

POSTTRAUMATIC STRESS DISORDER IN INFANCY AND EARLY CHILDHOOD

A Thesis Submitted to the College of
Graduate Studies and Research
In Partial Fulfillment of the Requirements
For the Degree of Doctor of Philosophy
In the Department of Psychology
University of Saskatchewan
Saskatoon
By

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Keywords: posttraumatic stress disorder, infants and young children, attachment

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Abstract

Traditionally, it was believed that young children did not experience long-term negative effects resulting from a traumatic experience. Many professionals continue to assume that the effects of trauma on infants (0-3 years) are transient and that intervention is unnecessary. However, research has shown that infants and young children can develop posttraumatic stress disorder (PTSD; Scheeringa, Peebles, Cook, & Zeanah, 2001). Symptoms consistent with older children and adults (i.e., re-experiencing, avoidance/emotional numbing, and hyperarousal) have been found with infants and young children exposed to trauma. The purpose of this dissertation was to better understand the nature of trauma in early childhood using a multidimensional approach. Three studies were conducted to determine the effects of trauma and PTSD on young children. Study 1 considered the effectiveness of using the Child Behaviour Checklist (CBCL), a popular measure of children's adjustment, to screen for PTSD symptoms in a sample of young children. Results suggested that the PTSD subscale of the CBCL correctly identified 71% of children with PTSD. Study 2 examined the role that potentially traumatic events, as well as family and child characteristics, play in the development of symptoms of PTSD by surveying a community sample. Results suggested that certain events were more likely to be associated with symptoms of PTSD and that children with younger mothers and higher rates of internalizing problems were more likely to experience symptoms of PTSD. Study 3 explored the effects of trauma on young children's emotional, physiological and relational functioning, and was conducted in two phases: Phase I considered PTSD symptom expression, physiological stress-response (i.e., salivary cortisol) and quality of attachment in children recruited from a community sample; and Phase II considered PTSD symptoms, quality of attachment and maternal psychological distress in the development of PTSD in a clinical sample of young children. Results found that in Phase I PTSD

symptoms were not associated with either cortisol level or quality of attachment, although effect sizes were moderate. Phase II results found a direct and significant association between quality of attachment and PTSD symptoms. A non-significant but moderate effect size was found for the link between maternal psychological distress and PTSD symptoms. Findings are discussed with regards to their implications for future research and clinical practice.

Acknowledgements

I would like to thank Dr. Margaret McKim for her guidance and inspiration. Her mentorship provided the motivation to “push on through” regardless of the challenges that were placed in front of me. Thanks also to Dr. Patti McDougall, who stepped in and generously took over supervision following the devastating loss of Margaret. Patti’s competence and incredible drive always made me feel secure, and I hope that our work together has made Margaret proud.

Thank you to the individuals who served as members of my committee over the course of my graduate studies. These include Dr. Esther Cherland, Dr. Charissa Cheah, Dr. Deb Hay, Dr. Bruce Gordon, Dr. Stephanie Martin and Dr. Deb Saucier.

I would also like to thank the clinical faculty, who went above and beyond my expectations in ensuring that my research continued despite significant challenges. Their hard work in ensuring the continuation of the Infant and Preschool Clinic in Margaret’s memory was extraordinary. Dr. Debby Lake also deserves my sincere gratitude for taking over the Clinic on such short notice. Her commitment to the Clinic was incredible and I am thankful for the opportunity to have worked with her.

My family deserves special thanks for their love and encouragement. They not only provided emotional support but also helped me to see that my life is full of opportunities. My family also provided specific contributions to my dissertation such as reading drafts, supporting me when I had doubts, contributing ideas, and listening as I described my research at length. I would also like to thank Patrick for his love. I am so grateful for his support and understanding over the past six years.

Finally, I would like to thank the Canadian Institutes of Health Research for awarding me the Doctoral Research Award. This award has allowed me to engage in research-related activities that would have been difficult without their support.

This dissertation is dedicated to Dr. Margaret McKim

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Posttraumatic Stress Disorder in Infancy and Early Childhood

Infants and young children are at risk for experiencing many different types of potentially traumatic events, from experiencing abuse and/or witnessing domestic violence to being involved in motor vehicle accidents and experiencing other accidents common to young children. Early childhood (0-48 months) is a time when developmental pathways are organizing based on genetic and environmental information. Disruptions to “normal” development, such as those resulting from the experience of a traumatic event, can have detrimental effects on children’s emotional, physiological and cognitive functioning (De Bellis & Van Dillen, 2005). A secure attachment relationship between infants and their caregivers can provide emotional and physiological stability during times of stress. The purpose of the present dissertation was threefold. To begin, I sought to explore whether children at risk for developing Posttraumatic Stress Disorder (PTSD) could be effectively identified using a widely-employed measure of childhood behavioural and emotional problems. Of additional interest was the delineation of the types of events that are traumatic for young children taking into consideration that there can be differences in the perception of threat. Finally, in the present research I examined whether children’s stress-response systems and relationships influence their reaction to a trauma. The findings from this research set down groundwork for our understanding of how best to protect developing emotional and physiological pathways in early childhood, while preventing future vulnerability to stress.

Criteria for the diagnosis of Posttraumatic Stress Disorder (PTSD) in adults and children are well established and include subjective experiences of intense fear, helplessness or horror in the face of threatened harm to oneself or others, as well as experiences of intrusive memories, avoidance to reminders of an event or emotional numbing, and hyperarousal (Diagnostic and

Statistical Manual of Mental Disorders, 4th Edition, Revised; DSM-IV-TR; APA, 2000).

Although these reactions are common experiences following exposure to a traumatic event, individuals are diagnosed with PTSD when these symptoms cause frequent problems in their functioning for longer than one month.

A significant amount of research on adult posttraumatic stress disorder has been gathered over many years. Researchers began studying men in combat during the First World War in order to understand the effects of exposure to traumatic events on humans' emotional functioning (Birmes, Hatton, Brunet, & Schmitt, 2003). After a nosology for PTSD was established based on the experiences of war veterans, researchers began studying the effects of PTSD on adult survivors of physical, sexual and emotional childhood abuse, women involved in abusive relationships and civilians during war-time (Birmes et al., 2003). The effects of trauma on older children were overlooked until about 15 years ago, but have since gained much empirical and clinical support (Fletcher, 2003).

Although there have been over 50 case reports published in the literature concerning traumatized young children (0-48 months) in the last 30 years (Scheeringa & Zeanah, 1995), the first empirical study of infant trauma was only published in 1995 (Scheeringa, Zeanah, Drell & Larrieu, 1995). The study of infant trauma and its impact on the emotional functioning, biological functioning and brain development continues to be a significantly underdeveloped area when compared to the available literature on trauma in populations of adults and older children. The reason for this paucity relates primarily to limitations in the cognitive abilities of children, in conjunction with difficulty documenting and understanding how young children process potentially traumatic information.

Infant Memory

Researchers are only now beginning to recognize the effects of early traumatic experiences on later development. A main issue that has prevented researchers and clinicians from considering the effects of trauma on young children is the belief that infants experience trauma differently from adults or older children, specifically, that the experience is transient with no long-term negative effects (Fletcher, 2003; Perry & Szalavitz, 2006). This belief is difficult to validate or refute given infants' inability to verbally relate their experiences. Even following the emergence of language, older children can often not verbally report experiences that occurred in early childhood (Terr, 1988). Through the use of clinical case reports and experimental studies with both traumatized and non-traumatized children, a growing body of evidence is emerging to demonstrate that preverbal infants do have memory of traumatic events (Terr, 1988; Howe, Courage, & Peterson, 1994; Sugar, 1992; Gaensbauer, 1995, 2002). Terr (1998) coined the term "behavioural memory" to refer to behaviours which emerge as a result of a trauma and relate to the event experienced. Evidence for "behavioural memory" is found throughout the case study literature. A common reaction to trauma described in this literature is a form of play called "posttraumatic play", in which a child repeatedly reenacts the events of a traumatic experience, detail-by-detail, without the enjoyment observed during regular play behaviour. Children who are preverbal, and even those who are not, often demonstrate "behavioural memory" of the traumatic event through their posttraumatic play.

Research has shown that infants of all ages demonstrate memory for events and situations that they have experienced, and even newborns have revealed a recognition for passages of prose that were heard prenatally, which are preferred over others shortly after birth (DeCasper & Spence, 1986). Similarly, Rovee-Collier, Schecter, Shyi and Shields (1992) demonstrated that 6-

month-olds can remember over a period of months that a foot-kick response can move a mobile. The majority of research on infant memory of trauma has focused on a child's ability to verbally relate traumatic events which occurred during the preverbal period, following the development of language abilities. This research suggests that some individuals are able to verbally relate events that occurred in infancy and others are not (Terr, 1988; Sugar, 1992). This discrepancy has resulted in the development of a number of theories to explain this phenomenon. For example, psychoanalytic theory explains infantile amnesia as repression of sexual urges at this age; cognitive psychologists describe the importance of the development of processing mechanisms for encoding and storing memories; and other researchers have suggested that language processing is required for memories to be maintained (Peterson, 2002). Although these theories outline possible mechanisms of verbal versus non-verbal memory, theories to explain infant ability to demonstrate "behavioural memory" have yet to be developed.

Case reports of infants and older children requiring treatment for severe behaviour problems related to preverbal trauma represent the majority of the evidence for the existence of behavioural memory (Terr, 1988; Sugar, 1992; Gaensbauer, 2002; Howe, Courage & Peterson, 1994; Bauer, Kroupina, Schwade, Dropik, & Wewerka, 1998; Peterson & Rideout, 1998; Perry & Szalavitz, 2006). Terr (1988) conducted the largest of these studies, involving 20 children aged between 6 and 58 months old, whom she had previously worked with and for whom she had case notes about their descriptions of specific traumatic experiences. She found that children who were younger than 28 months of age at the time of the trauma were generally unable to verbally relate their experiences when they became verbal some months later, although many of these children had spot or fragmentary memories of details for the event. Those children who were older than 28 months of age at the time of their trauma, however, were able to verbally

relate the details of their experiences as their verbal skills improved. Although only a subset of the children in this sample could verbally relate their traumatic experiences, all children demonstrated “behavioural memory” for the traumatic experience, as evidenced by reenactment of the event in play, avoidance of reminders of the event and changes in emotional functioning.

Sugar (1992) described the case of a grown woman who had a recurring nightmare for most of her life. The client remembered an anxiety-provoking scene in which her mother was standing next to some vague material on the floor. This client found out in her 30s that her mother had had a miscarriage, which this client had witnessed. Case reports suggest that memories can remain distressing well past infancy, even when they are not integrated into one’s understanding of the world (Sugar, 1992). It may be assumed that infants can be particularly vulnerable to ongoing distress because although they have memory of these traumatic events, they are unable to verbally describe their distress or understand their perceptions of danger in the context of the situation. Inability to cope with this distress may lead to the development of PTSD, often reported to lead to significant behavioural problems and mental health issues in older children and adults (Sugar, 1992; Gaensbauer, 2002; Scheeringa & Zeanah, 1995). With this in mind, it is clear that understanding the types of events and situations that may be traumatic for infants and young children can facilitate support and intervention.

