	○	○	○
Q15. Wanneer ek ontsteld is, glo ek dat ek vir 'n lang tyd so sal voel.	○	○	○	○	○
Q16. Wanneer ek ontsteld is, glo ek dat ek baie depressief sal opeindig.	○	○	○	○	○
Q17. Wanneer ek ontsteld is, ek glo dat my gevoelens is geldig en belangrik.	○	○	○	○	○
Q18. Wanneer ek ontsteld is, sukkel ek om op ander dinge te fokus.	○	○	○	○	○
Q19. Wanneer ek ontsteld is, voel ek buite beheer.	○	○	○	○	○
Q20. Wanneer ek ontsteld is, kan ek nog steeds dinge gedoen kry.	○	○	○	○	○
Q21. Wanneer ek ontsteld is, voel ek skaam vir myself om so te voel.	○	○	○	○	○

Confidential

	1 byna nooit (0-10%)	2 soms (11-35%)	3 omtrent helfte van die tyd (36-65%)	4 meeste van die tyd (66-90%)	5 byna altyd (91-100%)
Q22. Wanneer ek onsteld is, weet ek dat ek mettertyd	○	○	○	○	○
Q23. Wanneer ek onsteld is, voel ek baie swak.	○	○	○	○	○
Q24. Wanneer ek onsteld is, voel ek, ek kan in beheer bly van my gedrag.	○	○	○	○	○
Q25. Wanneer ek onsteld is, voel ek skuldig om so te voel.	○	○	○	○	○
Q26. Wanneer ek onsteld is, is dit vir my moeilik om te konsentreer.	○	○	○	○	○
Q27. Wanneer ek onsteld is, is dit vir my moeilik om my gedrag te beheer.	○	○	○	○	○
Q28. Wanneer ek onsteld is, voel ek daar is niks wat ek kan doen om myself beter te laat voel nie.	○	○	○	○	○
Q29. Wanneer ek onsteld is, begin ek ge	○	○	○	○	○
Q30. Wanneer ek onsteld is, begin ek baie sleg te voel oor myself.	○	○	○	○	○

	1 byna nooit (0-10%)	2 soms (11-35%)	3 omtrent helfte van die tyd (36-65%)	4 meeste van die tyd (66-90%)	5 byna altyd (91-100%)
Q31. Wanneer ek onsteld is, voel ek al wat ek kan doen is om heeltyd rond te dwaal.	○	○	○	○	○
Q32. Wanneer ek onsteld is, voel ek, ek verloor beheer oor my gedrag.	○	○	○	○	○
Q33. Wanneer ek onsteld is, voel ek dis moeilik om aan enige iets anders te dink.	○	○	○	○	○
Q34. Wanneer ek onsteld is, neem ek _ tydjie om uit te vind hoe ek regtig voel.	○	○	○	○	○
Q35. Wanneer ek onsteld is, neem dit _ lang tyd voor ek beter voel.	○	○	○	○	○

Confidential

Q36. Wanneer ek onsteld is, voel ek my emosies raak oorweldigend.	○	○	○	○	○

Nceda ubonise ukuba kukangaphi ezi zivakalisi zilandelayo zibhekisela kuwe ngokuthi ubhale inani elifanelekileyo elivela kwisikali esingezantsi ecaleni kwenqaku ngalinye.

	1 phantse zange (0-10%)	2 ngamaxesha athile (11-35%)	3 ngangesiqingatha sexesha (36-65%)	4 ixesha elininzi (66-90%)	5 phantse rhoqo (91-100%)
Q1. Ndicacelwe ngeemvakalelo zam.	○	○	○	○	○
Q2. Ndizinika ingqalelo iimvakalelo zam.	○	○	○	○	○
Q3. Ndiye ndive iimvakalelo zam zindisinda kwaye zingalawuleki.	○	○	○	○	○
Q4. Andizazi ndiziva njani.	○	○	○	○	○
Q5. Kunzima kum ukuqonda kakuhle indlela endiziva ngayo.	○	○	○	○	○
Q6. Ndiyazihoya iimvakalelo zam	○	○	○	○	○
Q7. Ndiyazi kakuhle indlela endivakalelwa//endiziva ngayo.	○	○	○	○	○

	1 phantse zange (0-10%)	2 ngamaxesha athile (11-35%)	3 ngangesiqingatha sexesha (36-65%)	4 ixesha elininzi (66-90%)	5 phantse rhoqo (91-100%)
Q8. Ndiyikhathalele indlela endivakalelwa//endiziva ngayo.	○	○	○	○	○
Q9. Ndididekile yindlela endivakalelwa/endiziva ngayo.	○	○	○	○	○
Q10. Xa ndinomsindo, ndiyazamkela iimvakalelo zam.	○	○	○	○	○
Q11. Xa ndinomsindo, ndiba nomsindo kum ngendlela endiziva ngayo	○	○	○	○	○
Q12. Xa ndinomsindo, ndiba nentloni ngendlela endiziva ngayo.	○	○	○	○	○
Q13. Xa ndinomsindo, ndiye ndinzinyelwe kukwenza umsenzi ndiwugqibe.	○	○	○	○	○
Q14. Xa ndinomsindo, ndiye ndingalawuleki.	○	○	○	○	○

Confidential

	1 phantse zange (0-10%)	2 ngamaxesha athile (11-35%)	3 ngangesiqingatha sexesha (36-65%)	4 ixesha elininzi (66-90%)	5 phantse rhoqo (91-100%)
Q15. Xa ndinomsindo, ndikholelwa kukuba ndiyakuhlala ndinjalo ixesha elide.	○	○	○	○	○
Q16. Xa ndinomsindo, ndiye ndikholelwe kukuba ndizade ndizive ndidakumbile.	○	○	○	○	○
Q17. Xa ndinomsindo, ndiye ndikholelwe kukuba iimvakalelo zam zifanelekile kwaye zibalulekile.	○	○	○	○	○
Q18. Xa ndinomsindo, kunzima kum ukunikela ingqalelo kwezinye izinto.	○	○	○	○	○
Q19. Xa ndinomsindo, ndiye ndizive ndingakwazi ukuzilawula.	○	○	○	○	○
Q20. Xa ndinomsindo, ndisenako ukwenza izinto ndizigqibe.	○	○	○	○	○
Q21. Xa ndinomsindo, ndiziva ndihlazekile ngendlela endiziva ngayo.	○	○	○	○	○
Q22. Xa ndinomsindo, ndiyazi ukuba ekugqibeleni ndizofumana indlela yokwenza ndizive ndibhetele.	○	○	○	○	○
Q23. Xa ndinomsindo, ndiziva ingathi ndibuthathaka.	○	○	○	○	○

Confidential

	1 phantse zange (0-10%)	2 ngamaxesha athile (11-35%)	3 ngangesiqingatha sexesha (36-65%)	4 ixesha elininzi (66-90%)	5 phantse rhoqo (91-100%)
Q24. Xa ndinomsindo, ndivakalelwa kukuba ndinako ukulawula indlela endiziphatha ngayo.	○	○	○	○	○
Q25. Xa ndinomsindo, ndiye ndizive ndinesazela ngendlela endiziva ngayo.	○	○	○	○	○
Q26. Xa ndinomsindo, kuye kube nzima ukunikela ingqalelo.	○	○	○	○	○
Q27. Xa ndinomsindo, kuba nzima ukulawula indlela endiziphatha ngayo.	○	○	○	○	○
Q28. Xa ndinomsindo, ndiye ndivakalelwe kukuba akukho nto endinokuyenza ukuze ndizive ndibhetele.	○	○	○	○	○
Q29. Xa ndinomsindo, ndiye ndizive indidika indlela endiziva ngayo.	○	○	○	○	○
Q30. Xa ndinomsindo, ndiye ndiqalise ukuvakalelwa/ukuziva kakubi ngam.	○	○	○	○	○

	1 phantse zange (0-10%)	2 ngamaxesha athile (11-35%)	3 ngangesiqingatha sexesha (36-65%)	4 ixesha elininzi (66-90%)	5 phantse rhoqo (91-100%)
Q31. Xa ndinomsindo, ndiye ndikholelwe kukuba kokuphela kwento endinoyenza kukuzisizela.	○	○	○	○	○
Q32. Xa ndinomsindo, ndiye ndohluleke ukulawula indlela endiziphatha ngayo.	○	○	○	○	○
Q33. Xa ndinomsindo, kuye kubenzima kum ukucinga ngenye into.	○	○	○	○	○
Q34. Xa ndinomsindo, ndiye ndithathe ixesha ukufumanisa eyona ndlela endiziva ngayo.	○	○	○	○	○
Q35. Xa ndinomsindo, kuthatha ixesha elide ukuze ndizive ndibetele.	○	○	○	○	○
Q36. Xa ndinomsindo, iimvakalelo za ziye zindisinde.	○	○	○	○	○

APPE

APPENDIX B

Emotional Regulation Questionnaire in English, Afrikaans, and isiXhosa

Confidential

Emotional Regulation Questionnaire

Child PID _____

CRF completion date _____

In what language will this questionnaire be administered?
- ◯ English
- ◯ Afrikaans
- ◯ Xhosa

We would like to ask you some questions about your emotional life, in particular, how you control (that is, regulate and manage) your emotions. The following questions involve two distinct aspects of your emotional life. One is your EMOTIONAL EXPERIENCE, or what you feel like inside. The other is your EMOTIONAL EXPRESSION, or how you show your emotions in the way you talk, gesture, or behave. Although some of the following questions may seem similar to one another, they differ in important ways. For each item, please answer using the following scale:

	1 Strongly disagree	2	3	Neutral	5	6	Strongly agree
Q1. When I want to feel more positive emotion (such as joy or amusement), I change what I'm thinking about	◯	◯	◯	◯	◯	◯	◯
Q2. I keep my emotions to myself	◯	◯	◯	◯	◯	◯	◯
Q3. When I want to feel less negative emotion (such as sadness or anger), I change what I'm thinking about	◯	◯	◯	◯	◯	◯	◯
Q4. When I am feeling positive emotions, I am careful not to express them	◯	◯	◯	◯	◯	◯	◯
Q5. When I'm faced with a stressful situation, I make myself think about it in a way that helps me stay calm	◯	◯	◯	◯	◯	◯	◯
Q6. I control my emotions by not expressing them	◯	◯	◯	◯	◯	◯	◯
Q7. When I want to feel more positive emotion, I change the way I'm thinking about the situation	◯	◯	◯	◯	◯	◯	◯

Confidential

Q8. I control my emotions by changing the way I think about the situation I'm in	○	○	○	○	○	○	○
Q9. When I am feeling negative emotions, I make sure not to express them	○	○	○	○	○	○	○
Q10. When I want to feel less negative emotion, I change the way I'm thinking about the situation	○	○	○	○	○	○	○

Ons wil jou graag 'n paar vrae oor jou emosionele lewe vra. In besonder, hoe beheer jy (dit is, reguleer en bestuur) jou emosies. Die onderstaande vrae behels twee duidelike aspekte van jou emosionele lewe. Een is jou EMOSIONELE ERVARING, of wat jy binne voel. Die ander is jou EMOSIONELE UITDRUKKING, of hoe jy jou emosies wys in die manier waarop jy praat, gebare, of optrede. Alhoewel sommige van die volgende vrae soortgelyk aan mekaar mag lyk, verskil hulle in belangrike maniere. Vir elke item, beantwoord asseblief met die gebruik van die volgende skaal:

	1 Verskil sterk	2	3	4 Neutraal	5	6	7 Stem beslis saam
Q1. Wanneer ek 'n meer positiewe emosie wil ervaar (soos blydskap of vermaak), verander ek waaraan ek dink	○	○	○	○	○	○	○
Q2. Ek hou my emosies vir myself	○	○	○	○	○	○	○
Q3. Wanneer ek minder negatiewe emosie wil ervaar (soos hartseer of woede), verander ek waaraan ek dink	○	○	○	○	○	○	○
Q4. Wanneer ek positiewe emosies ervaar, is ek versigtig om dit nie te wys nie	○	○	○	○	○	○	○
Q5. Wanneer ek gekonfronteer word met 'n stresvolle situasie, maak ek myself dink daaroor op 'n manier wat my help om kalm te bly	○	○	○	○	○	○	○
Q6. Ek beheer my emosies deur hulle nie uit te druk nie	○	○	○	○	○	○	○
Q7. Wanneer ek 'n meer positiewe emosie wil voel, verander ek die manier waarop ek dink oor die situasie	○	○	○	○	○	○	○

Confidential

Q8. Ek beheer my emosies deur op 'n ander manier te dink oor die situasie waarin ek my bevind	○	○	○	○	○	○	○
Q9. Wanneer ek negatiewe emosies ervaar , maak ek seker om dit nie te wys nie	○	○	○	○	○	○	○
Q10. Wanneer ek 'n minder negatiewe emosie wil ervaar, verander ek die manier hoe ek oor die situasie dink	○	○	○	○	○	○	○

Confidential

Singathanda ukukubuza imibuzo malunga nobomi bakho ngokweemvakalelo zangaphakathi, ingakumbi indlela ozilawula (oku kukuthi, ukuzilinganisela nokuzilawula) ngayo iimvakalelo zakho zangaphakathi. Imibuzo esezantsi ibandakanya iinkalo ezimbini ezahlukileyo ngokuphathelele ubomi bakho ngokweemvakalelo. Eyokuqala ngamava onawo ngeemvakalelo zangaphakathi, okanye indlela ovakalelwa ngayo ngaphakathi. Enye yindlela ozibonakalisa nokuziveza ngayo ezomvakalelo zangaphakathi okanye indlela ozibonakalisa ngayo iimvakalelo zakho ngothetha, izimbo zomzimba, okanye indlela oziphatha ngayo. Nakubeni eminye kulemibuzo ilandelayo isenokubonakala ifana, ibalulekile ngendlela ezahlukileyo. Kwinkcazelo nganye sicela usebenzise esisikali okanye umlinganiselo olandelayo xa uphendula:

	1 Andivumelani konke konke	2	3	4 Andiqinisekanga	5	6	7 Ndivumelana ngamandla
Q1. Xa ndifuna ukuvakalelwa kakuhle (njengokuvuya okanye ukonwaba), nditshintsha oko ndikucingayo	○	○	○	○	○	○	○
Q2. Iimvakalelo zam ndizigcina ngaphakathi	○	○	○	○	○	○	○
Q3. Xa ndifuna ukuvakalelwa ngendlela engekhombi kangako (njengokubalusizi okanye nomsindo), nditshintsha oko ndikucingayo	○	○	○	○	○	○	○
Q4. Xa ndiziva ndineemvakalelo ezintle, ndiye ndikulumkele ukuba ndingazibonakalisi	○	○	○	○	○	○	○
Q5. Xa ndijamelene nemeko enoxinezeleko, ndiye ndizenze ndicinge ngayo ngendlela endinceda ndihlale ndizolile	○	○	○	○	○	○	○
Q6. Ndilawula iimvakalelo zam zangaphakathi ngokuthi ndingazibonisi	○	○	○	○	○	○	○
Q7. Xa ndifuna ukuziva ndineemvakalelo zangaphakathi ezintle ngakumbi, nditshintsha indlela endicinga ngayo ngaloomeko	○	○	○	○	○	○	○

Confidential

Q8. Ndilawula iimvakalelo zam zangaphakathi ngokuthi nditshintshe indlela endicinga ngayo ngemeko leyo endikuyo	○	○	○	○	○	○	○
Q9. Xa ndiziva ndineemvakalelo ezimbi, ndiye ndiqinisekise ukuba andizibonakalisi	○	○	○	○	○	○	○
Q10. Xa ndifuna ukuvakalelwa ngendlela engekhombi kangako, nditshintsha indlela endicinga ngayo ngaloomeko	○	○	○	○	○	○	○

APPENDIX C
Intimate Partner Violence Questionnaire in English, Afrikaans, and isiXhosa

Confidential

Ps Ipv

Child PID _____

Date completed _____
(DD-MM-YYYY)

What language will this questionaire be administered in?
- ◯ English
- ◯ Afrikaans
- ◯ Xhosa

In any relationship there are good times and bad times. This questionnaire asks you about some of the bad times you might have had in relationships because we want to learn more about what women experience in their lives. There are no right or wrong answers and anything you say will be kept strictly confidential. Your husband/partner will not be informed that we have asked you these specific questions about your relationship. He will not be asked these same questions, and will not see any of your answers to these questions. Any conversations you might want to have with a study staff member after you have completed this questionnaire - now or at a future clinic visit - will be private.

Q1. Has your husband or boyfriend ever insulted you or made you feel bad about yourself? Did this happen many times, a few times, once, or did it not happen?
- ◯ Never
- ◯ Once
- ◯ Few
- ◯ Many

Q2. Has your husband or boyfriend ever belittled or humiliated you in front of other people? Did this happen many times, a few times, once, or did it not happen?
- ◯ Never
- ◯ Once
- ◯ Few
- ◯ Many

Q3. Has your husband or boyfriend ever done things to scare or intimidate you on purpose for example by the way he looked at you, by yelling and smashing things? Did this happen many times, a few times, once, or did it not happen?
- ◯ Never
- ◯ Once
- ◯ Few
- ◯ Many

Q4. Has your husband or boyfriend ever threatened to hurt you? Did this happen many times, a few times, once, or did it not happen?
- ◯ Never
- ◯ Once
- ◯ Few
- ◯ Many

Q5. Have any of these things happened in the past 12 months?
- ◯ Yes
- ◯ No

Q6. Has your husband or boyfriend ever slapped you or thrown something at you which could hurt you? Did this happen many times, a few times, once, or did it not happen?
- ◯ Never
- ◯ Once
- ◯ Few
- ◯ Many

Q7. Has your husband or boyfriend ever pushed or shoved you? Did this happen many times, a few times, once, or did it not happen?
- ◯ Never
- ◯ Once
- ◯ Few
- ◯ Many

Confidential

Q8. Has your husband or boyfriend ever hit you with a fist or with something else which could hurt you? Did this happen many times, a few times, once, or did it not happen?	◯ Never ◯ Once ◯ Few ◯ Many
Q9. Has your husband or boyfriend ever kicked, dragged, beaten, choked or burnt you? Did this happen many times, a few times, once, or did it not happen?	◯ Never ◯ Once ◯ Few ◯ Many
Q10. Has your husband or boyfriend ever threatened to use or actually used a gun, knife or other weapon against you?Did this happen many times, a few times, once or did it not happen?	◯ Never ◯ Once ◯ Few ◯ Many
Q11. Have any of these things happened in the past 12 months?	◯ Yes ◯ No
Q12. Has your husband or boyfriend ever physically forced you to have sex when you did not want to? Did this happen many times, a few times, once, or did it not happen?	◯ Never ◯ Once ◯ Few ◯ Many
Q13. Have you ever had sex with your husband or boyfriend when you did not want to because you were afraid of what he might do? Did this happen many times, a few times, once, or did it not happen?	◯ Never ◯ Once ◯ Few ◯ Many
Q14. Has your husband or boyfriend ever forced you to do something sexual that you found degrading or humiliating?	◯ Never ◯ Once ◯ Few ◯ Many
Q15. Have any of these things happened in the past 12 months?	◯ Yes ◯ No
Q16. This questionnaire has asked you about many difficult things. How has answering these questions made you feel?	◯ Good/better ◯ Bad/worse ◯ Same/no difference
Q17. Do you have any comments, or is there anything else you would like to add?	_____

We know these were difficult questions to answer, but it is only by hearing from women themselves that we can really understand about their health and experiences of intimate partner violence. Thank you for helping us, and for taking the time to complete this questionnaire. A study staff member will be providing you with a list of organisations that provide support, legal advice and counselling services to women in your area. You can take the information home with you, or leave it at the clinic if you prefer. Please do contact these services if you would like to talk with anyone about your situation. The services are free, and they will keep anything that you say to them private.

Alle verhoudings gaan deur goeie en slegte tye. Hierdie vraelys wil by jou uitvind oor party slegte tye wat jy dalk in verhoudings beleef het, want ons wil graag leer oor dinge wat vroue in die lewe ervaar. Daar is geen regte of verkeerde antwoorde nie, en ons sal alle inligting wat jy gee vertroulik hou. Ons sal nie vir jou man/mansvriend vertel dat ons hierdie besondere vrae oor julle verhouding aan jou gevra het nie. Ons sal nie vir hom dieselfde vrae vra nie, en ons sal geeneen van jou antwoorde op hierdie vrae vir hom wys nie. As jy enige iets met 'n lid van die studiespan wil bespreek nadat jy die vraelys ingevul het, sal dit privaat gehou word. Jy kan dit nou doen, of later weer kliniek toe kom.

Confidential

Q1. Het jou huidige of vorige seksmaat (byvoorbeeld jou man, eksman, mansvriend of vorige mansvriend) jou al ooit beledig of jou sleg oor jouself laat voel?
Het dit baie gebeur, n paar keer of net een keer, of glad nie?

- ◯ Nooit
- ◯ Een keer
- ◯ n Paar keer
- ◯ Baie

Q2. Het jou huidige of vorige seksmaat (byvoorbeeld jou man, eksman, mansvriend of vorige mansvriend) jou al ooit voor ander mense verkleineer of verneder?
Het dit baie gebeur, n paar keer of net een keer, of glad nie?

- ◯ Nooit
- ◯ Een keer
- ◯ n Paar keer
- ◯ Baie

Q3. Het jou huidige of vorige seksmaat (byvoorbeeld jou man, eksman, mansvriend of vorige mansvriend) al ooit opsetlik iets gedoen om jou bang te maak of te intimideer, byvoorbeeld deur jou op 'n sekere manier aan te kyk, te skel of goed te breek? Het dit baie gebeur, 'n paar keer of net een keer, of glad nie?

- ◯ Nooit
- ◯ Een keer
- ◯ n Paar keer
- ◯ Baie

Q4. Het jou huidige of vorige seksmaat (byvoorbeeld jou man, eksman, mansvriend of vorige mansvriend) al ooit gedreig om jou seer te maak?
Het dit baie gebeur, n paar keer of net een keer, of glad nie?

- ◯ Nooit
- ◯ Een keer
- ◯ n Paar keer
- ◯ Baie

Q5. Het jou huidige of vorige seksmaat (byvoorbeeld jou man, eksman, mansvriend of vorige mansvriend) in die afgelope 12 maande enige van hierdie dinge gedoen?

- ◯ Ja
- ◯ Nee

Q6. Het jou huidige of vorige seksmaat (byvoorbeeld jou man, eksman, mansvriend of vorige mansvriend) jou al ooit geklap of jou gegooi met iets wat jou kon seermaak?
Het dit baie gebeur, n paar keer of net een keer, of glad nie?

- ◯ Nooit
- ◯ Een keer
- ◯ n Paar keer
- ◯ Baie

Q7.Het jou huidige of vorige seksmaat (byvoorbeeld jou man, eksman, mansvriend of vorige mansvriend) jou al ooit gestamp of geruk?
Het dit baie gebeur, n paar keer of net een keer, of glad nie?

- ◯ Nooit
- ◯ Een keer
- ◯ n Paar keer
- ◯ Baie

Q8. Het jou huidige of vorige seksmaat (byvoorbeeld jou man, eksman, mansvriend of vorige mansvriend) jou al ooit geslaan met die vuis of met iets anders wat jou kon seermaak?
Het dit baie gebeur, n paar keer of net een keer, of glad nie?

- ◯ Nooit
- ◯ Een keer
- ◯ n Paar keer
- ◯ Baie

Q9. Het jou huidige of vorige seksmaat (byvoorbeeld jou man, eksman, mansvriend of vorige mansvriend) jou al ooit geskop, gesleep, geslaan, gewurg of met iets gebrand? Het dit baie gebeur, 'n paar keer of net een keer, of glad nie?

- ◯ Nooit
- ◯ Een keer
- ◯ 'n Paar keer
- ◯ Baie

Q10. Het jou huidige of vorige seksmaat (byvoorbeeld jou man, eksman, mansvriend of vorige mansvriend) al 'n mes, geweer of ander wapen teen jou gebruik of gedreig om dit te doen? Het dit baie gebeur, 'n paar keer of net een keer, of glad nie?