Traumatic Events in Infancy

Research suggests that experiences considered traumatic by children (e.g., being left alone for a long period of time) are not necessarily traumatic for adults (Bingham & Harmon, 1996). This is particularly relevant for young children whose perceptions of threat may be different from adults as a result of their level of cognitive capacity. For example, Drell, Siegle, and Gaensbauer (1993) described a case in which a young child became very frightened when he

heard a lawnmower start. This child developed symptoms of PTSD, in that he became afraid of leaving his house, he became more clingy with his caregivers, more irritable and more fearful of previously innocuous things in his environment. Although the loud, unexpected sound of a lawnmower starting could be startling and temporarily stressful for an adult, the ability to understand the lawnmower's function would prevent this experience from being perceived as traumatic. This case illustrates the importance of considering the context of a situation in the diagnosis of PTSD for infants. Criteria A2 in the DSM-IV diagnosis of PTSD requires that an individual be exposed to an event in which they perceive their life or the life of someone close to them is threatened. Adults and older children will have a certain understanding of what type of events constitutes threat to their integrity; however, these perceptions are not necessarily the same for young children who cannot engage in discussions about threat and danger. This disparity in perceptions may be even more dramatic for infants because they have different developmental capacities (e.g., perceptual abilities, memory, social and emotional development) from older children and adults. Although infants may perceive threat in situations that are not dangerous, they may also be unaware of threats that are potentially fatal, such as brandishing a knife or firearm. To date, there has been no systematic study of what constitutes a traumatic event for young children and no clear identification of their behavioural reactions to these events. In order to understand young children's perceptions of threat and danger, one must consider the attachment relationship. Infants are dependent on their primary caregiver to ensure their survival, and when the attachment relationship is threatened (i.e., the attachment figure is unavailable) the child's safety is at risk.

Attachment Theory and Infant Trauma

Attachment theory traces its origins to the work of Bowlby (1944), who sought to explain the development of the fundamental bond between an infant and his/her primary caregiver. Bowlby was interested in understanding three easily observable and common behaviours demonstrated by infants: (a) the infant's continued effort to maintain proximity to a specific attachment figure, (b) the infant's tendency to use the attachment figure as a secure base in which to explore the surrounding environment, and (c) the infant's sudden return to the attachment figure in times of perceived danger. These behaviours are organized with the purpose of bringing or keeping the infant and caregiver in close proximity and are activated when the infant is stressed (e.g., tired, ill, frightened). The caregiver is responsible for providing nourishment, education, physiological regulation (e.g., temperature control, emotion regulation), as well as protection from danger. The caregiver's response to the child at times of stress determines the security of the attachment relationship. For example, a caregiver who consistently responds to a child's needs during times of stress will likely develop a secure relationship, whereas a caregiver who fails to do so will often have an insecure attachment relationship. Categories of attachment security were described by Ainsworth, Blehar, Waters and Wall (1978), based on interactive behaviour between the child and their caregiver to stressful experience.

It is clear that to study infant trauma requires some focus on the attachment relationship due to the dependency that a child has on his/her primary caregiver. Researchers suggest that responsive caregiving provides the infant with a method of regulating their emotional responses (Scheeringa et al. 1995), which are required to maintain homeostasis of neurochemicals in the developing brain of the infant (Schore, 2001). Laor, Wolmer, Mayes, Golomb, Silverberg, Weizman, and Cohen (1996) suggest that younger children may be more vulnerable to PTSD

because of their greater dependence on external protective factors (i.e., primary caregiver) than school-aged children and adolescents. Older children and adults have developed the capacity to regulate emotional expression. Following a traumatic experience, older children and adults can invoke coping strategies or seek support in order to deal with trauma. Infants, however, are not able to do this for themselves, and instead rely on their primary caregiver to help them cope with the frightening experience. When caregivers provide a responsive and supportive environment for infants during stress, this can act as a buffer. Alternatively, with unresponsive or unavailable caregiving, infants have limited resources to cope with their stress. Therefore, attachment theory provides an important context within which to conceptualize PTSD (i.e., the inability to resume functioning following a traumatic experience) in infants and young children.

Limitations in Infant Trauma Research

A number of limitations in the available research on infant trauma have been identified:

1. Researchers have neglected to define the concept of infant trauma. Events that have been shown to be traumatic for adults and older children have been assumed to be traumatic for infants, although no empirical research has been conducted to clearly define what constitutes a traumatic event for infants and young children.
2. The limited research that exists has not taken a multidimensional approach to studying infant trauma. The integration of the emotional and physiological effects of PTSD will give researchers and clinicians a more comprehensive understanding of the effects of PTSD in young children.
3. Although researchers have considered the moderating role of attachment security on infants' exposure to common stressful situations (e.g., maternal separation and inoculations; Gunnar, Brodersen, Nachmias, Buss, & Rigatuso, 1996), studies have not

looked at the effect of attachment security on the development of PTSD in infants exposed to severe stress.

The studies presented in this dissertation are designed to address these limitations.

The Present Program of Research

It is clear that infants have the ability to experience and remember traumatic events, and some even experience longer term effects manifested by a posttraumatic stress disorder. Understanding what constitutes a trauma in early childhood and awareness of the effects of PTSD on a young child's functioning will allow us to offer effective interventions and prevent future emotional dysfunction. With regards to the effects of PTSD, there are three main areas of empirical research that are essential to consider with infants: the behavioural manifestations of PTSD, the physiological effects of severe stress, and the importance of the attachment relationship in mediating stress. Although these areas have been studied separately, there has been little integration of the knowledge base in these three fields. The purpose of this dissertation is to take a multidimensional approach to understanding what constitutes a trauma in early childhood and to examine the emotional, physiological and relational effects of PTSD in infants and young children.

Behavioural Manifestations of Trauma

The majority of the case studies that make up the infant trauma literature report on older children or adults who did not receive treatment for a trauma experienced in infancy. Instead, these individuals began treatment much later because of behaviour problems or relationship issues that developed as a result of the unresolved trauma. There are many published clinical case reports on long-term effects of trauma in early childhood (Bowlby, 1973; Terr, 1988; Sugar, 1992; Gaensbauer et al., 1995; Gaensbauer, 2000), resulting in the emergence of systematic data

collection focused on infants' reactions to traumatic experiences. From these reports, it is becoming clear that researchers', clinicians' and even parents' earlier assumptions about the negligible longer term effects of infant trauma are false.

History of PTSD Nosology for Infants and Young Children

In 1988, Terr completed a file review study of 20 infants, between the ages of 6 and 58 months, who experienced single or multiple traumas. She was interested in studying whether young children had memory for traumatic events, even if language had not yet developed. Terr found that although experiences in infancy could not always be remembered verbally in later childhood or adulthood, "behavioural memory" was demonstrated by all individuals, irrespective of age or ability of the infant at the time of the experience. Her findings contributed greatly to the development of the field of infant trauma.

Following Terr's (1988) report, Scheeringa, Drell, Zeanah, and Larrieu (1995) conducted the first empirical study of infant trauma, obtaining cases by combining 20 cases that were identified in the published case study literature and recruiting 12 new cases. With clear evidence that infants had longer-term memory of traumatic events, the authors wanted to determine whether the DSM-IV (APA, 1994) diagnostic criteria for PTSD were appropriate for infants and young children. These authors discovered that a number of symptoms demonstrated by traumatized infants are similar to older children's and adults' symptoms of PTSD. Specifically, young children were displaying symptoms of re-experiencing the event, avoidance or emotional numbing, and hyperarousal. These authors also realized, however, that some changes were required in the criteria to ensure accurate identification of PTSD in this young population. Specifically, DSM-IV criteria are heavily dependent on subjective reports of symptoms, requiring verbalizations for 9 of the 19 criteria to be met for a diagnosis of PTSD. In order to

make the diagnostic criteria more sensitive to the capacities of infants, Scheeringa and his colleagues (1995) developed a set of alternative PTSD criteria, based on the DSM-IV, which were more observable but represented the same underlying symptoms (see Table 1). These criteria focused more heavily on behavioural responses to trauma (e.g., avoidance of activities, places or persons associated with the event, night terrors), and eliminated a number of symptoms that required subjective reports (e.g., sense of foreshortened future, inability to recall an important aspect of the event). These authors found that some of the criteria required for a PTSD diagnosis using the DSM-IV were too stringent to reliably diagnose infants. Therefore, instead of requiring at least one symptom from Criteria B (re-experiencing), at least three from Cluster C (avoidance and emotional numbing) and at least two from Cluster D (hyperarousal), only one symptom was required from each cluster for a diagnosis with the alternative criteria. In addition, Scheeringa and colleagues described a number of new symptoms specific to infants with PTSD that were different from adults and older children (e.g., new fears, new separation anxiety). The authors clustered these symptoms and labeled them Cluster E, which are also listed in Table 1. These associated symptoms were commonly found in the sample of infants who met criteria for PTSD and the authors required at least one symptom to be present from this cluster as well, for a diagnosis of PTSD.

To test these more objective criteria, Scheeringa et al. (1995) assessed 32 cases of traumatized children with both the DSM-IV criteria and the new alternative criteria. Although many of the infants examined in the study experienced severe traumas and significant problems in functioning, most did not demonstrate a sufficient number of symptoms to be diagnosed with PTSD by the DSM-IV criteria. However, when assessed using the new alternative criteria, the prevalence of PTSD in the sample of severely traumatized children was at rates similar to older

Table 1

Comparison of DSM-IV and alternative criteria for PTSD diagnosis in young children

DSM-IV Criteria	Alternative Criteria
<p>A. The person has been exposed to a traumatic event in which both of the following were present:</p> <ol style="list-style-type: none"> (1) The person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others (2) The person's response involved intense fear, helplessness or horror. Note: In children, this may be expressed instead by disorganized or agitated behavior <p>B. The traumatic event is persistently re-experienced in at least one of the following ways:</p> <ol style="list-style-type: none"> (1) Recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions. Note: In young children, repetitive play may occur in which themes or aspects of the trauma are expressed (2) Recurrent distressing dreams of the event. Note: In children, there may be frightening dreams without recognizable content (3) Acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and dissociative flashback episodes, including those that occur on awakening or when intoxicated). Note: In young children, trauma-specific reenactment may occur (4) Intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event (5) Physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event <p>C. Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by at least three of the following:</p> <ol style="list-style-type: none"> (1) Efforts to avoid thoughts, feelings, or conversations associated with the trauma (2) Efforts to avoid activities, places, or people that arouse recollections of the trauma (3) Inability to recall an important aspect of the trauma (4) Markedly diminished interest or participation in significant activities (5) Feeling of detachment or estrangement from others 	<p>A. The person has been exposed to a traumatic event in which both of the following were present:</p> <ol style="list-style-type: none"> (1) The person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others <p style="text-align: center;">Deleted</p> <p>The traumatic event is persistently reexperienced in one (or more) of the following ways:</p> <ol style="list-style-type: none"> (1) Recurrent and intrusive recollection of the event (but not necessarily distressing), including images, thoughts, or perceptions. Note: In young children, repetitive play may occur in which themes or aspects of the trauma are expressed (2) Recurrent distressing dreams of the event. Note: In children, there may be frightening dreams without recognizable content (3) Objective, behavioral manifestations of a flashback are observed but the individual may not be able to verbalize the content of the experience (4) Intense psychological distress or physiological reactivity at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event <p>C. Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by <i>one</i> (or more) of the following:</p> <ol style="list-style-type: none"> (1) Efforts to avoid activities, places, or people that arouse recollections of the trauma <p style="text-align: center;">Deleted</p> <ol style="list-style-type: none"> (2) Markedly diminished interest or participation in significant activities. Note: In young children, this is mainly observed as constriction of play (3) Feeling of detachment or estrangement from others. Note: In young children, this is mainly observed as social withdrawal

PTSD in Infancy and Early Childhood

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|--|---|
| <ul style="list-style-type: none"> (6) Restricted range of affect (e.g., unable to have loving feelings) (7) Sense of foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal life span) <p>D. Persistent symptoms of increased arousal (not present before the trauma), as indicated by at least two of the following:</p> <ul style="list-style-type: none"> (1) Difficulty falling or staying asleep (2) Irritability or outbursts of anger (3) Difficulty concentrating (4) Hypervigilance (5) Exaggerated startle response <p>E. Duration of the disturbance (symptoms in criteria B, C, and D) is more than 1 month.</p> <p>F. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.</p> | <ul style="list-style-type: none"> (4) Restricted range of affect (e.g., unable to have loving feelings) <li style="padding-left: 20px;">Deleted (5) <i>Loss of previously acquired developmental skills, such as toileting and speech</i> <p>D. Persistent symptoms of increased arousal (not present before the trauma), as indicated by <i>one</i> (or more) of the following:</p> <ul style="list-style-type: none"> (1) Difficulty falling or staying asleep (2) Irritability or outbursts of anger or extreme temper tantrums and fussiness (3) Difficulty concentrating (4) Hypervigilance (5) Exaggerated startle response. <p>E. <i>New fears and aggression. One item needed:</i></p> <ul style="list-style-type: none"> (1) <i>New aggression</i> (2) <i>New separation anxiety</i> (3) <i>Fear of toileting alone</i> (4) <i>Fear of the dark</i> (5) <i>Any other new fears of things or situations not obviously related to the trauma</i> <p>F. Duration of disturbance greater than 1 month</p> <p style="padding-left: 20px;">Deleted</p> |
|--|---|

This table has been adapted from Scheeringa et al. (2003)

children and adults (i.e., 13% were diagnosed using the DSM-IV criteria and 69% were diagnosed using the alternative criteria). Scheeringa and Zeanah (1995) developed an interview (the Posttraumatic Stress Disorder Semi-Structured Interview and Observational Record for Infants and Young Children; Infant PTSD Interview) based on these alternative criteria to more easily diagnose PTSD in infants. This assessment measure is a 20-item interview that is conducted with parents of young children. Parents are asked to indicate whether their child has experienced the different symptoms of PTSD, and also to indicate the onset of these symptoms, their frequency and the duration of these symptoms.