- ◯ Nooit
- ◯ Een keer
- ◯ 'n Paar keer
- ◯ Baie

Confidential

Q11. Het jou huidige of vorige seksmaat (byvoorbeeld jou man, eksman, mansvriend of vorige mansvriend) in die afgelope 12 maande enige van hierdie dinge gedoen?	◯ Ja ◯ Nee
Q12. Het jou huidige of vorige seksmaat (byvoorbeeld jou man, eksman, mansvriend of vorige mansvriend) jou al ooit fisiek gedwing om seks te hê?	◯ Nooit ◯ Een keer ◯ n Paar keer ◯ Baie
Q13. Het jy al ooit met jou huidige of vorige seksmaat (byvoorbeeld jou man, eksman, mansvriend of vorige mansvriend) seks gehad toe jy nie wou nie, omdat jy bang was vir hy dalk sou doen as jy weier? Het dit baie gebeur, n paar keer of net een keer, of glad nie?	◯ Nooit ◯ Een keer ◯ n Paar keer ◯ Baie
Q14. Het jou huidige of vorige seksmaat (byvoorbeeld jou man, eksman, mansvriend of vorige mansvriend) jou al ooit gedwing om iets seksueels te doen wat jou vernederd laat voel het? Het dit baie gebeur, n paar keer of net een keer, of glad nie?	◯ Nooit ◯ Een keer ◯ n Paar keer ◯ Baie
Q15. Het jou huidige of vorige seksmaat (byvoorbeeld jou man, eksman, mansvriend of vorige mansvriend) in die afgelope 12 maande enige van hierdie dinge gedoen?	◯ Ja ◯ Nee
Q16. Hierdie vraelys het jou oor n klomp moeilike dinge uitgevra. Hoe het dit vir jou gevoel om hierdie vrae te beantwoord?	◯ GOED/BETER ◯ SLEG/ERGER ◯ DIESELFDE/GEEN VERSKIL NIE
Q17. Het jy enige opmerkings, of is daar enigiets wat jy nog wil byvoeg?	_____

Ons besef dit is moeilik om sulke vrae te beantwoord, maar as ons nie by vroue self inligting kry nie, kan ons nie regtig begrip hê vir hulle gesondheidsake en ervarings van geweld in intieme verhoudings nie. Dankie dat jy ons gehelp het, en dat jy jou tyd afgestaan het om hierdie vraelys in te vul. 'n Lid van die studiegroep sal jou 'n lys gee van organisasies in jou omgewing wat ondersteuning, regshulp en beradingsdienste aan vroue bied. Jy kan die inligting saamneem huis toe, maar jy kan dit ook by die kliniek los as jy wil. Kom asseblief met hierdie organisasies in aanraking as jy met iemand oor jou situasie wil praat. Hulle dienste is verniet, en hulle sal alles wat jy vir hulle vertel vertroulik hou.

Kubo nabuphi na ubudlelwane kukho amaxesha amnandi namaxesha amabi. Oluxwebhu lwemibuzo likubuza ngamanye wamaxesha amabi usenokuba wawunawo kubudlewane kuba sifuna ukufunda ngakumbi malunga namava abafazi abathi babenawo ebomini babo. Akukho mpendulo ilungileyo nengalunganga. Kwaye nayiphi na into oyithethayo iza kugcinwa iyimfihlo. Umyeni/iqabane lakho alizukwaziswa ukuba besikubuze imibuzo malunga nobudlelwane benu. Akazukubuzwa lemibuzo ifanayo, kwaye akazukubona naziphi iimpendulo zakho kuleMibuzo. Nayiphi na incoko ongafuna ukuba nayo nomsebenzi wophando emveni kokuba ugqibe oluxwebhu lemibuzo _ ngoku okanye kwityelelo elizayo ekliniki _ luya kuba yimfihlo.

Confidential

Q1. Ingaba umyeni okanye iboyfriend yakho, yangoku okanye yakudala, (okanye lo owayengumyeni wakho ngaphambili) wakhe wakuthuka okanye wakwenza uzive ngathi ungumntu ombi?
Ingaba oku kwenzeke amatyeli amaninzi, amaxesha ambalwa, kanye okanye khange kwenzeke?

- ◯ Zange
- ◯ Kanye
- ◯ Kambalwa
- ◯ Kaninzi

Q2. Ingaba umyeni okanye iboyfriend yakho, yangoku okanye yakudala, (okanye lo owayengumyeni wakho ngaphambili) wakhe wakwenza uzive umncinci okanye wakuhlaza phambi kwabanye abantu?
Ingaba oku kwenzeke amatyeli amaninzi, amaxesha ambalwa, kanye, okanye akuzange kwenzeke?

- ◯ Zange
- ◯ Kanye
- ◯ Kambalwa
- ◯ Kaninzi

Q3.Ingaba umyeni okanye iboyfriend yakho, yangoku okanye yakudala, (okanye lo owayengumyeni wakho ngaphambili) wakhe wenza izinto ukuze ikoyikise okanye akusongele ngabom ngendlela akujonga ngayo, ngokukhwaza, aze ophule izinto?
Ingaba oku kwenzeke amatyeli amaninzi, amaxesha ambalwa, kanye okanye akuzange kwenzeke?

- ◯ Zange
- ◯ Kanye
- ◯ Kambalwa
- ◯ Kaninzi

Q4. Ingaba umyeni okanye iboyfriend yakho, yangoku okanye yakudala, (okanye lo owayengumyeni wakho ngaphambili) wakhe wakugrogrisa ngokukonzakalisa?
Ingaba oku kwenzeke amatyeli amaninzi, amaxesha ambalwa kanye, okanye akuzange kwenzeke?

- ◯ Zange
- ◯ Kanye
- ◯ Kambalwa
- ◯ Kaninzi

Q5. Ingaba umyeni okanye iboyfriend yakho, yangoku okanye yakudala, (okanye lo owayengumyeni wakho ngaphambili) wakhe wakwenza enye yezizinto kwizinyanga ziyi12 zidlulileyo?

- ◯ Ewe
- ◯ Hayi

Q6. Ingaba umyeni okanye iboyfriend yakho, yangoku okanye yakudala, (okanye lo owayengumyeni wakho ngaphambili) wakhe wakuqhwaba okanye akujule ngento enokulimaza?
Ingaba oku kwenzeke amatyeli amaninzi, amaxesha ambalwa, kanye, okanye akuzange kwenzeke?

- ◯ Zange
- ◯ Kanye
- ◯ Kambalwa
- ◯ Kaninzi

Q7. Ingaba umyeni okanye iboyfriend yakho, yangoku okanye yakudala, (okanye lo owayengumyeni wakho ngaphambili) wakhe wakutyhala ?
Ingaba oku kwenzeke amatyeli amaninzi, amaxesha ambalwa, kanye, okanye akuzange kwenzeke?

- ◯ Zange
- ◯ Kanye
- ◯ Kambalwa
- ◯ Kaninzi

Q8. Ingaba umyeni okanye iboyfriend yakho, yangoku okanye yakudala, (okanye lo owayengumyeni wakho ngaphambili) wakhe wakubetha ngenqindi okanye enye into enokukulimaza?
Ingaba oku kwenzeke amatyeli amaninzi, amaxesha ambalwa, kanye okanye akuzange kwenzeke?

- ◯ Zange
- ◯ Kanye
- ◯ Kambalwa
- ◯ Kaninzi

Confidential

Q9. Ingaba umyeni okanye iboyfriend yakho, yangoku okanye yakudala, (okanye lo owayengumyeni wakho ngaphambili) wakhe wakukhaba, wakurhuqa, wakubetha, wakukrwitsha okanye wakutshisa?
Ingaba oku kwenzeke amatyeli amaninzi, amaxesha ambalwa, kanye okanye akuzange kwenzeke?

- ◯ Zange
- ◯ Kanye
- ◯ Kambalwa
- ◯ Kaninzi

Q10. Ingaba umyeni okanye iboyfriend yakho, yangoku okanye yakudala, (okanye lo owayengumyeni wakho ngaphambili) wakhe wakoyikisa ngompu, imela, okanye ezinye izixhobo kuwe, okanye wazisebenzisa kuwe?
Ingaba oku kwenzeke amatyeli amaninzi, amaxesha ambalwa, kanye, okanye akuzange kwenzeke?

- ◯ Zange
- ◯ Kanye
- ◯ Kambalwa
- ◯ Kaninzi

Q11. Ingaba umyeni okanye iboyfriend yakho, yangoku okanye yakudala, (okanye lo owayengumyeni wakho ngaphambili) wakhe wakwenza enye yezizinto kwizinyanga ziyi12 zidlulileyo?

- ◯ Ewe
- ◯ Hayi

Q12. Ingaba umyeni okanye iboyfriend yakho, yangoku okanye yakudala, (okanye lo owayengumyeni wakho ngaphambili) wakhe wakunyanzelisa (ngezenzo) ukuba ulale naye nangona ungafuni.
Ingaba oku kwenzeke amatyeli amaninzi, amaxesha ambalwa, kanye, okanye akuzange kwenzeke?

- ◯ Zange
- ◯ Kanye
- ◯ Kambalwa
- ◯ Kaninzi

Q13. Ingaba wakhe walala nomyeni okanye iboyfriend yakho, yangoku okanye yakudala, (okanye lo owayengumyeni wakho ngaphambili) nangona ungafuni kuba usoyika oko angakwenza?
Ingaba oku kwenzeke amatyeli amaninzi, amaxesha ambalwa, kanye, okanye akuzange kwenzeke?

- ◯ Zange
- ◯ Kanye
- ◯ Kambalwa
- ◯ Kaninzi

Q14. Ingaba umyeni okanye iboyfriend yakho, yangoku okanye yakudala, (okanye lo owayengumyeni wakho ngaphambili) yakhe yakunyanzela ukuba wenze into engokwe sondo oyifumanisa ikwehlisa isidima okanye ikuhlaza?
Ingaba oku kwenzeke amatyeli amaninzi, amaxesha ambalwa, kanye, okanye akuzange kwenzeke?

- ◯ Zange
- ◯ Kanye
- ◯ Kambalwa
- ◯ Kaninzi

Q15. Ingaba umyeni okanye iboyfriend yakho, yangoku okanye yakudala, (okanye lo owayengumyeni wakho ngaphambili) wakhe wakwenza enye yezizinto kwizinyanga ziyi12 zidlulileyo?

- ◯ Ewe
- ◯ Hayi

Q16. Oluxwebhu lwemibuzo luye lwakubuza ngezinto ezininzi enzima. Kukwenze waziva njani ukuphendula lemibuzo?

- ◯ KAKUHLE/NGCONO
- ◯ KAKUBI/MANDUNDU
- ◯ KUSAFANA/AKHOMAHLUKO

Q17. Unalo na uluvo oluthile, okanye ikhona into engenye ongathanda ukuyongeza?

_____

Siyazi ukuba le yimibuzo enzima ukuyiphendula, kodwa kungokuva kubafazi apho sinokuqonda nyani malunga nempilo namava wobudlobongela beqabane elisondeleyo. Enkosi ngokusinceda nangokuthatha ixesha ugcwalisa oluxwebhu lwemibuzo. Umsebenzi wophando uzakunika uluhlu lwemibutho enikezela ngenkxaso, ingcebiso ngezomthetho, neenkonzo zengcebiso kubafazi (ikhanseling) engingqini yakho. Ungazithatha ezinkcukacha uye nazo ekhaya okanye uzishiye ekliniki ukuba ukhetha oko. Nceda unxulumane nezizinkonzo ukuba ngaba uyafuna ukuthetha nomnye umntu malunga nemeko yakho. Ezinkonzo azihlawulelwa, kwaye baya kugcina yonke into oyithethayo iyimfihlo. Ungaya nanini na uziva ukulungele.

APPENDIX D
The Peri-traumatic distress inventory in English, Afrikaans, and isiXhosa

Confidential

Ps Pdi

Child PID _____

What language will this questionaire be administered in?
- ○ English
- ○ Afrikaans
- ○ Xhosa

Instructions: Please complete this questionnaire after you have completed:1. Life Events Questionnaire2. Modified PTSD Symptom Scale (MPSS)To complete this questionnaire, please use the same event that you used to answer the Modified PTSD Symptom Scale (MPSS).If there has been no such event in your lifetime, and you did not answer the Modified PTSD Symptom Scale (MPSS), you are not required to complete this questionnaire.

Now, please rate the extent to which you have experienced each item during, and immediately after, the event you selected.

	Not at all true	Once in a while/a little bit/slightly true	Sometimes/some what true	Often/very true	Extremely true
Q1. I felt helpless to do more.	○	○	○	○	○
Q2. I felt sadness and grief.	○	○	○	○	○
Q3. I felt frustrated or angry I could not do more.	○	○	○	○	○
Q4. I felt afraid for my safety.	○	○	○	○	○
Q5. I felt guilty that more was not done.	○	○	○	○	○
Q6. I felt ashamed of my emotional reactions.	○	○	○	○	○
Q7. I felt afraid about the safety of others.	○	○	○	○	○
Q8. I had the feeling I was about to lose control of my emotions.	○	○	○	○	○
Q9. I had difficulty controlling my bowel and bladder.	○	○	○	○	○
Q10. I was horrified by what happened.	○	○	○	○	○
Q11. I had physical reactions like sweating, shaking, and pounding heart.	○	○	○	○	○
Q12. I felt I might pass out.	○	○	○	○	○
Q13. I thought I might die.	○	○	○	○	○

INSTRUKSIES:Vul asseblief hierdie vraelys in nadat jy die volgende ingevul het:1. Lewensgebeure-vraelys2. Aangepaste Skaal vir PTSS-Simptome (MPSS).Gebruik asseblief dieselfde gebeurtenis soos in die Aangepaste Skaal vir PTSS-Simptome (MPSS) om hierdie vraelys in te vul.As jy nog nooit so iets beleef het nie, en as jy nie die Aangepaste Skaal vir PTSS-Simptome (MPSS) ingevul het nie, hoef jy nie hierdie vraelys in te vul nie.

	Glad nie	Af en toe/'n bietjie/effens	Soms/redelik	Dikwels/beslis	Uitermate

Confidential

Q1. Ek het gevoel ek is magteloos om iets meer te doen.	○	○	○	○	○
Q2. Ek was hartseer en het gevoel soos een wat rou.	○	○	○	○	○
Q3. Ek het gefrustreerd en kwaad gevoel omdat ek nie meer kon doen nie.	○	○	○	○	○
Q4. Ek was bevrees oor my veiligheid.	○	○	○	○	○
Q5. Ek het skuldig gevoel dat daar nie meer aan die saak gedoen is nie.	○	○	○	○	○
Q6. Ek het my oor my emosionele reaksies geskaam.	○	○	○	○	○
Q7. Ek het my oor ander mense se veiligheid bekommer.	○	○	○	○	○
Q8. Ek het gevoel asof ek op pad was om beheer oor my emosies te verloor.	○	○	○	○	○
Q9. Ek het gesukkel om my nie nat te maak of te bevuil nie.	○	○	○	○	○
Q10. Ek was tot in my siel geskok oor wat gebeur het.	○	○	○	○	○
Q11.Ek het liggaamlike reaksies soos sweet, bewerigheid en hartkloppings gekry.	○	○	○	○	○
Q12. Ek het gevoel asof ek gaan flou raak.	○	○	○	○	○
Q13. Ek het gevoel dat ek gaan sterf.	○	○	○	○	○

IMIYALELO:Nceda ugcwalise elixwebhu lwemibuzo emveni ugqibile:1. Uxwebhu Lemibuzo Yeziganeko Zobomi (Life Events Questionnaire)2. Isikali Seempawu ze-PTSD Esitshintshiweyo (Modified PTSD Symptom Scale - MPSS)Ukugcwalisa elixwebhu lemibuzo, nceda usebenzise isiganeko esifanayo nesiya ubusisebenzisile ukuphendula Isikali Seempawu ze-PTSD Esitshintshileyo (Modified PTSD Symptom Scale - MPSS).Ukuba khange kubekho siganeko esinjalo ebomini bakho, kwaye khange usiphendule Isikali Seempawu ze-PTSD Esitshintshileyo (Modified PTSD Symptom Scale - MPSS), akukho mfuneko yokuba ugcwalise elixwebhu lemibuzo

Confidential

	Asiyo nyani	Manqaphanqapha / Kancinane / Asiyo nyani kangako	Maxawambi/ Yinyani noko	Qho / Yinyani kakhulu	Yinyani ngokugqithisileyo
Q1. Ndizive ndingekukwazi ukwenza okunye.	○	○	○	○	○
Q2.Bendinosizi nentlungu.	○	○	○	○	○
Q3. Ndizive ndinomsindo kuba ndingenakwenza ngakumbi.	○	○	○	○	○
Q4. Ndizive ndisoyikela ukhuseleko lwam.	○	○	○	○	○
Q5. Ndizive ndinetyla ukuba kungenziwanga okungakumbi.	○	○	○	○	○
Q6. Ndizive ndinentloni ngendlela endiye ndaphatheka ngayo emoyeni/emphefumlweni.	○	○	○	○	○
Q7. Ndizive ndikhathezekile ngokhuseleko lwabanye.	○	○	○	○	○
Q8. Ndizive ngathi andizukwazi ukuzibamba indlela endivakalelwa ngayo emoyeni/emphefumlweni.	○	○	○	○	○
Q9. Bendinobunzima ukubamba isisu nesinya sam.	○	○	○	○	○
Q10. Ndothuka kakhulu koko kwenzekileyo.	○	○	○	○	○
Q11. Ndigule ngokwasenyameni, njengokubila, ukungcangcazela nentliziyo ebetha ngamandla.	○	○	○	○	○
Q12. Ndizive ingathi ndingafa isiqaqa.	○	○	○	○	○
Q13. Ndicinge ukuba ndingafa.	○	○	○	○	○

APPENDIX E
The Mini-International Neuropsychiatric Interview Summary Sheet

Confidential

Mini Summary Sheet

Child PID _____

Baseline or follow-up assessment
- ○ Baseline
- ○ Follow-up

Interviewer
- ○ Karen Mare ○ Bulumko Lusu
- ○ Eileen Thomas ○ Lee Ginton
- ○ Other ○ Claire van der Westhuizen

If other, please specify _____

Interview date _____

First language
- ○ Afrikaans
- ○ English
- ○ Xhosa
- ○ Other

Language administered
- ○ Afrikaans
- ○ English
- ○ Xhosa
- ○ Other

Translator used
- ○ Yes
- ○ No

Name of translator _____

Site of administration
- ○ TC Newman
- ○ Mbekweni
- ○ Eye tracking

Major Depressive Episode

Major Depressive Episode
- ☐ Current
- ☐ Past
- ☐ Recurrent
- ☐ No

Number of episodes _____

Major Depressive Disorder

Major Depressive Disorder
- ○ Yes
- ○ No

Confidential

Suicidality

Suicidality	○ Yes ○ No
Suicidality Intensity	○ Low ○ Moderate ○ High
Suicidality Score	_____

Manic and Hypomanic Episodes

Manic Episode	○ Current ○ Past ○ No
Hypomanic Episode	○ Current ○ Past ○ Not explored ○ No
Hypomanic Symptoms	○ Current ○ Past ○ Not explored ○ No
Bipolar 1	○ Yes ○ No
Most Recent Episode	○ Manic ○ Depressed ○ Hypomanic ○ Unspecified ○ Mixed
Bipolar 2	○ Yes ○ No
Most Recent Episode	○ Hypomanic ○ Depressed ○ Unspecified ○ Mixed
Bipolar Disorder NOS	○ Yes ○ No

Panic Disorder

Panic Disorder (No Agoraphobia)	○ Current (Past month) ○ Lifetime ○ No
Panic Disorder with Agoraphobia	○ Yes ○ No

Confidential

Agoraphobia

Agoraphobia	○ Current ○ No

Social Phobia

Social Phobia	○ Current Generalized ○ Current Non-generalized ○ No

OCD

Obsessive Compulsive Disorder	○ Current (Past month) ○ No

PTSD

Post-traumatic Stress Disorder	☐ Current (Past month) ☐ Lifetime ☐ Trauma Exposed (w/o PTSD) ☐ No
Episode(s) Related to Current PTSD	☐ Episode 1 ☐ Episode 2 ☐ Episode 3
Episode(s) Related to Lifetime PTSD	☐ Episode 1 ☐ Episode 2 ☐ Episode 3
Episode(s) Related to Trauma Exposure	☐ Episode 1 ☐ Episode 2 ☐ Episode 3
Number of episodes	○ 1 ○ 2 ○ 3 ○ more than 3

Life events Episode 1

Confidential

LEC category E1

- ○ Natural disaster
- ○ Fire/explosion
- ○ Transport accident
- ○ Serious accident
- ○ Toxic substance
- ○ Physical assault
- ○ Weapon assault
- ○ Sexual assault / attempted
- ○ Sexual other
- ○ Combat
- ○ Captivity
- ○ Illness / Injury
- ○ Severe suffering
- ○ Sudden violent death
- ○ Sudden death of loved one
- ○ Serious harm caused to someone else
- ○ Other
- ○ Pregnancy / peripartum trauma

Experienced/Witnessed E1

- ○ Experienced
- ○ Witnessed

Date of E1 _____

Life Events Episode 2

LEC Category E2

- ○ Natural disaster
- ○ Fire/explosion
- ○ Transport accident
- ○ Serious accident
- ○ Toxic substance
- ○ Physical assault
- ○ Weapon assault
- ○ Sexual assault / attempted
- ○ Sexual other
- ○ Combat
- ○ Captivity
- ○ Illness / Injury
- ○ Severe suffering
- ○ Sudden violent death
- ○ Sudden death of loved one
- ○ Serious harm caused to someone else
- ○ Other
- ○ Pregnancy / peripartum trauma

Experienced/Witnessed E2

- ○ Experienced
- ○ Witnessed

Date of E2 _____

Confidential

Life Events Episode 3

LEC category E3

- ◯ Natural disaster
- ◯ Fire/explosion
- ◯ Transport accident
- ◯ Serious accident
- ◯ Toxic substance
- ◯ Physical assault
- ◯ Weapon assault
- ◯ Sexual assault / attempted
- ◯ Sexual other
- ◯ Combat
- ◯ Captivity
- ◯ Illness / Injury
- ◯ Severe suffering
- ◯ Sudden violent death
- ◯ Sudden death of loved one
- ◯ Serious harm caused to someone else
- ◯ Other
- ◯ Pregnancy / peripartum trauma

Experienced/Witnessed E3

- ◯ Experienced
- ◯ Witnessed

Date of E3 _____

Alcohol Abuse

Alcohol Dependence

- ◯ In the last 12 months
- ◯ No

Alcohol Abuse

- ◯ In the last 12 months
- ◯ No

Substance Abuse

Substance Dependence

- ◯ Past 12 Months
- ◯ No

Substances _____

Substance Abuse

- ◯ Past 12 months
- ◯ No

Substances _____

Confidential

Psychotic Disorders

Psychotic Disorders	○ Lifetime ○ Current ○ No
Mood Disorder with Psychotic Features	○ Lifetime ○ Current ○ No

Eating Disorders

Anorexia Nervosa	○ Current (Past 3 months) ○ No
Bulimia Nervosa	○ Current (Past 3 months) ○ No
Anorexia Nervosa, Binge eating/Purging Type	○ Current ○ No

GAD

Generalised Anxiety Disorder	○ Current (Past 6 months) ○ No

Anti-social Personality Disorder

Anti-social Personality Disorder	○ Lifetime ○ No

Primary Diagnosis

Primary Diagnosis	_____

APPENDIX F
The Alcohol, Smoking and Substance Involvement Screening Test in English, Afrikaans, and isiXhosa

Confidential

Ps Assist

Child PID _____

CRF completion date _____

What language will this questionaire be administered in?
- ○ English
- ○ Afrikaans
- ○ Xhosa

These are some questions about your experience of using substances across your lifetime and in the past three months. These substances can be smoked, swallowed, snorted, inhaled, injected or taken in the form of pills. Some of the substances listed may be prescribed by a doctor (like amphetamines, sedatives, pain medications). For these questions, do not record medications that are used as prescribed by your doctor. However, if you have taken such medications for reasons other than prescription, or taken them more frequently or at higher doses than prescribed, please record these. While we are also interested in knowing about your use of various illicit (illegal) drugs, please be assured that information on such use will be treated as confidential.