The next section provides a brief account of an infant trauma case seen at the Infant and Preschool Clinic at the University of Saskatchewan to illustrate some of the symptoms found with a young child with PTSD. The collection of symptom information was collected using the Infant PTSD Interview.

Brief Case Report of Infant Trauma

Adam (a false name) is a three-year-old boy who experienced a traumatic experience at the age of two years. Adam was held at gun-point by a male relative for a period of four hours and then watched as he was arrested by police. At the time, Adam was placed in a different home that provided more safety. It is reported that Adam's early childhood was chaotic and he was likely significantly neglected.

Adam's caregiver brought him in for an assessment as a result of behavioural concerns. During the interview she described a number of symptoms of PTSD from each of the separate clusters. She reported that Adam had regular night terrors, in which he would scream and cry, yelling "no, don't". The caregiver reported significant avoidance of reminders of the event, specifically toy guns and professionals that wore a uniform. Although she was very careful to

ensure that the other children in the home never had toy guns or watched television where guns may appear, she described an incident in which another child in the home brought a toy gun home from school. Adam saw the gun as it was being removed from the knapsack. He was standing in the doorway of the kitchen, shaking uncontrollably, sweating, and staring at the bag. The caregiver ran over to Adam and threw the toy gun behind the couch and went over to soothe him, at which point he slowly began to calm down. Adam's response to this event was so severe that it is likely he was re-experiencing the event (i.e., experiencing a flashback). Adam's caregiver reported that he demonstrated restricted play behaviours (e.g., little imaginative play) and affect (i.e., he was withdrawn).

Adam demonstrated many symptoms of hyperarousal including difficulty sleeping, irritability and aggression (evidenced by his biting the other children in the home), he had a short attention span and an exaggerated startle response and was hypervigilant with regards to what others were doing and where they were at all times. Adam reportedly demonstrated extreme separation anxiety and delayed language development, however, his language use improved significantly once he was placed in his new home.

This case represents a clear case of PTSD in which Adam continued to experience significant negative effects as a result of his traumatic experiences. Although Adam did not have sufficient language ability to verbally relate his experiences, his responses to reminders and his avoidance of certain people, places and objects illustrated his "behavioural memory" for the trauma.

Patterns and Severity of Infant Trauma

Scheeringa and Zeanah (1995) continued to advance the understanding of patterns and severity of PTSD symptoms in traumatized infants under 48 months of age. The sample used in this study was the same as that used in the previous study also published in 1995. The authors

were interested in studying the impact of six independent variables on the expression of symptoms of PTSD.

Research with older children and adults has shown that girls and women have higher rates of PTSD than boys or men. The authors were thus interested in determining whether gender differences in PTSD symptoms were found in the infant population. The authors then considered differences in PTSD symptoms for infants less than 18 months and those greater than 18 months. These groups were compared because 18 months is considered a pivotal point at which infant memory systems may become reorganized and consolidated (Terr, 1988). Research has shown that older children develop more severe symptoms of PTSD when the event is unexpected and is of human rather than natural design. Scheeringa and Zeanah (1995) were interested in determining whether this difference in type of event was also present in infants. Older children who are physically injured by the trauma show more symptoms than those who did not sustain an injury, and those who witness a friend or family member hurt during the trauma also exhibit more symptoms. The authors found no association of overall severity of PTSD symptomatology with gender, age, chronicity of trauma, injury status or experience of trauma. They did find, however, that infants who witnessed threat to a caregiver demonstrated more overall severity of PTSD. This study suggests the importance of considering the infant-caregiver relationship when studying infant trauma.

In 2003, Scheeringa, Zeanah, Myers, and Putnam conducted a follow up study with a new sample of traumatized infants to determine whether the alternative criteria required for a diagnosis of PTSD are reliable and valid. These researchers found that although Cluster E (Associated Symptoms) is clinically interesting, it did not effectively differentiate infants with PTSD from those without. Therefore, it is no longer required for a diagnosis of PTSD in infancy.

They also found that requiring only one symptom for Criteria D (hyperarousal) did not cause significant differences in the rate of diagnosis of PTSD, and therefore proposed requiring the presence of at least two symptoms. The result of this body of work by Scheeringa and colleagues (1995, 2001, 2003) was the acceptance of these alternative criteria, which were incorporated into the new version of the Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood: Revised Edition (DC: 0-3R; Zero to Three, 2005) for PTSD in young children.

Summary

Current research demonstrates that infants with PTSD show clusters of symptoms similar to those found in adults and older children. These symptoms tend to be manifested differently, however, as a result of developmental abilities in young children. The alternative criteria developed by Scheeringa and colleagues (1995) provide a means of diagnosing significant effects of trauma in young children by making these behaviours more objective without changing the underlying symptoms. Although other symptoms are commonly associated with PTSD in young children, these do not increase the sensitivity of diagnosing PTSD in this population and are no longer included in the criteria for PTSD.

Physiological Consequences of Trauma

It is clear that infants have memory for traumatic events and may develop PTSD, as evidenced by symptom expression that interferes with their functioning. The emotional impact of an unresolved trauma does not solely result in emotional changes, but may also result in physiological changes. Researchers have previously conducted studies looking at physiological changes that occur in young children exposed to mild stressors, such as maternal separation

Gunnar & Cheatham, 2003; Singer & Zeskind, 2001). To date, researchers have *not* studied stress-response functioning for infants with PTSD.

The section below provides a brief description of the stress-response system functioning as it relates to stress, and more specifically how cortisol, a stress hormone, functions in humans. The relevant human and animal literature on stress-response functioning following mild and more severe stressors is then presented.

Overview of Stress-Response Functioning

The stress-response system is a physiological coping response that involves the hypothalamic-pituitary-adrenal (HPA) axis. Individual differences can be seen in the functioning of this system as a result of temperament and past experiences (Glaser, 2000). The HPA axis is a physiological pathway that begins in the hypothalamus and secretes corticotrophin-releasing hormone. This hormone in turn stimulates the anterior pituitary gland to secrete a different hormone (ACTH). The ACTH is released into the blood and stimulates the cortex to produce and release the stress hormone, cortisol. A negative feedback loop functions to maintain optimal levels of cortisol circulating in the body. Cortisol is important for reactions to potential threats to the individual, and it is also important for more common daily activities, such as in energy release, in modulating immune system activity, in increased alertness, memorization and learning, and it is involved in the growth system and reproductive function (Flinn & England, 1995). Although stress-reactivity is important for survival, prolonged elevations in the stress-response system can be detrimental to individuals, causing dysregulation of the system (i.e., suppressed levels of cortisol release). Some very young animals and human infants have shown dysfunctional reactions to stress that may become enduring under some circumstances, whereas

other animals and humans seem to be able to modulate their stress-responses through maternal responsivity (Glaser, 2000).

Normal cortisol release in adults and older children follows a circadian rhythm in parallel with the light-dark cycle, so that it is at its highest level in the morning 30 minutes after awakening, decreasing throughout the day, and is at its lowest level just before bedtime. Over the course of the night, the body replenishes its supply of cortisol to be used the next day. Research suggests that newborns do not have a circadian rhythm with respect to cortisol, but that a pattern is acquired during the first months of life. Developmental changes occur in HPA activity during infancy and toddlerhood. Research has shown that infants have a functional stress response system that begins to react to stressful situations right from birth (Graham, Heim, Goodman, Miller & Nemeroff, 1999). Before about 12 weeks of age, infants show increases in cortisol activity to stressful situations much like adults (Larson, White, Cochran, Donzella, & Gunnar, 1998). After 12 weeks, but before the end of the first year, however, infants generally show suppression in cortisol activity following stressful events. Circadian rhythms of cortisol secretion begin to develop patterns consistent with the light-dark cycle and nighttime sleep rhythms. Research suggests that children who wake less during the night have more adult-like patterns of cortisol activity, and their physiological systems become organized (Larson et al., 1998). During the period when infants' stress-response systems are organizing to reflect adult-like patterns, behavioural responses (e.g., crying, fussing) to distressing situations (e.g., physical examinations) do not necessarily cause activations of their stress response system (Gunnar & Donzella, 2002). These findings suggest that stronger behavioural reactions to distressing events are not necessarily reflective of heightened physiological stress for infants. Gunnar, Brodersen, Nachmias, Buss, and Rigatuso (1996) found that insecure mother-infant attachment predicted

elevated cortisol to physical examinations following inoculations in 15 month olds. This would suggest that secure attachment relationships regulate stress-response system functioning to stressful experiences.

PTSD and Stress-Response System Functioning

Adults. Research has shown that adults exposed to stressful events have higher levels of cortisol circulating in their bodies (Yehuda, Spertus, & Golier, 2001). Research with adults diagnosed with PTSD, however, has shown them to have *decreased* levels of cortisol (Newport & Nemeroff, 2000; Neylan et al., 2005). It is, as yet, unclear whether the dysregulation of the stress-response system occurs as a result of a prolonged PTSD or whether individuals with lower cortisol are at increased risk of developing PTSD. Research has shown that adults are at greater risk of developing PTSD from a trauma if they have experienced a trauma as a child (Yehuda et al., 2001).

Children. A meta-analysis studying rates of PTSD in children and adults suggests that children are one and a half times more likely than adults to develop PTSD following a traumatic experience (Fletcher, 1996). Research studying cortisol levels in children and adolescents has generated mixed results. De Bellis et al. (1999) found that children (aged 8 to 13 years) with PTSD had higher levels of cortisol circulating in their bodies than matched controls. Carrion et al. (2002), who studied cortisol in 51 children (aged 7 to 14 years) following exposure to a traumatic event, also found that children with a history of trauma had higher cortisol levels than a matched control group. In contrast, King, Mandansky, King, Fletcher, and Brewer (2001) studied girls (aged 5 to 7 years) who were sexually abused, and found that they had lower levels of cortisol than a control group. More stringent comparisons of children who experienced a

traumatic event and developed PTSD versus those who did not may provide more consistent findings with regards to cortisol levels.

Infants. Research with normal infants experiencing stressful, day-to-day events (e.g., brief maternal separation and attending daycare) has looked at HPA axis functioning. Watamura, Donzella, Alwin and Gunnar (2003) found that infants demonstrated increases in cortisol release throughout the day when they were at daycare, but showed decreases in cortisol when they were at home. The authors speculated that HPA activation may be context-specific during infancy. These results suggest the importance of having responsive caregivers, in that they may help young children regulate their stress-response functioning while at home, while leaving them more vulnerable at daycare. Hertzgaard, Gunnar, Larson, Brodersen, and Lehman (1992) studied the effects on cortisol levels for infants exposed to novel and positive events. These authors measured cortisol in 31 infants (aged between 7.9 and 11.6 months old) before and after a mother-infant swim class. Children who were rated as demonstrating less negative and more positive emotional behaviour towards the experience showed lower cortisol levels. These results suggest that emotions serve as a major determinant influencing stress-response activity in infants.