In your life, which of the following substances have you ever used? (NON-MEDICAL USE ONLY)

Q1.a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)
- ○ No
- ○ Yes

Q1.b. Alcoholic beverages (beer, wine, spirits, etc.)
- ○ No
- ○ Yes

Q1.c. Cannabis (marijuana, pot, grass, hash, dagga, etc.)
- ○ No
- ○ Yes

Q1.d. Cocaine (coke, crack, etc.)
- ○ No
- ○ Yes

Q1.e. Amphetamine-type stimulants (speed, diet pills, ecstasy, Tik, etc.)
- ○ No
- ○ Yes

Q1.f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)
- ○ No
- ○ Yes

Q1.g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)
- ○ No
- ○ Yes

Q1.h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)
- ○ No
- ○ Yes

Q1.i. Opioids (heroin, morphine, methadone, codeine, etc.)
- ○ No
- ○ Yes

Q1.j.1. Other
- ○ No
- ○ Yes

Q1.j.2. Specify other _____

(If no to all, end of questionnaire)

Confidential

In the past three months, how often have you used the substances you mentioned (FIRST DRUG, SECOND DRUG, ETC)?

Q2.a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily (If _Never)
Q2.b. Alcoholic beverages (beer, wine, spirits, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q2.c. Cannabis (marijuana, pot, grass, hash, dagga, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q2.d. Cocaine (coke, crack, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q2.e. Amphetamine-type stimulants (speed, diet pills, ecstasy, Tik, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q2.f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q2.g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q2.h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q2.i. Opioids (heroin, morphine, methadone, codeine, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily

Confidential

Q2.j.1. Other (as specified above)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily

During the past three months, how often have you had a strong desire or urge to use (FIRST DRUG, SECOND DRUG, ETC)?

Q3.a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q3.b. Alcoholic beverages (beer, wine, spirits, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q3.c. Cannabis (marijuana, pot, grass, hash, dagga, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q3.d. Cocaine (coke, crack, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q3.e. Amphetamine-type stimulants (speed, diet pills, ecstasy, Tik, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q3.f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q3.g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q3.h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily

Confidential

Q3.i. Opioids (heroin, morphine, methadone, codeine, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q3.j.1. Other (as specified above)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily

During the past three months, how often has your use of (FIRST DRUG, SECOND DRUG, ETC) led to health, social, legal or financial problems?

Q4.a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q4.b. Alcoholic beverages (beer, wine, spirits, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q4.c. Cannabis (marijuana, pot, grass, hash, dagga, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q4.d. Cocaine (coke, crack, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q4.e. Amphetamine-type stimulants (speed, diet pills, ecstasy, Tik, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q4.f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q4.g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily

Confidential

Q4.h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q4.i. Opioids (heroin, morphine, methadone, codeine, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q4.j.1. Other (as specified above)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily

During the past three months, how often have you failed to do what was normally expected of you because of your use of (FIRST DRUG, SECOND DRUG, ETC)?

Q5.a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q5.b. Alcoholic beverages (beer, wine, spirits, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q5.c. Cannabis (marijuana, pot, grass, hash, dagga, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q5.d. Cocaine (coke, crack, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q5.e. Amphetamine-type stimulants (speed, diet pills, ecstasy, Tik, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q5.f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily

Confidential

Q5.g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q5.h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q5.i. Opioids (heroin, morphine, methadone, codeine, etc.)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily
Q5.j.1. Other (as specified above)	◯ Never ◯ Once or twice ◯ Monthly ◯ Weekly ◯ Daily or almost daily

Has a friend or relative or anyone else ever expressed concern about your use of (FIRST DRUG, SECOND DRUG, ETC)?

Q6.a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	◯ No, never ◯ Yes, in the past 3 months ◯ Yes, but not in the past 3 months
Q6.b. Alcoholic beverages (beer, wine, spirits, etc.)	◯ No, never ◯ Yes, in the past 3 months ◯ Yes, but not in the past 3 months
Q6.c. Cannabis (marijuana, pot, grass, hash, dagga, etc.)	◯ No, never ◯ Yes, in the past 3 months ◯ Yes, but not in the past 3 months
Q6.d. Cocaine (coke, crack, etc.)	◯ No, never ◯ Yes, in the past 3 months ◯ Yes, but not in the past 3 months
Q6.e. Amphetamine-type stimulants (speed, diet pills, ecstasy, Tik, etc.)	◯ No, never ◯ Yes, in the past 3 months ◯ Yes, but not in the past 3 months
Q6.f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	◯ No, never ◯ Yes, in the past 3 months ◯ Yes, but not in the past 3 months
Q6.g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	◯ No, never ◯ Yes, in the past 3 months ◯ Yes, but not in the past 3 months
Q6.h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	◯ No, never ◯ Yes, in the past 3 months ◯ Yes, but not in the past 3 months

Confidential

Q6.i. Opioids (heroin, morphine, methadone, codeine, etc.)	○ No, never ○ Yes, in the past 3 months ○ Yes, but not in the past 3 months
Q6.j.1. Other (as specified above)	○ No, never ○ Yes, in the past 3 months ○ Yes, but not in the past 3 months

Have you ever tried and failed to control, cut down or stop using (FIRST DRUG, SECOND DRUG, ETC)?

Q7.a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	○ No, never ○ Yes, in the past 3 months ○ Yes, but not in the past 3 months
Q7.b. Alcoholic beverages (beer, wine, spirits, etc.)	○ No, never ○ Yes, in the past 3 months ○ Yes, but not in the past 3 months
Q7.c. Cannabis (marijuana, pot, grass, hash, dagga, etc.)	○ No, never ○ Yes, in the past 3 months ○ Yes, but not in the past 3 months
Q7.d. Cocaine (coke, crack, etc.)	○ No, never ○ Yes, in the past 3 months ○ Yes, but not in the past 3 months
Q7.e. Amphetamine-type stimulants (speed, diet pills, ecstasy, Tik, etc.)	○ No, never ○ Yes, in the past 3 months ○ Yes, but not in the past 3 months
Q7.f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	○ No, never ○ Yes, in the past 3 months ○ Yes, but not in the past 3 months
Q7.g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	○ No, never ○ Yes, in the past 3 months ○ Yes, but not in the past 3 months
Q7.h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	○ No, never ○ Yes, in the past 3 months ○ Yes, but not in the past 3 months
Q7.i. Opioids (heroin, morphine, methadone, codeine, etc.)	○ No, never ○ Yes, in the past 3 months ○ Yes, but not in the past 3 months
Q7.j.1. Other (as specified above)	○ No, never ○ Yes, in the past 3 months ○ Yes, but not in the past 3 months

Injection drugs

Q8. Have you ever used any drug by injection? (NON-MEDICAL USE ONLY)
- ○ No, never
- ○ Yes, in the past 3 months
- ○ Yes, but not in the past 3 months

Wat hier volg, is n aantal vrae oor watter medikasie en ander middels jy al in jou lewe gebruik het, en wat jy die afgelope drie maande gebruik het. Dit kan middels wees wat n mens rook, drink, snuif, inasem, inspuit of in die vorm van n pil sluk. Sommige van die middels op die lys kan deur n dokter voorgeskryf word (soos amfetamiene, verdowingsmiddels en pynmedikasie). Wanneer jy hierdie vraelys invul, moet asseblief nie medikasie opteken wat jy gebruik omdat jou dokter dit so voorgeskryf het nie. Maar as jy sulke medikasie geneem het sonder dat dit vir jou so voorgeskryf is, of as jy dit meer dikwels of in groter hoeveelhede geneem het as wat voorgeskryf is, dui dit asseblief wel aan. Ons wil ook graag weet of jy sekere soorte verbode (onwettige) middels gebruik het. Wees asseblief verseker dat ons sulke inligting vertroulik sal hou.

Watter van die volgende middels het jy al ooit in jou lewe gebruik? (SLEGS NIE-MEDISINALE GEBRUIK)

Q1.a. Tabakprodukte (sigarette, pruimtabak, sigare, ens.)
- ○ Nee
- ○ Ja

Q1.b. Alkoholiese drank (bier, wyn, sterk drank, ens.)
- ○ Nee
- ○ Ja

Q1.c. Cannabis (marijuana, pot, grass, hasjisj, dagga, ens.)
- ○ Nee
- ○ Ja

Q1.d. Kokaien (coke, crack, ens.)
- ○ Nee
- ○ Ja

Q1.e. Amfetamientipe stimulante (speed, eetlusdempers, ecstasy, tik, ens.)
- ○ Nee
- ○ Ja

Q1.f. Inasemingsmiddels (laggas, gom, petrol, verfverdunner, ens.)
- ○ Nee
- ○ Ja

Q1.g. Verdowingsmiddels of slaappille (Valium, Serepax, Rohypnol, ens.)
- ○ Nee
- ○ Ja

Q1.h. Hallusinogene (LSD, acid, mushrooms, PCP, Special K, ens.)
- ○ Nee
- ○ Ja

Q1.i. Opioiede (heroien, morfien, metadoon, kodeien, ens.)
- ○ Nee
- ○ Ja

Q1.j.1. Ander
- ○ Nee
- ○ Ja

Q1.j.2. Noem hulle: _____

Hoe dikwels het jy gedurende die afgelope drie maande die middels gebruik wat jy nou net genoem het (EERSTE MIDDEL, TWEEDE MIDDEL, ENS.)?

Q2.a. Tabakprodukte (sigarette, pruimtabak, sigare, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q2.b. Alkoholiese drank (bier, wyn, sterk drank, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q2.c. Cannabis (marijuana, pot, grass, hasjisj, dagga, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q2.d. Kokaien (coke, crack, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q2.e. Amfetamientipe stimulante (speed, eetlusdempers, ecstasy, tik, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q2.f. Inasemingsmiddels (laggas, gom, petrol, verfverdunner, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q2.g. Verdowingsmiddels of slaappille (Valium, Serepax, Rohypnol, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q2.h. Hallusinogene (LSD, acid, mushrooms, PCP, Special K, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q2.i. Opioiede (heroien, morfien, metadoon, kodeien, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q2.j.1. Ander	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag

Hoe dikwels het jy gedurende die afgelope drie maande n sterk begeerte of drang gehad om (EERSTE MIDDEL, TWEEDE MIDDEL, ENS.) te gebruik?

Q3.a. Tabakprodukte (sigarette, pruimtabak, sigare, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q3.b. Alkoholiese drank (bier, wyn, sterk drank, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q3.c. Cannabis (marijuana, pot, grass, hasjisj, dagga, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q3.d. Kokaien (coke, crack, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q3.e. Amfetamientipe stimulante (speed, eetlusdempers, ecstasy, tik, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q3.f. Inasemingsmiddels (laggas, gom, petrol, verfverdunner, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q3.g. Verdowingsmiddels of slaappille (Valium, Serepax, Rohypnol, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q3.h. Hallusinogene (LSD, acid, mushrooms, PCP, Special K, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q3.i. Opioiede (heroien, morfien, metadoon, kodeien, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q3.j.1. Ander	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag

Hoe dikwels het jou gebruik van (EERSTE MIDDEL, TWEEDE MIDDEL, ENS.) gedurende die afgelope drie maande tot sosiale probleme of probleme met jou gesondheid, die gereg of jou geldsake gelei?

Q4.a. Tabakprodukte (sigarette, pruimtabak, sigare, ens.)
- ◯ Nooit
- ◯ Een of twee keer
- ◯ Een keer 'n maand
- ◯ Een keer 'n week
- ◯ Elke dag of byna elke dag

Q4.b. Alkoholiese drank (bier, wyn, sterk drank, ens.)
- ◯ Nooit
- ◯ Een of twee keer
- ◯ Een keer 'n maand
- ◯ Een keer 'n week
- ◯ Elke dag of byna elke dag

Q4.c. Cannabis (marijuana, pot, grass, hasjisj, dagga, ens.)
- ◯ Nooit
- ◯ Een of twee keer
- ◯ Een keer 'n maand
- ◯ Een keer 'n week
- ◯ Elke dag of byna elke dag

Q4.d. Kokaien (coke, crack, ens.)
- ◯ Nooit
- ◯ Een of twee keer
- ◯ Een keer 'n maand
- ◯ Een keer 'n week
- ◯ Elke dag of byna elke dag

Q4.e. Amfetamientipe stimulante (speed, eetlusdempers, ecstasy, tik, ens.)
- ◯ Nooit
- ◯ Een of twee keer
- ◯ Een keer 'n maand
- ◯ Een keer 'n week
- ◯ Elke dag of byna elke dag

Q4.f. Inasemingsmiddels (laggas, gom, petrol, verfverdunner, ens.)
- ◯ Nooit
- ◯ Een of twee keer
- ◯ Een keer 'n maand
- ◯ Een keer 'n week
- ◯ Elke dag of byna elke dag

Q4.g. Verdowingsmiddels of slaappille (Valium, Serepax, Rohypnol, ens.)
- ◯ Nooit
- ◯ Een of twee keer
- ◯ Een keer 'n maand
- ◯ Een keer 'n week
- ◯ Elke dag of byna elke dag

Q4.h. Hallusinogene (LSD, acid, mushrooms, PCP, Special K, ens.)
- ◯ Nooit
- ◯ Een of twee keer
- ◯ Een keer 'n maand
- ◯ Een keer 'n week
- ◯ Elke dag of byna elke dag

Q4.i. Opioiede (heroien, morfien, metadoon, kodeien, ens.)
- ◯ Nooit
- ◯ Een of twee keer
- ◯ Een keer 'n maand
- ◯ Een keer 'n week
- ◯ Elke dag of byna elke dag

Q4.j.1. Ander	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag

Hoe dikwels kon jy gedurende die afgelope drie maande nie doen wat normaalweg van jou verwag word nie weens die feit dat jy (EERSTE MIDDEL, TWEEDE MIDDEL, ENS.) gebruik het?

Q5.a. Tabakprodukte (sigarette, pruimtabak, sigare, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q5.b. Alkoholiese drank (bier, wyn, sterk drank, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q5.c. Cannabis (marijuana, pot, grass, hasjisj, dagga, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q5.d. Kokaien (coke, crack, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q5.e. Amfetamientipe stimulante (speed, eetlusdempers, ecstasy, tik, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q5.f. Inasemingsmiddels (laggas, gom, petrol, verfverdunner, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q5.g. Verdowingsmiddels of slaappille (Valium, Serepax, Rohypnol, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag
Q5.h. Hallusinogene (LSD, acid, mushrooms, PCP, Special K, ens.)	◯ Nooit ◯ Een of twee keer ◯ Een keer 'n maand ◯ Een keer 'n week ◯ Elke dag of byna elke dag

Q5.i. Opioiede (heroien, morfien, metadoon, kodeien, ens.)	○ Nooit ○ Een of twee keer ○ Een keer 'n maand ○ Een keer 'n week ○ Elke dag of byna elke dag
Q5.j.1. Ander	○ Nooit ○ Een of twee keer ○ Een keer 'n maand ○ Een keer 'n week ○ Elke dag of byna elke dag

Het n vriend of familielid of enigiemand anders al ooit ges hulle is daaroor bekommerd dat jy (EERSTE MIDDEL, TWEEDE MIDDEL, ENS.) gebruik?

Q6.a. Tabakprodukte (sigarette, pruimtabak, sigare, ens.)	○ Nee, nog nooit nie ○ Ja, gedurende die afgelope 3 maande ○ Ja, Maar nie gedurende die
Q6.b. Alkoholiese drank (bier, wyn, sterk drank, ens.)	○ Nee, nog nooit nie ○ Ja, gedurende die afgelope 3 maande ○ Ja, Maar nie gedurende die
Q6.c. Cannabis (marijuana, pot, grass, hasjisj, dagga, ens.)	○ Nee, nog nooit nie ○ Ja, gedurende die afgelope 3 maande ○ Ja, Maar nie gedurende die
Q6.d. Kokaien (coke, crack, ens.)	○ Nee, nog nooit nie ○ Ja, gedurende die afgelope 3 maande ○ Ja, Maar nie gedurende die
Q6.e. Amfetamientipe stimulante (speed, eetlusdempers, ecstasy, tik, ens.)	○ Nee, nog nooit nie ○ Ja, gedurende die afgelope 3 maande ○ Ja, Maar nie gedurende die
Q6.f. Inasemingsmiddels (laggas, gom, petrol, verfverdunner, ens.)	○ Nee, nog nooit nie ○ Ja, gedurende die afgelope 3 maande ○ Ja, Maar nie gedurende die
Q6.g. Verdowingsmiddels of slaappille (Valium, Serepax, Rohypnol, ens.)	○ Nee, nog nooit nie ○ Ja, gedurende die afgelope 3 maande ○ Ja, Maar nie gedurende die
Q6.h. Hallusinogene (LSD, acid, mushrooms, PCP, Special K, ens.)	○ Nee, nog nooit nie ○ Ja, gedurende die afgelope 3 maande ○ Ja, Maar nie gedurende die
Q6.i. Opioiede (heroien, morfien, metadoon, kodeien, ens.)	○ Nee, nog nooit nie ○ Ja, gedurende die afgelope 3 maande ○ Ja, Maar nie gedurende die
Q6.j.1. Ander	○ Nee, nog nooit nie ○ Ja, gedurende die afgelope 3 maande ○ Ja, Maar nie gedurende die

Het jy al ooit probeer om jou gebruik van (EERSTE MIDDEL, TWEEDE MIDDEL, ENS.) te beheer of te verminder, of om daarmee op te hou, maar sonder sukses?

Q7.a. Tabakprodukte (sigarette, pruimtabak, sigare, ens.)	◯ Nee, nog nooit nie ◯ Ja, gedurende die afgelope 3 maande ◯ Ja, maar nie in die afgelope 3 maande nie
Q7.b. Alkoholiese drank (bier, wyn, sterk drank, ens.)	◯ Nee, nog nooit nie ◯ Ja, gedurende die afgelope 3 maande ◯ Ja, maar nie in die afgelope 3 maande nie
Q7.c. Cannabis (marijuana, pot, grass, hasjisj, dagga, ens.)	◯ Nee, nog nooit nie ◯ Ja, gedurende die afgelope 3 maande ◯ Ja, maar nie in die afgelope 3 maande nie
Q7.d. Kokaien (coke, crack, ens.)	◯ Nee, nog nooit nie ◯ Ja, gedurende die afgelope 3 maande ◯ Ja, maar nie in die afgelope 3 maande nie
Q7.e. Amfetamientipe stimulante (speed, eetlusdempers, ecstasy, tik, ens.)	◯ Nee, nog nooit nie ◯ Ja, gedurende die afgelope 3 maande ◯ Ja, maar nie in die afgelope 3 maande nie
Q7.f. Inasemingsmiddels (laggas, gom, petrol, verfverdunner, ens.)	◯ Nee, nog nooit nie ◯ Ja, gedurende die afgelope 3 maande ◯ Ja, maar nie in die afgelope 3 maande nie
Q7.g. Verdowingsmiddels of slaappille (Valium, Serepax, Rohypnol, ens.)	◯ Nee, nog nooit nie ◯ Ja, gedurende die afgelope 3 maande ◯ Ja, maar nie in die afgelope 3 maande nie
Q7.h. Hallusinogene (LSD, acid, mushrooms, PCP, Special K, ens.)	◯ Nee, nog nooit nie ◯ Ja, gedurende die afgelope 3 maande ◯ Ja, maar nie in die afgelope 3 maande nie
Q7.i. Opioiede (heroien, morfien, metadoon, kodeien, ens.)	◯ Nee, nog nooit nie ◯ Ja, gedurende die afgelope 3 maande ◯ Ja, maar nie in die afgelope 3 maande nie
Q7.j.1. Ander	◯ Nee, nog nooit nie ◯ Ja, gedurende die afgelope 3 maande ◯ Ja, maar nie in die afgelope 3 maande nie

Injection drugs

Q8. Het jy al ooit enige dwelmmiddel gebruik waarmee n mens jou inspuit? (SLEGS NIE-MEDISINALE GEBRUIK)	◯ Nee, nog nooit nie ◯ Ja, gedurende die afgelope 3 maande ◯ Ja, maar nie gedurende die afgelope 3 maande nie

Le yeminye yemibuzo malunga namava akho okusebenzisa iziyobisi ebomini bakho bonke nakwinyanga ezintathu ezidlulileyo. Eziziyobisi zinga tshwaywa, ziginywe, zirhogelwe, zitsalwe ngomoya, zitofelwe, okanye zityiwe ngamanzi. Ezinye zeziziyobisi ezikoluluhlu zingagunyazwa ngugqirha (njengee-amphetamines, i-sedatives, amayeza eentlungu). Kulemibuzo, sukuwabhala amayeza owasebenzisa njengoko kugunyazwe ngugqirha wakho. Noko, ukuba uthe wawathatha lamayeza ngeenjongo ezingezinye kunezo zigunyazisiweyo, okanye wazithatha ngakumbi okanye kaninzi kunoko ubugunyazisiwe, nceda uzibhale. Ngoxa, sinomdla wokwazi ngokusebenzisa kwakho iziyobisi ezingekhomthethweni, ncede uqiniseke ukuba olulwazi malunga nentsebenziso enjalo luya kuphathwa njengemfihlo.

Ebomini bakho sesiphi isiyobisi okhe wasisebenzisa kwezi zilandelayo? (EZINGESIZO ZONYANGO)

Q1.a. Imveliso zecuba (isigareti, icuba elihlafunwayo, i-cigars, njalonjalo.)	○ Hayi ○ Ewe
Q1.b. Iziselo zotywala (ibhiya, iwayini, i-spirits, njalonjalo.)	○ Hayi ○ Ewe
Q1.c Intsango (marijuana, pot, grass, hash, dagga, etc.)	○ Hayi ○ Ewe
Q1.d. Cocaine (coke, crack, etc.)	○ Hayi ○ Ewe
Q1.e. Amphetamine-type stimulants (speed, diet pills, ecstasy, Tik, etc.)	○ Hayi ○ Ewe
Q1.f. Ezitsalwa ngomoya (nitrous, glue, petrol, paint thinner, etc.)	○ Hayi ○ Ewe
Q1.g.Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	○ Hayi ○ Ewe
Q1.h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	○ Hayi ○ Ewe
Q1.i. Opioids (heroin, morphine, methadone, codeine, etc.)	○ Hayi ○ Ewe
Q1.j Enye cacisa:	○ Hayi ○ Ewe
Q1.j.2. Specify other	_____

Kwezinyanga zintathu zidlulileyo, uzisebenzise kangaphi eziziyobisi uzichazileyo?(ISIYOBISI SOKUQALA,ISIYOBISI SESIBINI, NJALONJALO)?

Q2.a. Imveliso zecuba (isigareti, icuba elihlafunwayo, i-cigars, njalonjalo.)	○ Zange ○ Kanye okanye Kabini ○ Qho ngenyanga ○ Qho ngeveki ○ Ntsuku zonke okanye Phantse ntsuku zonke
Q2.b Iziselo zotywala (ibhiya, iwayini, i-spirits, njalonjalo.)	○ Zange ○ Kanye okanye Kabini ○ Qho ngenyanga ○ Qho ngeveki ○ Ntsuku zonke okanye Phantse ntsuku zonke
Q2.c Intsango (marijuana, pot, grass, hash, dagga, etc.)	○ Zange ○ Kanye okanye Kabini ○ Qho ngenyanga ○ Qho ngeveki ○ Ntsuku zonke okanye Phantse ntsuku zonke

Confidential

Q2.d. Cocaine (coke, crack, etc.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke
Q2.e. Amphetamine-type stimulants (speed, diet pills, ecstasy, Tik, etc.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke
Q2.f Ezitsalwa ngomoya (nitrous, glue, petrol, paint thinner, etc.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke
Q2.g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke
Q2.h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke
Q2.i. Opioids (heroin, morphine, methadone, codeine, etc.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke
Q2.j. Enye -cacisa:	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke

Kwezinyanga zintathu zidlulileyo, kukangaphi uziva unomnqweno ongamandla wokusisebenzisa (ISIYOBISI SOKUQALA,ISIYOBISI SESIBINI, NJALONJALO)?