Findings from Animal Research

Although no studies have looked at the relationship between infant trauma and physiological functioning, animal studies have been conducted to generate hypotheses as to the potential effects of trauma on human infants. The available research has found that traumatic events in early development in animals can cause significant changes in behavioural and physiological responses to stressors in adulthood, as well as structural changes in both the limbic and frontal brain areas (Meaney, Diorio, Francis, Widdowson, LaPlante, Caldui et al., 1996; Meaney,

O'Donnell, Viau, Bhatnagar, Sarrieau, Smythe, et al., 1993). Animal research thus suggests that “early environment can determine vulnerability to pathology in later life by determining the efficiency with which the animal responds to stress” (Meaney, Bhatnagar, Larocque, McCormick, Shanks, Sharma, Smythe, et al., 1996, pp. 87). Based on animal research, Schore (2001) suggests that increases in cortisol for human infants can have long-term effects on the emotion regulating limbic system. Psychobiological changes that occur as a result of trauma during the critical growth period of the limbic system may result in “characterological styles of coping that act as traits for regulating stress” (Schore, 2001, p.212), suggesting that the individual will have a maladaptive coping style to stress. These traits remain with the individual throughout childhood and into adulthood, which may cause more vulnerability to posttraumatic stress later in life. Yehuda and colleagues (2001) have found evidence of this and suggest that individuals who experience trauma in childhood are at greater risk for developing PTSD as adults.

It will be important to study the stress-regulating biological systems in human infants following exposure to severe stress to determine whether adverse early experiences can have such long-term effects. It is also important to consider factors that may moderate early adverse experiences, in order to prevent long-term physiological changes that may interfere with coping in later life.

Attachment and HPA Axis Functioning

Infants are less able than older children and adults to effectively regulate emotions, and this may put them at greater risk for dysregulation of the HPA axis (Scheeringa et al., 1995). It is the role of the primary caregiver to support the infant in regulating their emotions. Research suggests that the suppression of HPA activity to stressful situations is moderated by the quality of the

attachment relationship between the infant and primary caregiver (Gunnar & Donzella, 2002). Infants with secure attachments suppress the stress response system, presumably relying on their caregiver for support in emotion regulation. In contrast, infants with insecure attachments demonstrate increases of salivary cortisol when exposed to stressful situations.

Infants who do not have a secure attachment with a primary caregiver have increased excitotoxic neurotransmitters circulating in their bodies. Studies have shown that increases in these chemicals during early development contribute to cell death in important areas of the brain implicated in emotion regulation (Schoore, 2001). Understanding the effects of trauma during this vulnerable period of brain development and the impact of responsive caregiving to avert the detrimental structural and functional effects on the brain for traumatized infants will provide information for effective treatments.

Summary

Although maturation of the stress-response system occurs throughout infancy, infants react physiologically to emotional events, both stressful and pleasant. Based on research with traumatized young animals, it is likely that PTSD in human infants can have detrimental effects on the maturing stress-response system and the developing brain. More research is required to comprehend the physiological reactions to traumatic events in infants and the role of the primary caregiver in mediating the coping responses of young children to trauma.

Relational Trauma and Attachment Security

Attachment relationships have long been implicated in the mediation of stressful events experienced by infants (Bowlby, 1988). A secure attachment encourages children to engage in secure base behaviours and provides them with a sense of safety, even during times of stress. Insecure attachments leave infants with a sense of being unable to rely on their primary caregiver

to provide the support they may need. In addition, a secure attachment can help the infant be more resilient to negative events, whereas an insecure attachment may put an infant at risk of more developmental problems (Rutter, 1995; Sroufe, 2000). Research suggests that infants who experience responsive caregiving and have secure attachments with primary caregivers show more resilience to stress and adversity, and are better able to recover following stress. In contrast, infants with insecure and disorganized attachments are at greater risk for psychopathology in later childhood and adulthood. Specifically, resiliency is a process occurring during development rather than an individual trait (Weinfield, Sroufe, Egeland, & Carlson, 1999). A significant difference between infant trauma and trauma that occurs in later childhood and adulthood is the infant's complete dependence for his/her safety and survival on a primary caregiver.

Not only is attachment security important for the mediation of emotional experiences in infancy, parental psychopathology can also affect the response of young children following a traumatic event. Scheeringa and Zeanah (2001) reviewed 17 studies that reported on parent and child adjustment following a traumatic event. Sixteen of these studies found a significant positive association between parental functioning and child functioning following a trauma. Children who had poorer parental functioning had higher rates of PTSD, an increased number of symptoms of PTSD, higher internalizing and externalizing scores on the Child Behaviour Checklist (Achenbach, 2000) and increased depression scores. A number of parenting factors including increased parental anxiety since the event, increased general psychiatric problems in either parent, increased irritability and withdrawal within the family, less supportiveness of the child, and denial or suppression of the child's symptoms were also found to be associated with problematic child outcomes (e.g., higher rates of PTSD). Results also suggested that studies that included younger children found maternal PTSD symptoms and general psychopathology to be

associated with more PTSD symptoms in 3-4 year olds, but not in 5-year-olds, suggesting that relational effects may be more important for younger children.

Scheeringa and Zeanah (2001) found that witnessing threat to a primary caregiver was the only predictive variable of PTSD severity in an infant population when looking at six variables. These variables included experiencing a single versus chronic trauma, child injured versus not injured, witnessed event versus experienced event and child's age and gender. The authors postulate that this finding may be either because infants understand the danger inherent in a threat to their caregiver, and/or because the caregiver may become traumatized from the experience and subsequently reflect the effects of this trauma in the care they provide to their infants. These authors suggest that infants may experience symptoms of trauma without having experienced the event directly, which they termed "relational trauma".

Scheeringa and Zeanah (2001) describe three ways in which infants and parents can contribute to each other's development of PTSD. Caregivers who are traumatized themselves at the time of their infants' trauma may have difficulty being sensitive and responsive caregivers, whereby the caregiver is withdrawn and unavailable to respond to the infant's cues because of their own symptoms. They may have difficulty interacting with the child if they want to avoid reminders of the event. Clinical case reports suggest that in many cases, the caregiver's memories of past traumatic experiences are triggered in response to the infant's trauma. Her impairments will likely intensify her infant's symptoms and make treatment ineffective.

Caregivers may also become overprotective of their infants following a trauma. Their fear and guilt may compromise their caregiving. In some cases the parent may become vicariously traumatized as they imagine the infant's experience. Caregivers can also affect their infants PTSD symptoms through their preoccupation with the traumatic event. Caregivers may not be

able to eliminate thoughts of the trauma, and continuously ask the child to describe and re-enact the event. This can be frightening and re-traumatizing for infants who would naturally try to avoid the memories.

Summary

A main role of the caregiver-infant attachment relationship is to protect the child from becoming overwhelmed in response to stressful situations. Prior to the development of an infant's stress-response system, the caregiver provides the necessary coping in reaction to stressful life events. When the caregiver is not able to provide this support, either because of general psychopathology or their own PTSD symptoms, the child is at risk of developing psychopathology themselves, which may compromise the development of the stress-response system.

Description of Studies

Although detrimental effects of traumatic events in infancy were traditionally believed to have no long-lasting impact, it is now believed that this is not the case. Infants and young children develop PTSD similar to older children and adults, and require intervention to buffer the negative effects of traumatic experiences (Scheeringa et al., 2007). Infants' limited cognitive capacity raises questions about the types of events that would be considered "traumatic" for this population. Emotional symptoms are not the only effects of PTSD in infants. Physiological systems responsible for stress-reactivity can be permanently affected as a result of prolonged stress. Research has shown that the caregiver-infant attachment relationship is important for mediating infants' ability to cope with stress and to prevent HPA axis dysregulation. The three studies presented in the following section aim to take a multidimensional approach to understanding trauma in infancy, with the aim of gaining a more comprehensive understanding

of the field of infant trauma. The hope is that this research will lead to better identification of those children at risk for PTSD.

Study 1 (A PTSD Screening Tool for Infants and Young Children Using the CBCL) will explore whether a PTSD subscale of the Child Behaviour Checklist – Preschool Form (CBCL; Achenbach & Rescorla, 2000) can accurately identify infants and young children with PTSD, as measured by a semi-structured parent-report interview developed for use with this population. The ability to identify young children with symptoms of PTSD with a quick, reliable and efficient screening measure is an important step towards the appropriate treatment of infants.

Study 2 (Infant Life Events, Trauma and PTSD: Perspectives from a Community Sample) aims to understand what constitutes a traumatic event in early childhood, considering infants' inability to verbally express their subjective experience of an event. I will also explore the prevalence of exposure to traumatic events in this population using a community sample. Further, the individual child, family and contextual factors that predict which children will develop PTSD following exposure to traumatic events will be examined.

Study 3 (Trauma in Early Childhood: Emotional, Physiological and Relational Consequences) was designed to explore the multidimensional effects of stress and PTSD on young children. Specifically, the purpose of this study was to understand the relationships between PTSD symptoms, quality of attachment and stress-response functioning. Two phases were conducted: a pilot phase involving a community sample and a second phase which included a sample of young children seeking psychological services at an infant and preschool clinic.

Study 1: A PTSD Screening Tool for Infants and Young Children Using the CBCL

Infants and young children's inability to verbally relate details of a traumatic event and to retrieve early memories of an event have made it difficult for professionals to identify those children at risk for developing PTSD. However, research has shown that infants and young children can, and do, develop symptoms of posttraumatic stress disorder when exposed to a traumatic event (Scheeringa, Zeanah, Drell & Larrieu, 1995; Scheeringa, Peebles, Cook, & Zeanah, 2001; Scheeringa, Zeanah, Myers, & Putnam, 2003; DC: 0-3R, Zero to Three, 2005). This research has also demonstrated that symptom clusters consistent with older children and adults (i.e., re-experiencing, numbing of responsiveness, and increased arousal) have been documented in infants and young children. Scheeringa, Zeanah, Drell, and Larrieu (1995) developed alternative criteria for PTSD in infancy to make diagnosis more appropriate for preverbal children. These alternative criteria have been included in the Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood: Revised Edition (DC: 0-3R; Zero to Three, 2005). Although a method of diagnosing PTSD exists, this requires a lengthy and in-depth interview and assumes that an event has been recognized and acknowledged by caregivers. The ability to identify children at risk with a quick, reliable and efficient screening measure is an important step in the appropriate provision of services to infants and young children, and will lead to a greater recognition and understanding of infant trauma.

The Child Behaviour Checklist (CBCL; Achenbach & Rescorla, 2000) is a popular measure used by health professionals to identify emotional and behavioural concerns in children.

Administration of this test is easy and does not require specific training (Achenbach & Rescorla, 2000). Use of the CBCL to screen for PTSD in older children has been shown to be effective. Wolfe, Gentile and Wolfe (1989) developed a subscale for PTSD, using 20 items from the CBCL

(School-Age Form) that corresponded to symptoms of PTSD from the Diagnostic and Statistical Manual, Third Edition (DSM-III; American Psychiatric Association, 1987). The authors compared CBCL subscale scores for 71 sexually abused children, aged 5 to 16 years, with subscale scores obtained by the CBCL normative sample and found significant differences in mean scores between the abused children and those from the normative sample. They determined that the subscale could be used to differentiate traumatized versus non-traumatized children.

Ruggiero and McLeer (2000) expanded on this research and used the CBCL subscale with a group of school-aged sexually abused children and compared rates of PTSD to those obtained by a semi-structured interview (K-SADS-E; Orvaschel, 1988). These authors found the PTSD subscale on the CBCL to be useful in screening children with PTSD, however, they determined that the subscale did not have sufficient discriminant validity to differentiate between sexually abused children and non-sexually abused children with other psychiatric problems. It is important to note that these authors used a continuous score (aggregated across all 20 items) as opposed to grouping CBCL items within the three symptom clusters. A diagnosis of PTSD in infants and young children (Scheeringa & Zeanah, 1995) requires an individual to have a certain number of symptoms from each cluster (i.e., one symptom from the reexperiencing cluster, one from the avoidance and emotional numbing cluster and two from the increased arousal cluster). Ensuring that participants demonstrate symptom patterns consistent with a diagnosis of PTSD will provide more validity to the PTSD subscale. As well, the overlap between PTSD and other psychiatric problems is common in traumatized populations so differentiating between subgroups (e.g., sexually abused and non-sexually abused with psychiatric problems) may not be realistic in a quick screening tool.