Q3.a.Imveliso zecuba (isigareti, icuba elihlafunwayo, i-cigars, njalonjalo.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke
Q3.b. Iziselo zotywala (ibhiya, iwayini, i-spirits, njalonjalo.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke

Confidential

Q3.c.Intsango (marijuana, pot, grass, hash, dagga, etc.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke
Q3.d. Cocaine (coke, crack, etc.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke
Q3.e. Amphetamine-type stimulants (speed, diet pills, ecstasy, Tik, etc.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke
Q3.f Ezitsalwa ngomoya (nitrous, glue, petrol, paint thinner, etc.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke
Q3.g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke
Q3.h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke
Q3.i. Opioids (heroin, morphine, methadone, codeine, etc.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke
Q3.j. Enye -cacisa:	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke

Kwezinyanga zintathu zidlulileyo, kukangaphi eziziyobisi (ISIYOBISI SOKUQALA,ISIYOBISI SESIBINI, NJALONJALO) zikukhokelela kwingxaki zempilo, zoluntu, zomthetho, nezemali?

Q4.a. Imveliso zecuba (isigareti, icuba elihlafunwayo, i-cigars, njalonjalo.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke

Confidential

Q4.b. Iziselo zotywala (ibhiya, iwayini, i-spirits, njalonjalo.)	○ Zange ○ Kanye okanye Kabini ○ Qho ngenyanga ○ Qho ngeveki ○ Ntsuku zonke okanye Phantse ntsuku zonke
Q4.c. Intsango (marijuana, pot, grass, hash, dagga, etc.)	○ Zange ○ Kanye okanye Kabini ○ Qho ngenyanga ○ Qho ngeveki ○ Ntsuku zonke okanye Phantse ntsuku zonke
Q4.d. Cocaine (coke, crack, etc.)	○ Zange ○ Kanye okanye Kabini ○ Qho ngenyanga ○ Qho ngeveki ○ Ntsuku zonke okanye Phantse ntsuku zonke
Q4.e. Amphetamine-type stimulants (speed, diet pills, ecstasy, Tik, etc.)	○ Zange ○ Kanye okanye Kabini ○ Qho ngenyanga ○ Qho ngeveki ○ Ntsuku zonke okanye Phantse ntsuku zonke
Q4.f. Ezitsalwa ngomoya (nitrous, glue, petrol, paint thinner, etc.)	○ Zange ○ Kanye okanye Kabini ○ Qho ngenyanga ○ Qho ngeveki ○ Ntsuku zonke okanye Phantse ntsuku zonke
Q4.g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	○ Zange ○ Kanye okanye Kabini ○ Qho ngenyanga ○ Qho ngeveki ○ Ntsuku zonke okanye Phantse ntsuku zonke
Q4.h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	○ Zange ○ Kanye okanye Kabini ○ Qho ngenyanga ○ Qho ngeveki ○ Ntsuku zonke okanye Phantse ntsuku zonke
Q4.i. Opioids (heroin, morphine, methadone, codeine, etc.)	○ Zange ○ Kanye okanye Kabini ○ Qho ngenyanga ○ Qho ngeveki ○ Ntsuku zonke okanye Phantse ntsuku zonke
Q4.j. Enye -cacisa:	○ Zange ○ Kanye okanye Kabini ○ Qho ngenyanga ○ Qho ngeveki ○ Ntsuku zonke okanye Phantse ntsuku zonke

Kwezinyanga zintathu zidlulileyo, kukangaphi usahluleka ukwenza izinto ezilindeleke ukuba uzenze ngenxa yokusebenzisa kwakho (ISIYOBISI SOKUQALA,ISIYOBISI SESIBINI, NJALONJALO)?

Q5.a. Imveliso zecuba (isigareti, icuba elihlafunwayo, i-cigars, njalonjalo.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke
Q5.b. Iziselo zotywala (ibhiya, iwayini, i-spirits, njalonjalo.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke
Q5.c. Intsango (marijuana, pot, grass, hash, dagga, etc.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke
Q5.d. Cocaine (coke, crack, etc.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke
Q5.e. Amphetamine-type stimulants (speed, diet pills, ecstasy, Tik, etc.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke
Q5.f Ezitsalwa ngomoya (nitrous, glue, petrol, paint thinner, etc.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke
Q5.g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke
Q5.h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke
Q5.i. Opioids (heroin, morphine, methadone, codeine, etc.)	◯ Zange ◯ Kanye okanye Kabini ◯ Qho ngenyanga ◯ Qho ngeveki ◯ Ntsuku zonke okanye Phantse ntsuku zonke

Confidential

Q5.j. Enye -cacisa:

- ◯ Zange
- ◯ Kanye okanye Kabini
- ◯ Qho ngenyanga
- ◯ Qho ngeveki
- ◯ Ntsuku zonke okanye Phantse ntsuku zonke

Ingaba kukho umhlobo okanye isalamane okanye nabani na othe wabonakalisa inkxalabo ngokusebenzisa kwakho (ISIYOBISI SOKUQALA,ISIYOBISI SESIBINI, NJALONJALO)?

Q6.a. Imveliso zecuba (isigareti, icuba elihlafunwayo, i-cigars, njalonjalo.)

- ◯ Hayi, zange
- ◯ Ewe, kwizinyanga zi3 zidlulileyo
- ◯ Ewe, kodwa hayi wezinyanga zi3 zidlulileyo

Q6.b. Iziselo zotywala (ibhiya, iwayini, i-spirits, njalonjalo.)

- ◯ Hayi, zange
- ◯ Ewe, kwizinyanga zi3 zidlulileyo
- ◯ Ewe, kodwa hayi wezinyanga zi3 zidlulileyo

Q6.c. Intsango (marijuana, pot, grass, hash, dagga, etc.)

- ◯ Hayi, zange
- ◯ Ewe, kwizinyanga zi3 zidlulileyo
- ◯ Ewe, kodwa hayi wezinyanga zi3 zidlulileyo

Q6.d. Cocaine (coke, crack, etc.)

- ◯ Hayi, zange
- ◯ Ewe, kwizinyanga zi3 zidlulileyo
- ◯ Ewe, kodwa hayi wezinyanga zi3 zidlulileyo

Q6.e. Amphetamine-type stimulants (speed, diet pills, ecstasy, Tik, etc.)

- ◯ Hayi, zange
- ◯ Ewe, kwizinyanga zi3 zidlulileyo
- ◯ Ewe, kodwa hayi wezinyanga zi3 zidlulileyo

Q6.f Ezitsalwa ngomoya (nitrous, glue, petrol, paint thinner, etc.)

- ◯ Hayi, zange
- ◯ Ewe, kwizinyanga zi3 zidlulileyo
- ◯ Ewe, kodwa hayi wezinyanga zi3 zidlulileyo

Q6.g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)

- ◯ Hayi, zange
- ◯ Ewe, kwizinyanga zi3 zidlulileyo
- ◯ Ewe, kodwa hayi wezinyanga zi3 zidlulileyo

Q6.h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)

- ◯ Hayi, zange
- ◯ Ewe, kwizinyanga zi3 zidlulileyo
- ◯ Ewe, kodwa hayi wezinyanga zi3 zidlulileyo

Q6.i. Opioids (heroin, morphine, methadone, codeine, etc.)

- ◯ Hayi, zange
- ◯ Ewe, kwizinyanga zi3 zidlulileyo
- ◯ Ewe, kodwa hayi wezinyanga zi3 zidlulileyo

Q6.j. Enye -cacisa:

- ◯ Hayi, zange
- ◯ Ewe, kwizinyanga zi3 zidlulileyo
- ◯ Ewe, kodwa hayi wezinyanga zi3 zidlulileyo

Ingaba wakhe wazama ukwehlisa okanye ukuyeka ukusebenzisa esisiyobisi (ISIYOBISI SOKUQALA,ISIYOBISI SESIBINI, ISIYOBISI SESITHATHU, NJALONJALO)?

Q7.a. Imveliso zecuba (isigareti, icuba elihlafunwayo, i-cigars, njalonjalo.)

- ◯ Hayi, zange
- ◯ Ewe, kwizinyanga zi3 zidlulileyo
- ◯ Ewe, kodwa hayi wezinyanga zi3 zidlulileyo

Confidential

Q7.b. Iziselo zotywala (ibhiya, iwayini, i-spirits, njalonjalo.)	○ Hayi, zange ○ Ewe, kwizinyanga zi3 zidlulileyo ○ Ewe, kodwa hayi wezinyanga zi3 zidlulileyo
Q7.c. Intsango (marijuana, pot, grass, hash, dagga, etc.)	○ Hayi, zange ○ Ewe, kwizinyanga zi3 zidlulileyo ○ Ewe, kodwa hayi wezinyanga zi3 zidlulileyo
Q7.d. Cocaine (coke, crack, etc.)	○ Hayi, zange ○ Ewe, kwizinyanga zi3 zidlulileyo ○ Ewe, kodwa hayi wezinyanga zi3 zidlulileyo
Q7.e. Amphetamine-type stimulants (speed, diet pills, ecstasy, Tik, etc.)	○ Hayi, zange ○ Ewe, kwizinyanga zi3 zidlulileyo ○ Ewe, kodwa hayi wezinyanga zi3 zidlulileyo
Q7.f Ezitsalwa ngomoya (nitrous, glue, petrol, paint thinner, etc.)	○ Hayi, zange ○ Ewe, kwizinyanga zi3 zidlulileyo ○ Ewe, kodwa hayi wezinyanga zi3 zidlulileyo
Q7.g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	○ Hayi, zange ○ Ewe, kwizinyanga zi3 zidlulileyo ○ Ewe, kodwa hayi wezinyanga zi3 zidlulileyo
Q7.h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	○ Hayi, zange ○ Ewe, kwizinyanga zi3 zidlulileyo ○ Ewe, kodwa hayi wezinyanga zi3 zidlulileyo
Q7.i. Opioids (heroin, morphine, methadone, codeine, etc.)	○ Hayi, zange ○ Ewe, kwizinyanga zi3 zidlulileyo ○ Ewe, kodwa hayi wezinyanga zi3 zidlulileyo
Q7.j. Enye -cacisa:	○ Hayi, zange ○ Ewe, kwizinyanga zi3 zidlulileyo ○ Ewe, kodwa hayi wezinyanga zi3 zidlulileyo

Injection drugs

Ingaba wakhe wasebenzisa nasiphi na isiyobisi ngokuzitofela (EZINGESIZO ZONYANGO)?	○ Hayi, zange ○ Ewe, kwizinyanga zi3 zidlulileyo ○ Ewe, kodwa hayi wezinyanga zi3 zidlulileyo

APPENDIX G

Ethical Approval from the University of Cape Town Faculty of Health Sciences

UNIVERSITY OF CAPE TOWN
Faculty of Health Sciences
Human Research Ethics Committee

Room E53-46 Old Main Building
Groote Schuur Hospital
Observatory 7925
Telephone [021] 406 6492
Email: sumayah.arlefdien@uct.ac.za
Website: www.health.uct.ac.za/fhs/research/humanethics/forms

05 December 2016

HREC REF: 689/2016

Prof D Stein
Division of Psychiatry & Mental Health
J-2
GSH

Dear Prof Stein

PROJECT TITLE: INVESTIGATING PUPILLOMETRY AS A NOVEL MECHANISM FOR DETECTING EMOTIONAL REGULATION DIFFICULTIES IN INDIVIDUALS WITH PTSD (MMeD-candidate L Ginton) sub-study linked to 401/2009

Thank you for your response letter dated 10 November 2016, addressing the issues raised by the Human Research Ethics Committee (HREC).