Dehon and Scheeringa (2006) examined the effectiveness of Wolfe, Gentile and Wolfe's (1989) PTSD subscale with a preschool sample who had experienced different types of traumatic events (e.g., motor vehicle accidents, invasive medical procedures, witnessing domestic violence etc.). The authors modified the subscale by eliminating five items from Wolfe and colleagues' subscale because the items were not present on the Preschool-Age Form. Therefore the new subscale consisted of 15 items instead of the original 20 items. Dehon and Scheeringa's sample included 62 traumatized children between the ages of 23 months and 6 years. In order to determine the effectiveness of the PTSD subscale, symptoms were recorded using the CBCL subscale and then compared to symptom scores using the Posttraumatic Stress Disorder Semi-Structured Interview and Observational Record for Infants and Young Children (Infant PTSD Interview; Scheeringa & Zeanah, 1995). The authors found that the PTSD subscale of the CBCL was an effective screen in that scores were significantly higher for children with a diagnosis of PTSD on the Interview. The present study is an extension of Dehon and Scheeringa's work with infants and young children.

Dehon and Scheeringa's (2006) PTSD subscale was based on criteria derived using the DSM-III. Two important developments in the study of PTSD have occurred since Wolfe and colleagues published their research in 1989: the introduction of the DSM-IV-TR (APA, 2000) and the creation of alternative criteria for PTSD in young children (Scheeringa, Peebles, Cook, & Zeanah, 2001). The PTSD subscale derived from the CBCL for use in the present study includes items from the CBCL (Preschool Form) that reflect these changes in the literature. See Table 2 for a comparison of the CBCL items used in studies by Wolfe, Gentile and Wolfe (1989), Scheeringa and Dehon (2006), and the present study.

Table 2

Comparison of items used in the PTSD subscale of the CBCL

Wolfe, Gentiles & Wolfe (1989)	Dehon & Scheeringa (2006)	Hatton (2008)
1. Argues a lot	1. Defiant	1. Cannot concentrate or cannot pay attention for long
2. Cannot concentrate or cannot pay attention for long	2. Cannot concentrate or cannot pay attention for long	2. Fears certain animals, situations, or places other than school
3. Cannot get his/her mind off certain things, obsessions	3. Clings to adults or too dependent	3. Has trouble getting to sleep
4. Clings to adults or too dependent	4. Fears certain animals, situations, or places other than school	4. Nervous, high-strung, or tense
5. Fears certain animals, situations, or places other than school	5. Nervous, high-strung, or tense	5. Nightmares
6. Feels others are out to get him/her	6. Nightmares	6. Seems unresponsive to affection
7. Nervous, high-strung, or tense	7. Too fearful or anxious	7. Shows little affection toward people
8. Nightmares	8. Nausea and feels sick	8. Shows little interest in things around him/her
9. Too fearful or anxious	9. Stomachaches and cramps (without medical cause)	9. Stares into space or seems preoccupied
10. Feels too guilty	10. Vomiting and throwing up (without medical cause)	10. Stubborn, sullen or irritable
11. Headaches	11. Stubborn, sullen, or irritable	11. Sudden changes in mood or feelings
12. Nausea and feels sick	12. Sudden changes in mood or feelings	12. Wakes up often at night
13. Stomachaches and cramps	13. Wakes up often at night	13. Withdrawn, doesn't get involved with others
14. Vomiting and throwing up	14. Unhappy, sad, and depressed	
15. Secretive and keeps things to self	15. Withdrawn and does not get involved with others	
16. Stubborn, sullen, or irritable		
17. Sudden changes in mood or feelings		
18. Trouble sleeping		
19. Unhappy, sad, and depressed		
20. Withdrawn and does not get involved with others		

Wolfe and colleagues' (1989) PTSD subscale included some associated symptoms found with PTSD that are not included in the diagnostic criteria (e.g., "Stomachaches and cramps", "Vomiting and throwing up" and "Nausea and feels sick"). Although associated symptoms are useful clinically, they do not necessarily contribute to sensitivity in identifying PTSD. This was observed during the development of the alternative criteria for infant PTSD. Scheeringa and colleagues (2001) originally published research on symptom clusters found with young children and included a cluster not found with older children and adults, comprised of symptoms such as aggression, new fears and separation anxiety. In a follow up study (Scheeringa, Zeanah, Myers & Putnam, 2003), the authors determined that although these symptoms often co-occur with PTSD in young children, this cluster did not increase the sensitivity of diagnosis and the authors decided to eliminate these symptoms from the criteria. Therefore, items that do not directly represent symptoms have not been included in the proposed PTSD subscale.

Given that one objective of Study 1 was to explore the usefulness of the screening measure in a range of populations, a clinical sample was utilized in which some children experienced a trauma while others were referred for behavioural or developmental concerns. Previous studies using the CBCL as a screening tool only included traumatized children (Wolfe et al., 1989; Ruggiero and McLeer, 2000; Scheeringa & Dehon, 2006). In fact, Dehon and Scheeringa (2006) restricted their sample to include only those children who demonstrated at least one symptom of PTSD prior to including them in the study. The present study aimed to provide information about the usefulness of the CBCL in populations where a trauma has not necessarily been identified prior to assessment.

Dehon and Scheeringa (2006) noted a limitation in their study in that two symptoms from the DC: 0-3R criteria were not included in the PTSD subscale that they used in their study. The

first item is related to the child's lack of interest in significant activities. In Study 1, this item on the CBCL (i.e., "Shows little interest in things around him/her") was included in order to more closely represent the DC: 0-3R criteria for PTSD. Dehon and Scheeringa also neglected symptomatology related to having an increased startle response, however, there is no CBCL item that represents this symptom. Accordingly, the item "Shows exaggerated startle response to unexpected events (e.g., noise)" was included with the CBCL in order to determine whether the inclusion of this item increases the sensitivity PTSD subscale.

The purpose of this study was to evaluate the effectiveness of a new screening tool to identify infants and young children at risk for PTSD. Specifically, the objectives of this study were to: (a) determine the effectiveness of using a PTSD subscale from the CBCL that corresponds with the DC: 0-3R criteria for PTSD in infants and young children, (b) determine whether certain factors (i.e., demographics, quality of attachment and maternal psychological distress) help explain why some infants and young children are incorrectly identified using the PTSD subscale of the CBCL, (c) determine whether symptom clusters captured by the PTSD subscale are related to symptom clusters on the PTSD Interview, and finally (d) determine whether the introduction of an item representing the symptom of exaggerated startle response can increase the ability of the PTSD subscale to identify those children at risk for PTSD.

Method

Participants

A clinical sample was recruited from an infant and preschool clinic situated in a university Psychology Department in a medium-sized Canadian city. The clinic offered free services to young children with behavioural or developmental concerns and their families, and provided training for graduate students in clinical psychology. Referral sources were encouraged to refer

young children who had experienced potentially traumatic events. Self-referrals were also accepted, and a brochure outlining the clinic's services for children who had experienced traumatic events was widely distributed. In order to provide families with a comprehensive assessment and focused intervention, families were asked to attend 4-6 sessions to collect information and plan treatment. See Appendix A for a list of assessment activities at each session.

From May 2005 through August 2007, the clinic received a total of 42 referrals; of these, 12 families did not complete the assessment and 9 additional families did not have enough data to be included in the study. Parts of the assessment protocol were omitted for some families when they were not pertinent to the provision of clinical services (e.g., the PTSD Interview was not conducted when there was no evidence that the child had experienced a traumatic event using the Infant Life Events Scale). The remaining 21 eligible participants all gave informed consent (Appendix B) to be included in a research program about the effects of stressful events on young children. See Table 3 for a description of demographic variables of this sample.

Measures

Parents were asked to complete a number of questionnaires related to their young child and themselves, including a demographics questionnaire (see Appendix C) to collect information about the child's age, gender, ethnic background and amount of time spent in out-of-home child care, as well as family income, primary caregiver's years of education and age of the biological mother. Other questionnaires that were used to collect information are described below.

Child Problems. Parents completed the Child Behaviour Checklist - Preschool Form, for ages 1½ to 5 years (CBCL, Achenbach & Rescorla, 2000) prior to attending the clinic for an interview. The CBCL is a 100-item parent-report questionnaire that has been standardized to

Table 3

Demographic Variables for Clinical Sample for Study 1

Variable	Clinical Sample (n = 21)
Mean age in months (SD)	39.1 (1.2)
Gender	
Female (%)	23.8
Male (%)	76.2
Ethnicity*	
First Nations (%)	15.0
Caucasian (%)	60.0
Metis (%)	25.0
Asian (%)	0
Primary Caregiver's Years of Education	13
Annual Family Income**	25,000 – 34,999

* One participant in the clinical sample declined to answer this question; therefore the results only include those who provided information about the child's ethnicity.

** Three participants in the clinical sample declined to answer this question; therefore the results only include those who provided information about their annual income.

measure children's behavioural and emotional problems. The CBCL has three domains, an Internalizing Subscale that is comprised of problems that are mainly within the self (i.e., anxiety, depression etc.). The Externalizing Subscale is comprised of problems that mainly involve conflicts with other people and their expectations for the child (e.g., aggression, hyperactivity etc.). The third domain is the Total Problems Score and is the sum of scores on all the problem items of the measure. The authors reported that the test-retest reliability across all scales was an average of .85 and cross-informant correlations between mothers and fathers was significant for the Total Problem Scores ($r = .65$) with no significant mean differences found for scaled scores (Achenbach & Rescorla, 2000). With regards to validity, content validity was found to be satisfactory (Achenbach & Edelbrock, 1981). Criterion-related validity was found to be acceptable in that the problem scales were able to discriminate between referred and non-referred children (Achenbach & Rescorla, 2000). Finally, the authors reported that the CBCL had adequate construct validity in that the problem scales demonstrated concurrent and predictive associations with other measures (e.g., Richman BCL; Richman, Stevenson, & Graham, 1982 and DSM Criteria; Keenan and Wakschlag, 2000).

The CBCL has been shown to be reliable and valid in over 50 cultural groups (Crijnen, Achenbach & Verhulst, 1997, 1999). However, the CBCL has not been shown specifically to be valid with children of First Nations and Métis backgrounds, cultures which make up a significant portion of the sample in the present study.

A subset of items from the CBCL was used to represent symptoms of PTSD and a subscale was developed to act as a screening measure for the disorder. Table 4 lists the thirteen CBCL items that correspond to symptoms of PTSD from the DC: 0-3R. The new symptom that represents an increased startle response is shown in italics ("Exaggerated startle response to

Table 4

Alternative Criteria for PTSD from the DC: 0-3R with Corresponding CBCL Items

	Alternative Criteria	CBCL Items
1.	The child has been exposed to a traumatic event – that is, an event involving actual or threatened death or serious injury to the physical or psychological integrity of the child or another person.	None
2.	<p>The child shows evidence of REEXPERIENCING the traumatic event(s) by at least one of the following:</p> <p>(a) Posttraumatic play – that is, play that (1) represents a reenactment of some aspect of the trauma, (2) is compulsively driven, (3) fails to relieve anxiety, and (4) is more literal and less elaborate and imaginative than usual.</p> <p>(b) Recurrent and intrusive recollection of the traumatic event outside play – that is, repeated statements or questions about the event that suggest a fascination with the event or preoccupation with some aspect of the event. Distress is not necessarily apparent.</p> <p>(c) Repeated nightmares, the content of which may or may not be linked to the traumatic event.</p> <p>(d) Physiological distress, expressed in language or behaviour, at exposure to reminders of the trauma.</p> <p>(e) Recurrent episodes of flashbacks or dissociation – that is, reenactment of the event without any sense on the child’s part as to the source of the ideas. The behaviour is dissociated from the child’s intentionality or sense of purpose. This symptom may also present as staring or freezing.</p>	<p>Nightmares</p> <p>Stares into space or seems preoccupied</p>
3.	<p>(a) The child experiences a NUMBING OF RESPONSIVENESS or interference with developmental momentum. The numbing or developmental problem appears or intensifies after the trauma and is revealed by at least one of the following symptoms:</p> <p>(b) Increased social withdrawal</p>	Withdrawn, doesn’t get involved with others

	<p>(c) Restricted range of affect</p> <p>(d) Markedly diminished interest or participation in significant activities including play, social interactions, and daily routines.</p> <p>(e) Efforts to avoid activities, places, or people that arouse recollection of the trauma, including efforts to avoid thoughts, feelings and conversations associated with the trauma.</p>	<p>Seems unresponsive to affection Shows little affection toward people</p> <p>Shows little interest in things around him/her</p> <p>Fears certain animals, situations, or places.</p>
<p>4.</p>	<p>After a traumatic event, a child may exhibit symptoms of INCREASED AROUSAL, as revealed by at least two of the following:</p> <p>(a) Difficulty going to sleep evidenced by strong bedtime protest, difficulty falling asleep or repeated night waking unrelated to nightmares.</p> <p>(b) Difficulty concentrating</p> <p>(c) Hypervigilance</p> <p>(d) Exaggerated startle response</p> <p>(e) Increased irritability, outbursts of anger or extreme fussiness, or temper tantrums</p>	<p>Has trouble getting to sleep Wakes up often at night</p> <p>Can't concentrate, can't pay attention for long</p> <p>Nervous, high-strung, or tense</p> <p><i>Exaggerated startle response to unexpected events (e.g., noise)</i></p> <p>Stubborn, sullen, or irritable Sudden changes in mood or feelings</p>

unexpected events (e.g., noise)"). The PTSD subscale items of the CBCL were recorded for each child. Parents responded on a 3-point scale where 0 = not true (as far as you know), 1 = somewhat or sometimes true, and 2 = very true or often true. Symptoms of PTSD were considered present if parents indicated that an item on the CBCL was "somewhat or sometimes true" and "very true or often true". The subscale is composed of 13 items and scores can range from 0-26. In order to meet criteria for PTSD on the PTSD subscale, participants were required to endorse at least one item from each of the Re-experiencing and Avoidance/Emotional Numbing clusters, and at least two items from the Increased Arousal cluster. The PTSD subscale on the CBCL was found to have adequate internal consistency for this sample (Cronbach's $\alpha = .85$).

Early Childhood PTSD. Parents participated in an interview to record symptoms of PTSD in the sample. Using the Posttraumatic Stress Disorder Semi-Structured Interview and Observational Record for Infants and Young Children (Infant PTSD Interview; Scheeringa & Zeanah, 1995; Appendix D), clinicians asked parents about symptoms that are consistent with a diagnosis of PTSD, based on the alternative criteria from the DC: 0-3R. Both a total score and a diagnosis were determined using this interview. The Total Score was determined by summing scores on a three-point scale for 15 items, where 0 = no, 1 = somewhat or sometimes and 2 = yes in response to whether a symptom was present, with the total score ranging from 0 to 30. The internal consistency score for the Total Score was found to be .79. The Total Score indicated the severity of the PTSD symptoms, and a diagnosis (PTSD present/absent) was derived when a child met criteria for each symptom cluster (see Table 1 for diagnostic criteria for PTSD in infants and young children). This interview has been used for both research and clinical purposes to gather information about PTSD in young children. Scheeringa, Zeanah, Myers and Putnam

(2005) reported on their inter-rater reliability and found that for all PTSD items Cohen's κ was 0.75, and it was 0.79 for scoring enough items to meet the alternative diagnostic threshold.

Quality of Attachment. The Attachment Q-Sort (AQS, Waters, 1987; Appendix E) measures the quality of an attachment relationship between a young child and their caregiver. The original Q-Sort was designed to be used by trained observers during 2-3 home visits. The Q-Sort has been shown to have good inter-rater agreement (ranging from .72 to .95), moderate convergent validity with the Strange Situation (ranging from .25 to .50), and moderate stability (ranging from .23 to .53) (Solomon & George, 1999). The authors of the Q-Sort considered the effectiveness of asking parents to do the sort and found the reliability and validity of this method to be satisfactory. Results suggested that inter-rater reliability for trained observers and parents for each item had an average κ of .80 (Waters & Deane, 1985). The AQS has been studied cross-culturally and findings suggest that the structure of the data is similar across different cultures, however, the patterning of secure base behaviour is affected by cultural influences resulting in low correlations of sorts across cultures (Solomon & George, 1999).

Researchers recommend that parents should be given the Q-Sort cards ahead of time and ask them to sort the cards into a high, medium and low pile prior to completing the full sort (Waters & Deane, 1985). This is to increase parents' familiarity with the items before sorting them. The Q-sort method is as follows: the parent is asked to read through 90 cards, describing different child behaviours. The parent sorts these 90 cards into 9 piles with 10 cards each, from "most like child" to "least like child". These behaviours are then compared to a criterion sort that represents the ideal attachment relationship. A correlation is provided based on the relationship between the participant's score and that of the criterion sort. The score represents the quality of attachment between the child-caregiver dyad and can range between 1 and -1. Higher scores represent better

quality of attachment, as the child's reported behaviours are more closely associated with the "ideal attachment relationship".

Maternal Psychological Distress. Psychological symptoms were measured for primary caregivers (i.e., mothers) using the Brief Symptom Inventory (BSI; Derogatis, 1993). The BSI was normed on adult non-patients, adult psychiatric outpatients and inpatients. Fifty-three items were rated on a five-point scale, ranging from "not at all" (0) to "extremely" (4). The BSI has nine subscales reflecting different psychological symptom dimensions (i.e., Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation and Psychoticism). The measure of symptomatology used in the main analyses for Study 1 was the Global Severity Index, which reflects a total score on the BSI. The higher the index score, the greater the psychological distress experienced by the participant. The Global Severity Index was found to have adequate internal consistency for the sample (Cronbach's $\alpha = .96$).

The BSI has been shown to have good reliability and validity and has been used in over 400 research studies. Internal consistency for all nine dimensions was found to be very good, ranging from .71 to .85 (Derogatis, 1993). These authors also demonstrated good test-retest reliability, with the Global Severity Index having a correlation of .90 across a two-week interval. With regards to validity, Derogatis (1993) demonstrated that the test has good convergent validity (e.g., associated with the MMPI; Wiggins, 1966) and content validity. Similarly, the BSI demonstrated adequate predictive validity in many different populations (e.g., cancer patients, pain patients, elderly patients and adults with general mental health concerns).

Results

Is the PTSD subscale related to the PTSD Interview?

A Pearson's chi-square test was conducted to determine whether diagnosis on the PTSD subscale was related to diagnosis on the Infant PTSD Interview (Table 5). There was a significant relationship between diagnosis on the PTSD subscale and diagnosis on the PTSD Interview, $\chi^2(19) = 4.677, p = .031$. The Phi coefficient indicated a positive relationship, $\phi(19) = .472, p = .031$.

The results of an analysis of variance (ANOVA) revealed that mean PTSD subscale Total Score differed significantly, $F(1, 34) = 1.454, p < .000$, for those young children with PTSD ($n = 7, M = 9.81, SD = 5.34$) versus those without a diagnosis ($n = 14, M = 3.40, SD = 5.34$), suggesting that the PTSD subscale Total Score was able to differentiate between groups of children with PTSD and those without.

Is the PTSD subscale of the CBCL an effective screening measure?

Results show that overall the PTSD subscale correctly identified PTSD in 71% of cases. Specifically, the subscale was determined to have a sensitivity of 86% (6 of 7 participants were correctly classified as having PTSD) and a specificity of 64% (9 of 14 participants were correctly classified as having no PTSD). False positives were found in 24% ($n = 5$) of the full set of cases (i.e., the CBCL identified the presence of PTSD, whereas scores on the PTSD Interview were not consistent with a diagnosis) and only 5% of cases ($n = 1$) were found to be false negatives (i.e., the PTSD interview diagnosed PTSD, whereas the CBCL did not).

In order to explore what may have contributed to the 24% of cases resulting in false positives, descriptive analyses were conducted to compare variables for two groups: True Negative Group represented those cases which were correctly identified as *not* having a diagnosis with both the PTSD Interview and the PTSD subscale of the CBCL ($n = 9$) and the False Positive Group represented those cases which did not have a diagnosis on the PTSD Interview, but were

Table 5

Number of Cases Identified as PTSD and No-PTSD using the Interview and Subscale

		PTSD Interview	
		PTSD	No-PTSD
CBCL PTSD Subscale	PTSD	6	5
	No-PTSD	1	9

identified as having PTSD on the subscale ($n = 5$). Mean scores were compared on measures of demographics, parental factors, child factors and parent-child factors (see Table 6). Results suggest that mean differences were found for mother's biological age, $t(1, 12) = -2.321, p = .043$, for the True Negative Group ($n = 9, M = 32.9, SD = 4.34$) and the False Positive Group ($n = 5, M = 26.6, SD = 4.98$). Similarly, Internalizing scores on the CBCL also displayed significant mean differences, $t(1, 12) = 2.811, p = .039$, for the True Negative Group ($n = 9, M = 9.56, SD = 5.46$) and the False Positive Group ($n = 5, M = 26.20, SD = 12.60$). Specifically, those children identified as having PTSD with the PTSD subscale of the CBCL but not receiving a diagnosis with the PTSD Interview had, on average, younger mothers and higher internalizing scores on the CBCL Internalizing Subscale compared to those children who did not have a diagnosis of PTSD on either measure.

In order to determine if using a more stringent cut-off for inclusion of items on the PTSD subscale would affect false positive rates, analyses were conducted using only those items endorsed as being "very true or often true" (as compared to including items endorsed as either "sometimes true or somewhat true" and "very true or often true" as used in the previous analyses). Results showed that when the more stringent cutoff was used (i.e., only those items endorsed as "very true or often true"), sensitivity was found to be 14% and specificity was found to be 92% (see Table 7). The significantly lower sensitivity of the subscale using the more stringent cutoff suggests that it is important to include those items on the CBCL that are endorsed as being "somewhat or sometimes true" and "very true or often true" when screening for PTSD using the subscale.

Table 6

Variables differentiating false positive cases from correctly identified cases using the PTSD subscale

	True Positive Group (<i>n</i> = 9)	False Positive Group (<i>n</i> = 5)
Demographics		
Child's Age	33.78 (10.05)	43.40 (7.13)
Biological Mother's Age	32.86 (4.34)	26.60 (4.98)*
Caregiver's Years of Education	5.11 (1.76)	4.40 (1.34)
Time in Child Care	15.0 (18.46)	21.0 (16.19)
Family Income	6.13 (3.27)	4.25 (3.27)
Parental Factors		
BSI (Global Severity Index)	.44 (.35)	1.41 (1.08)
PSI (Parent Total)	147.88 (40.56)	170.00 (7.62)
Child Factors		
PSI (Child Total)	124.25 (24.18)	140.75 (16.56)
CBCL (Internalizing Subscale)	9.56 (5.46)	26.20 (12.60)*
CBCL (Externalizing Subscale)	23.11 (9.85)	31.20 (14.45)
Total Trauma Events	1.89 (.781)	3.20 (1.79)
Relationship Factor		
Attachment Q-Sort	.215 (.25)	.149 (.25)

* $p < .05$

Table 7

Number of Cases Identified as PTSD and No-PTSD using the Stringent Cutoff

		PTSD Interview	
		PTSD	No-PTSD
CBCL PTSD Subscale	PTSD	1	1
	No-PTSD	6	13

Are the symptom clusters on the PTSD subscale associated with those in the PTSD Interview?