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

Approval is granted for one year until the 30 December 2017.

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.
(Forms can be found on our website: www.health.uct.ac.za/fhs/research/humanethics/forms)

We acknowledge that the student, L Ginton will also be involved in this study.

Please quote the HREC REF in all your correspondence.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please note that for all studies approved by the HREC, the principal investigator **must** obtain appropriate institutional approval before the research may occur.

Yours sincerely

signature removed

PROFESSOR M BLOCKMAN
CHAIRPERSON, FHS HUMAN RESEARCH ETHICS COMMITTEE

Federal Wide Assurance Number: FWA00001637.
Institutional Review Board (IRB) number: IRB00001938

APPENDIX H
DCHS Consent Form in English

DRAKENSTEIN CHILD HEALTH STUDY
CONSENT AND INFORMATION SHEET FOR MOTHERS – MAIN COHORT
May 2016

CONSENT FORM AT YEAR 3

You and your child are invited to take continue to take part in a study that is being done in the Drakenstein sub-district, in collaboration with the Universities of Cape Town and Stellenbosch. We would like to thank you and your child for taking part in this study, we hope to impact child health and your participation will help us achieve that. The following information describes the study and you and your child's role for the next year. Please read this carefully and feel free to ask any questions.

Why is this study being done?

Lung infections and chest problems are common in young children. This study is being done to find out the effect of chest infections in the early years of life on the development of lung disease in children. The study will also look at a number of other factors that may affect your child's health.

You and your child will continue to attend occasional scheduled visits at your primary health care clinic and at Paarl Hospital. During these visits, we will assess the health of you and your child by using questionnaires and doing tests. Should your child get sick with a chest infection, then he/ she will be carefully investigated to try and find out the cause of this infection. This study will help us to better understand why children get chest illness and may help to improve child health.

Cognition and social emotional development are important parts of a child's overall health. By cognition we mean the way a child thinks, learns, plans and pays attention. Social emotional and social cognitive development refer to how a child learns to understand their own and others' emotions, and to reason about what other people think, believe and feel. We want to see how these factors develop over time. This study will help us understand how various other factors we look at in the main study impact on this development, and also how this development affects overall health.

What must I do if I agree to continue in the study?
If you agree to continue in this study, we will follow you and your child regularly to assess his/ her health. We will see you and your child at Paarl hospital when your child is about 3 years of age and again at about 4 years of age. We will also schedule a visit at 3 years of age and at 42 months at the primary health care clinic. We will ask you some questions about your child's health, nutrition, growth and development, and any chest illnesses. We will do regular tests to watch these.

At study visits in the next year, you will be asked some questions about you and your child's health. Your child will be examined. Tests will be done on you and your child to assess whether there is any chest problem. The tests that may be done on your child are:

1. Blood tests - these will be to test for allergies or blood problems.

2. A test of the mucus from the nose (nasopharyngeal swab) to test for infection.
3. Saliva will be collected to check for germs which may cause pneumonia
4. A skin test for tuberculosis infection.
5. A urine test for smoke exposure.
6. A stool test to check what germs are in the stool.
7. At 3 years and 4 years of age a breathing test will be done, to measure the air moving in and out of his/her lungs.
8. A skin test if your child has a rash
9. An eye tracking test at 3 and 5 years of age where your child will look at a computer screen showing cartoons and pictures to see how his/her attention and development occurs.

The tests YOU will be asked to complete are:

1. Questionnaires about your socioeconomic status and your levels of emotional distress, stress, life events, social support, exposure to community violence, assessment of maternal parenting styles, your and your child's emotional style and empathy and drug and alcohol use. If a mental health condition or abuse is suspected, you will be referred to the appropriate local services.
2. An eye-tracking test where you will look at a computer screen showing different baby facial expressions.
3. Neurocognitive and socioemotional assessment at 3.5 years. We will take a short video of you playing with your child, and of your child playing. We will then ask you to answer some questions about your child's feelings and behaviors, and about your own feelings and behaviors as well as any trauma or violence that you or your child may be exposed to. While you are doing this, we will be doing some tasks, games and puzzles with your child.

We will only share your test results with primary health care staff if it indicates that you or your child require treatment or further follow up. For some assessments, study staff may follow up with you and provide you with information on where you can seek help, if necessary.

Should your child get sick with a chest infection, then additional tests will be done to try and find out the cause of your child's illness. The tests that will be done will depend on how sick your child is and what the illness is. These tests may include:

1. Blood tests to test for infections, at the time of the illness, and again 4-6 weeks afterwards
2. A test of the mucus from the nose (nasopharyngeal swab) to test for infection
3 A skin test for tuberculosis infection.
4 A test of the mucus from the lungs (induced sputum test) for chest infection.
5 A urine test for smoke exposure
6 Chest X-ray
7 Breathing test
8 A ultrasound test of the lungs
9 A stool test to check what germs are in the stool.

If your child is enrolled in the study and is admitted to hospital, he/she will be followed up in hospital by a member of the study team. The study member will ask you questions about your child's illness, and some tests may be done, including a nose swab and an induced sputum. All of these tests are usual for investigating the cause of pneumonia.

What are the benefits of my child being in the study?

You and your child will be closely followed for the first few years of your child's life. Any medical illness or problem should be found soon after it develops. Your child's growth and development will be carefully followed. If an illness or problem is found then your child will be promptly investigated and treated. If your child gets sick you will be able to take him/ her to your usual health facility, where additional tests to find out the cause of your child's illness may be done, depending on how sick your child is. If your child requires hospitalisation, then he/ she will be hospitalised at Paarl hospital as is usually done. If your child is hospitalised, then one of the study staff will see your child in hospital and additional investigations may be done to try and find out the cause of the illness. Therefore the study offers an opportunity for your child to receive appropriate medical care. The study will also help us to better understand the causes of illness in children, and identify the things that may harm their health. We hope that this will lead to improvements in child health.

What are the risks to my child?

There are no major risks to your child. Your child may also become tired during the tasks, games and puzzles. To minimize this risk, we will take breaks whenever it seems your child is getting tired. There may also be some discomfort associated with some of the tests we will do. These tests are listed below:

(1) Blood tests

Your child may feel sore when blood samples are taken with a needle. Where possible an anaesthetic cream will be used to dull the pain from the needle. Some bruising may occur, but this is not harmful and will disappear. Only a small amount of blood (not more than 3 teaspoons) will be taken from your child at any time

(2) Nasopharyngeal swab

A sample of mucus will be taken from your child's nose, to test for germs that can cause chest infections and to monitor which germs are usually in your child's nose. Your child may experience minor discomfort when the nasal swab is done. Occasionally it can cause bleeding from the nose, but this is not serious, and usually stops by itself.

(3) TB skin test

A small injection is made on your child's arm. This is to test whether your child has TB or not, and will be done at regular visits. Your child will experience minor discomfort due to the needle, with the skin test. There may also be irritation of the skin if the test is positive (reactive). This test will need to be checked 2-3 days after the injection is given.

(4) Induced sputum

Your child will be given salt-water through a nebulizer to loosen the mucous in the lungs. Then a sample of that mucus will be suctioned, or your child will be asked to cough up the mucus. Your child may experience a little discomfort while the sputum test is done. He/ she may develop some coughing or have a small amount of bleeding from the nose after this. These are not serious. Occasionally this test can cause the airways of the lungs to close. If this occurs your child will be given medicine through an inhaler/nebulizer to open the airways.

(5) Breathing test

This test is done after a child recovers from pneumonia, and at the 3 year and 4 year visits at Paarl Hospital and should not cause any discomfort. A mask will be put on his/ her face and the air going in and out of his/ her lungs while breathing will be recorded.

(6) Stool test

This test may be done monthly on your child and then every 6 months after 1 year. Study staff will collect stool from your child's nappy if passed during a study visit. If there is no stool available, a small tube will be inserted into your child's bottom and some stool will be sucked out with a syringe. The tube is thin and bendable and is only put in 1-2 centimeters to reach stool. There is a very small chance of bleeding at the rectum right where the tube goes is.

(7) Ultrasound test of the lungs

This test will be done if your child develops pneumonia so as to better see how the infection is affecting your childs lungs. This is a very safe procedure and there are no side effects.

(8) Eye tracking

This test will involve your child watching a series of images to better understand their attention and development. This is a very safe test and there are no risks or side effects.

(9) Neurocognitive and socioemotional assessment at 3.5 years.

We will take a short video of you playing with your child, and of your child playing. This will take 5 – 10 minutes. We will then ask you to answer some questions about your child's feelings and behaviors, and about your own feelings and behaviors as well as any trauma or violence that you or your child may be exposed to. This will be very safe, though you or your child may become tired. We will take lots of breaks so your child can relax and play in between these tasks. We will provide you both with refreshments. In total, this visit will probably last about 2 hours.

What are the risks to you?

There are no major risks to you. Some of the questionnaires ask for sensitive information relating to mental health and this may cause some emotional distress or discomfort. Where significant issues are identified, and if you agree, study staff will offer referal to mental health support. You may also choose not to answer certain questions and still remain in the study. You will be able to take breaks, if you need to, and you will be free to terminate or reschedule the interview should the need arise.

Will I be paid to participate in the study?

No, you will not be paid to participate in this study. If you agree to take part, we will reimburse your transport costs for visits that are not part of your well child clinic visits.

Will there be any cost to participate in the study?
No, there will be no cost to you.

How long will my child be in the study?
This consent form is for permission for you and your child to participate in the study from 3 to 4 years of age. We hope to continue the study for many years; each year we will ask you again to sign permission for you and your child to continue in the study for another year.

Will my child's participation in the study be confidential?
All information that you provide will be considered confidential, and no mention of you or your child's name will appear on the stored samples or in any publication in connection with this study. No persons other than the health care workers overseeing your child's care and the study nurses and doctors will have access to any information that identifies your child personally. All your test results will not be disclosed to anyone other than for the purpose of treating you if there is a problem.

The video material will be securely stored, and only researchers directly involved in this part of the study will have access to it. This material will also be treated as very strictly confidential. Your names will not be attached to the video. The video will give us information about how you and your child interact, and about your child's behavior.

Mandatory reporting of abuse and/or deliberate neglect
The researcher(s) may not be able to keep confidential, information about known or reasonably suspected incidents of deliberate neglect or physical, sexual or emotional abuse of an adult or a child. If a researcher is given such information, he or she may report it to the authorities such as child welfare.

Does my child have to be in the study?
You can choose not to take part in the study. This will not affect the quality of care your child receives. You will be able to decline to participate at any time should any part of the study be unacceptable to you, you may still take part in the rest of the study.

What do I do if I have any questions?
If you have any questions about this study, you can ask study staff, the Principal Investigator, Professor Heather Zar, or the lung study doctor, Dr. Attie Stadler, at: 021 860 2802. For questions about your rights as a study participant call the Human Research Ethics Committee, Faculty of Health Sciences, University of Cape Town, Tel: 021-4066492

Informed Consent

1. **I, _____ understand the information contained in this consent form, as explained to me in a language that I understand. I am prepared to participate in this study and give consent for my child to participate in this study.**

I agree to allow study staff to access my medical and hospital records as well as those of my child during the course of the study.

I give consent for the filming interaction between me and my child and consent to its use for the duration of the study.

□ YES □ NO

2. To be completed by mother:

Child's Name:_____

Mother's Name:_____

Mother's Signature: _____

Date: _____

3. Study staff providing information: **Study staff confirming consent:**

Name: _____ _ Name: _____

Role in Study:_____ Role in Study:_____

Signature: _____ Signature: _____

Date: _____ Date: _____

4. If the mother is unable to read or write the entire counselling process must be observed by an independent witness who can then confirm the procedure once the mother has given consent.

Fingerprint of mother:

Witness: I confirm that I am independent of the study and that I witnessed the entire enrolment counselling process in the home language of the mother.

Name:_____

Signature: _____

Date: _____