In order to determine whether symptom clusters captured by the PTSD subscale are related to symptom clusters on the PTSD Interview, correlations were conducted between items representing symptom clusters on both measures (i.e., Re-experiencing, Numbing of Responsiveness and Increased Arousal). The item representing an increased startle response, from the Increased Arousal cluster, was not included in this analysis. The Re-experiencing, $r(19) = .48, p = .029$ and Numbing of Responsiveness, $r(19) = .48, p = .029$, clusters were both significantly correlated, whereas the Increased Arousal cluster correlation was not significant, $r(19) = .38, p = .093$. It is important to note that the small sample size limits the power of the analysis and a sample size of 39 would have been required to see a significant effect, assuming the relationship remained constant (Faul, Erdfelder, Lang, & Buchner, 2007). In order to explore the effect of including the item representing the symptom of an increased startle response, analyses were re-run using the PTSD subscale score with this item included. Results suggest that adding this item to the PTSD subscale did not increase the sensitivity of identifying PTSD (i.e., no other cases were correctly or incorrectly identified in either sample). However, when this item was added to the Increased Arousal cluster and a correlation was performed between the PTSD subscale and the PTSD Interview, a significant correlation was found, $r(19) = .45, p = .047$. This finding suggests that the introduction of the increased startle response item increases the relationship between the Increased Arousal PTSD subscale of the CBCL and the PTSD Interview.

Discussion

Limited understanding of the effects on young children of exposure to traumatic events leads to infants in the community not being identified and therefore not receiving services for

posttraumatic stress disorder. The ability to identify those children that may be at risk of developing, or have developed, a PTSD using a quick, reliable and efficient screening measure is an important step in the appropriate provision of services to infants and young children, and will contribute to a greater understanding of the effects of infant trauma. The purpose of Study 1 was to determine whether a subscale of items from the Child Behaviour Checklist could be used as a screening tool for PTSD in infants and young children. Specifically, the study aimed to determine whether the subscale correctly identified cases of PTSD, to examine the factors that might impede correctly identifying all the cases of PTSD, to determine whether the symptom clusters present in PTSD are related for both the interview and subscale, and finally, whether adding an item not present in the CBCL to represent exaggerated startle response increased the ability to correctly identify PTSD.

Findings suggest that the PTSD subscale was able to identify children at risk for PTSD. First, the subscale was found to have good internal consistency, suggesting that the items work well together within the measure and appear to represent the same construct. Second, cases of PTSD/no PTSD on the subscale were found to be significantly associated with cases of PTSD/no PTSD on the interview suggesting that concurrence in identification using the subscale is not based on chance. Third, item clusters were found to be significantly correlated on both measures, suggesting that the items of the subscale accurately represent diagnostic symptoms of PTSD. These analyses provide validity for the use of the subscale as a screening measure.

For a screening measure to be useful, it is important to consider the number of cases that are correctly and incorrectly identified using the measure. The subscale showed a sensitivity of 86% (6 of 7 participants correctly identified as having PTSD) and a specificity of 64% (9 of 14 participants correctly identified as not having PTSD). Overall, 71% were classified correctly.

The subscale did not correctly identify 29% of cases, with five cases being found to be false positives and one case being a false negative. Although the subscale did not correctly identify all the young children with and without PTSD, it did identify the majority of cases. In establishing a screening measure, it is better to over-identify children who may be at risk for PTSD than to overlook cases that may require intervention (i.e., better to have false positives than false negatives).

In order to determine what may have contributed to increases in the rate of false positives in this study, demographic, child and relationship factors were considered for those children correctly identified as not having PTSD with the Interview and the subscale (True Negative Group) and those not having PTSD with the interview, but meeting criteria using the subscale (False Positive Group). Results showed that children who had younger mothers and those with higher Internalizing scores on the CBCL were more likely to be incorrectly identified using the subscale.

One explanation for why younger mothers had children with higher rates of PTSD symptoms may be that these mothers were less knowledgeable about normal development (as they are less likely to have multiple children) and therefore endorsed more symptoms commonly found with PTSD. Alternatively, the younger mothers may have had more anxiety about raising their children and this anxiety may have been transferred to their young children, which was reflected in the children's higher internalizing scores on the CBCL. Research has shown that children born to adolescent mothers are at greater risk of developing internalizing problems, both because of the stress on the mothers of raising children at such a young age, as well as because of the mother's personal characteristics that were predictive of early childbearing (Jaffee, Caspi,

Moffitt, Belsky, & Silva, 2001). These factors may be similar for the young mothers in the present study.

Internalizing scores on the CBCL were found to be higher for those children incorrectly identified compared to children correctly identified for PTSD using the subscale. PTSD is an anxiety disorder, in that the individual has increased and ongoing fear and worry following a traumatic event. Anxiety is a domain on the Internalizing Subscale as it is focused on the self as opposed to conflict with others. Therefore children with PTSD symptoms would likely have more items endorsed on the Internalizing Subscale. Ruggiero and McLeer (2000) also found that Wolfe, Gentile and Wolfe's (1989) PTSD subscale had difficulty differentiating between a traumatized group and a non-traumatized psychiatric group as a result of overlap of symptoms. These findings suggest that when children are identified by the screening measure as at-risk for PTSD, they should also be carefully assessed for other internalizing problems.

Symptom clusters were shown to be correlated between measures, suggesting that CBCL items were representative of specific symptoms of PTSD. This finding helps to validate the use of the CBCL items to assess diagnostic symptoms instead of relying on associated symptoms (e.g., separation anxiety and feeling nauseous and vomiting), a method used in the development of previous CBCL subscales (Wolfe, Gentile & Wolfe, 1989; Dehon and Scheeringa, 2006). Authors conducting research in this area acknowledged that the lack of an item representing an increased startle response was a limitation in their methodology (Dehon & Scheeringa, 2006). The inclusion of an increased startle response item in the present study was not found to increase sensitivity of the subscale. Results suggested that for this sample, the subscale adequately identified cases without inclusion of this item. This may be because the items related to sleep and being nervous or high-strung may have already accounted for symptoms in the Increased Arousal

clusters, resulting in the increased startle response item not adding anything beyond that required for correct identification.

A proper diagnosis of PTSD requires an interview with the primary caregiver, regardless of findings on the subscale. Specifically, it is essential that PTSD symptoms are related to a specific event that the child experienced, independent from emotional or behavioural problems present for the child prior to the traumatic event. For example, a two-year-old who has difficulty concentrating is not unusual unless his/her parents report that this difficulty began *following* a traumatic event. Therefore, this subscale cannot be used to diagnose PTSD, but only to identify those that may be at risk for the disorder and as such require additional assessment. The subscale in this study was designed to represent the pattern of symptoms found with PTSD, so that participants were required to have symptoms from each of the clusters to meet criteria for PTSD. This is in contrast to previous research in which researchers used a cutoff score to identify those at risk.

The sample used in this study was not solely comprised of children who had already been identified as having experienced a traumatic event, but instead a range of concerns were present for these children, with some having experienced a trauma and others having been referred for behavioural problems or developmental delay. This study is unique in that previous research using a PTSD subscale required that the children in the sample have experienced a trauma. However, the literature on infant trauma has shown that many of the children who receive trauma intervention services were originally referred for behaviour problems secondary to traumatic experiences (Gaensbauer, Chatoor, Drell, Siegel & Zeanah, 1995; Gaensbauer, 2000; Sugar, 1992; Terr, 1988). In the present study, the subscale was used to identify children at risk of

PTSD when a negative event was not originally linked to presenting problems in emotional or behavioural functioning.

A limitation of this study was the small sample size. As a result of the difficulty in identifying cases of PTSD in the community, the sample size was small. It is important to note that research in the area of PTSD in infants and young children has typically yielded relatively small sample sizes, with a large proportion of the research available as either single clinical case studies or a collection of clinical case studies. The largest sample that has been examined in the literature was comprised of sixty-two cases which were actively recruited from a trauma centre over the course of 18 months in a large American city (Dehon & Scheeringa, 2006). The positive findings, however, suggest that testing the effectiveness of the subscale in a larger clinical sample will provide more conclusive results and will increase the validity of generalization to other samples, such as populations not accessing psychological services, with the hope of identifying more children at risk for PTSD.

A second limitation in this study was the inability to include all symptoms possible for a diagnosis. For example, the symptoms of physiological distress at exposure to reminders of the trauma and posttraumatic play require reference to a specific event and the symptoms are meaningless without knowledge of the event. Use of the screening tool does not allow for referencing items to the event, therefore some PTSD symptoms cannot be endorsed using the subscale even if these symptoms are present for the child. This again highlights the importance of using the CBCL subscale as a screening tool and following up with an interview when diagnosing PTSD in this population.

The ability to use the CBCL as a screening tool for PTSD in young children will support professionals in quickly identifying those children who may be at risk for having PTSD.

Increases in the identification of PTSD will likely lead to more effective diagnosis in this population. One area of early childhood PTSD that remains unclear is our understanding of the types of events that constitute trauma for this population. Young children's limited cognitive capacities and inability to process certain frightening events make it difficult to determine whether exposure to certain events is traumatic. With use of the PTSD subscale of the CBCL, many more children can be identified with symptoms of PTSD following exposure to a potentially traumatic event. Future research should be conducted with young children to determine the types of events that are potentially traumatic, as well as the child and family characteristics that put children at risk for developing PTSD following exposure to traumatic events.

Study 2: Infant Life Events, Trauma and PTSD: Perspectives from a Community Sample

Over the last 10 years, criteria have been developed to diagnose Posttraumatic Stress Disorder (PTSD) in infancy and early childhood (Scheeringa, Zeanah, Drell & Larrieu, 1995; Scheeringa, Zeanah, Myers, & Putnam, 2003; DC: 0-3R, Zero to Three, 2005). These criteria largely parallel those for older children and adults but remove the need for verbal self-report and add a greater number of observable features. The alternative criteria have been developed primarily on the basis of case reports of children who were diagnosed with PTSD, often years after experiencing traumatic events in infancy (as early as four months of age). Many questions remain unanswered and it is still not at all clear what constitutes a traumatic event in early childhood or how common it is for infants to be exposed to traumatic events. Further, the individual (i.e., child), family and contextual factors that predict which children will develop PTSD following exposure to traumatic events are not well understood, particularly in infancy and early childhood. The present study was designed to begin to address these questions.

With older children and adults, the nature of traumatic events is well documented although even with older children it has been acknowledged that the definition of what constitutes a traumatic event is perhaps the least clear criterion necessary to the diagnosis of PTSD (Fletcher, 2003). Included in the diagnostic criteria for PTSD in older children and adults is the requirement that “the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others” (DSM-IV-TR, American Psychiatric Association, 2000 , p. 467). Events reported in the literature that have resulted in the development of PTSD in older children and adults include: natural disasters, kidnapping, war, torture, migration and exile, physical and sexual abuse, life-threatening illnesses, motor-vehicle accidents, fires, dog bites, school shootings, and

terrorist attacks. There is good evidence that the development of PTSD symptoms in school-age children following a traumatic event is related to dimensions of events such as proximity to the event, chronic exposure, as well as the uncontrollable or unexpected nature of events (Fletcher, 2003).

Case studies of traumatic events in infancy and early childhood have been shown to have negative, long-lasting effects (Terr, 1988; Sugar, 1992; Scheeringa & Zeanah, 1995; Scheeringa, Zeanah, Drell & Larrieu, 1995; Gaensbauer, 1995; Gaensbauer, Chatoor, Drell, Siegel & Zeanah, 1995; Gaensbauer, 2000; Scheeringa, Zeanah, Myers, & Putnam, 2004). This literature has identified a number of events that have been shown to be related to the development of PTSD for infants (e.g., witnessing threat or harm to a caregiver, death of a parent, motor vehicle accidents, abuse, fire, natural disasters, animal attacks, accidents, falls, confinement). While informative, these case studies leave open the possibility that there are other events that may be traumatic for infants and young children, or, that there may be events that are traumatic for older children and adults that are not traumatic for younger children. Infants' cognitive capacities are less well developed than those of older children and it cannot be assumed that infants understand the meaning of an event similarly to an adult or older child. That is, an experience that is terrifying for an adult may not be perceived as dangerous to an infant. Alternatively, an infant's inability to verbalize their experiences may make it more difficult for them to understand a situation in context, resulting in a traumatic reaction for an event that would not be traumatic for an adult or older child. Solter (2007) reported on a case study of a five month old who, following hospitalization for surgery to his skull, became terrified and inconsolable when placed in the supine position for diaper changes and sleep. Prior to surgery he enjoyed hours on his back engaged with his parents during play, in addition to functional care activities. His inability to

process his traumatic experience in the hospital while lying in the supine position (the child experienced much fear and pain related to many injections, swelling of his face resulting in temporary blindness, and catheterization), caused him to generalize these feelings of fear and pain when lying in this position at home, following discharge from the hospital. This case demonstrates the differences in perception that can occur for young children and adults to negative events.

Scheeringa and Zeanah (1995) have shown that infants (birth to 3 years) who witness threat or harm to a primary caregiver are more likely to develop more frequent and severe PTSD symptoms relative to those who experience any other trauma, including direct life threatening events. This is further testament to the likelihood that trauma must be considered differently in infancy. In fact, Scheeringa and Zeanah (2001) have proposed *relational trauma* as a major traumatic process in young children. These examples demonstrate the importance of understanding which events are potentially traumatic for infants, and suggest the need to be cautious when making assumptions about the nature of infants' subjective experience.

The majority of the infant trauma literature is comprised of case studies that report on older children or adults who went untreated for a trauma experienced in infancy (Bowlby, 1973; Gaensbauer et al., 1995; Gaensbauer, 2000; Sugar, 1992; Terr, 1988). Indeed, these individuals began treatment much later for serious behaviour problems or relationship issues that developed as a result of the unresolved trauma. To date, it is not clear why infants and young children who experience traumatic events are not receiving early diagnosis and treatment although several explanations may be tenable.

One hypothesis is that health professionals are less well trained in the differential diagnosis of early behaviour problems given that much of this knowledge is relatively recent. Alternatively,

parents and professionals may be assuming that what constitutes a trauma for an infant is the same as it is for older children and adults. Another problematic assumption on the part of parents and professionals may be that young children's limited verbal abilities and/or less well developed cognitive capacities mean that early childhood trauma will not have any major lasting consequences. Finally, given rapid developmental changes in the first few years of life, any sudden behaviour changes may be interpreted as normal developmental shifts rather than being attributed to the experience of trauma.

To explore the question of why infants who demonstrate symptoms of PTSD are not generally identified or treated for PTSD in infancy, a community sample of young children was recruited and given a questionnaire asking parents to identify the nature of their infants' life experiences from birth. Rather than asking parents whether their children had actually experienced any potentially traumatic events, they were simply asked whether their child had experienced any of the events listed. Events selected for inclusion were derived from the infant PTSD literature, early autobiographical memory studies, reports of the causes of child injuries at hospital emergency rooms, and from parents' and caregivers' reports of a wide range of positive, neutral and negative events commonly experienced in infancy (birth to age three years). In this way, it was our hope to determine the frequency of a range of infant life events in a community sample in as unbiased a way as possible.

For a diagnosis of PTSD, the DSM-IV-TR (APA, 2002) requires that the individual experience a feeling of "intense fear, helplessness or horror" during or following a traumatic event (criterion A2). These reactions suggest that the individual is attending to the event and that they recognize the experience as dangerous or frightening. These subjective intense emotions are particularly difficult to record in infants. Currently, criterion A2 is not required for a diagnosis of

PTSD in infants because of its reliance on self-report (Scheeringa et al., 1995, 2003; DC: 0-3R, 2005). However, research has shown that older children and adults who experience an intense emotional reaction during or immediately following a traumatic experience are much more likely to develop PTSD than those who do not react intensely (Fletcher, 2003; Brunet, Weiss, Metzler, Best, Neylan, Rogers, et al., 2001). For this reason, it was expected that a strong negative reaction, as reported by parents, during or immediately following a negative event would provide important information about which events are more likely to be traumatic for young children.

There is good evidence in the older child and adult trauma literature that a diagnosis of PTSD is more likely to be associated with exposure to multiple traumatic events (Green, 1985; McFall, Smith, Roszell, Tarver, & Malas, 1990; Terr, 1991). To test whether this holds true for young children, the cumulative effect of exposure to multiple potentially traumatic events in infancy was explored. As well, research with older children has indicated that there are individual characteristics of children and their families that increase the risk of developing PTSD symptoms. For example, increased parental PTSD, anxiety, depression, and overall psychopathology are associated with symptoms of PTSD in older children (see Fletcher, 2003 and Scheeringa & Zeanah, 2001 for reviews). These findings highlight the importance of determining the impact of parental psychopathology on infants' symptoms of PTSD. Other common risk factors for PTSD in older children are low annual income, low maternal education, child's difficult temperament, and dysfunctional parenting style (Fletcher, 2003; Crittenden, 1985). Whether these same risk factors play a role in PTSD symptom development in early childhood is not clear.

In summary, the objectives of Study 2 were to: (a) determine the frequency of events that have been shown to be traumatic for infants in the case study literature in a community sample,

(b) determine whether parent's reports of the strength of infant's negative emotional reactions during or immediately following an event are related to the frequency of PTSD symptoms identified, (c) document the specific events that are related to symptoms of PTSD, and (d) determine whether individual child and family characteristics and/or their interactions could account for PTSD symptom expression above and beyond knowledge of the number of traumatic events experienced in early childhood.

Method

Participants

A community sample of families with young children was recruited from all those attending public health clinics for their 18-month immunization throughout a medium-sized Canadian city over a 6-month period. These families were part of a two-phase longitudinal study investigating predictors of sleep patterns, health status and early behavioural and relational problems in infants and young children. Children in Phase I had a mean age of 18.1 months. At Phase I, a total of 817 participants were invited to complete a brief screening measure during their visit to the immunization clinic. Of the 817 possible participants, 796 completed the screening tool (97.4% response rate). Seventy-five of these 796 participants were excluded due to incomplete data or falling outside the target age range. Six-hundred and twenty of those participants indicated that they would be willing to participate in Phase I. Phase I surveys were mailed to the 620 families and of those, 371 were returned (59.8% response rate). For six of the 371 returned surveys, parents answered the questions for the wrong child and were therefore excluded.

When the children of these families were between the ages of 3 and 4 years old (mean = 3.3 years), Phase II was completed. Of the 365 questionnaires mailed in Phase II, 226 reached the families (i.e., 139 families had moved and could not be traced). One-hundred and seventy-two

completed surveys were received in Phase II. This represents 76% of those who received the Phase II survey. Only those children who had complete data for both Phase I and Phase II were included in the present study. Four families who returned their Phase II questionnaire did not have complete data at Phase I, therefore the present study is comprised of 168 participants.

The average age of the sample at Phase II was 39 months (SD = 3 months) and was comprised of 46.8% females. The ethnic background of the sample was: 83.2% Caucasian, 8.1% Aboriginal, 3.5% Asian, and just under 1% Black. Only 7% of the parents had never been married, 90% were married and the remaining 3% were living with someone who functioned in the role of mother/father to the child. Education level for the primary caregiver was found to have a bimodal distribution, in that 25% of the sample completed community college and 25% completed university. Family income ranged from less than \$9,999 CAD to more than \$95,000 annually, with a median annual income of \$45,000 to \$54,999 accounting for the largest proportion of participants (22% of the sample). This was a middle class sample.

Measures

Parents were asked to complete a number of questionnaires related to their infants and themselves at Phase I and Phase II of the study. At Phase I, information related to demographics, infant temperament, parenting style and maternal psychological distress was collected. During Phase II, the Child Behavior Checklist (CBCL, Achenbach & Rescorla, 2000) and the Infant Life Events Scale, as well as other measures that were part of a larger battery and not the focus of the present investigation were included.

A demographics questionnaire was used to collect information related to the child's age, gender, ethnic background, as well as family income and maternal education (Appendix B).

Infant temperament. The Infant Characteristics Questionnaire (ICQ; Bates, Freeland, & Lounsbury, 1979; Appendix E) was used to measure parental perception of infant temperament. This measure is comprised of 24 items, each of which is rated on a 7-point scale, indicating the level of perceived difficulty in dealing with the described behavior. Items were summed together, with higher scores indicating that the child is perceived to have a more difficult temperament. This measure has been shown to have acceptable validity and reliability (Bates et al., 1979; Frankel & Bates, 1990). Specifically, the ICQ was found to have adequate internal consistency (.79), test-retest reliability (.70) and convergent validity between parents (.61).

Parenting style. The Parenting Scale (PS; Arnold, O'Leary, Wolff, & Acker, 1993; Appendix F) was developed as a screening measure to help professionals identify parents who engaged in discipline styles that could put their preschool children at risk for later behaviour problems (i.e., non-compliance and aggression). The PS is a 30-item measure that uses a 7-point response scale for a number of problematic areas of discipline, which are matched with an effective counterpart (e.g., "When my child misbehaves... I raise my voice and yell" was matched with "... I speak to my child calmly"). The PS Total Score is an average of all 30 items on the scale, and was the score that was used in the main analyses for each child. Higher scores indicated greater use of dysfunctional discipline practices by parents. Arnold and colleagues (1993) have reported good internal consistency (.84), test-retest reliability (.84) and construct validity (.22 to .53).

Maternal psychological distress. Symptoms of psychological distress were measured using the Brief Symptom Inventory (BSI; Derogatis, 1993). This measure is described in more detail in Study 1.

Infant experience. The Infant Life Events Scale (ILES; Appendix G) was developed for this study to gather information on events that infants experience. The questionnaire consists of 52 events/experiences that an infant may have had in their first 3 years of life. The events range from generally positive, to more neutral, and finally to potentially stressful and traumatic events (however the order of events listed on the scale was random). Events were included based on consultation with a number of relevant sources. A significant number of events were included based on consultation with developmental psychologists and parents of infants. The more negative events were included based on those that have been described in the existing infant trauma case study literature (Terr, 1988; Sugar, 1992; Scheeringa, Zeanah, Drell & Larrieu, 1995; Gaensbauer, 1995; Gaensbauer, Chatoor, Drell, Siegel & Zeanah, 1995; Gaensbauer, 2000; Scheeringa, Zeanah, Myers, & Putnam, 2004). A question regarding whether children had experienced abuse (physical, sexual or emotional) was not included for ethical reasons. Specifically, to include a question about abuse, I would have been obligated to explicitly inform research participants that I would be obligated by law to inform authorities if I had any knowledge about a child being at risk of harm. This would likely make people more reticent to acknowledge abuse. Also, confidentiality would be broken if I had to act, complicating research confidentiality. However, the development of the ILES was informed by a comprehensive chart review study conducted in a local hospital involving all cases of infants (0-3 years) who were admitted between the years of 1995 to 2000, and either received a diagnosis of suspected child abuse or who had injuries consistent with abuse (McKim & Cherland, 2003). For our purposes, the events that were reported by parents in this chart review study as the “cause” of their child’s injuries were included in the scale. Finally, verbatim transcripts of 31 adults participating in a study of early autobiographical memory were reviewed (Hanson, 2003). These were events that

occurred in early childhood and were particularly salient to those who experienced them. Events reported in the autobiographical memory study that were not already included in the Infant Life Events Scale were added. Parents also had the option of including any events that were not already on the scale. Few parents made additions, and those who did described events that were specific instances of existing event items which they had already endorsed (e.g., “fell and broke femur” which was already captured by “had a major fall”).

For each event on the ILES, parents were asked to indicate whether their child had experienced this event or not. If they had, parents noted age at time of event and what their child’s reaction was at the time of the event (“Unsure/Don’t know/NA”, “No reaction”, “Little reaction”, “Medium reaction”, “Strong reaction”, and “Very strong reaction”). Parents also indicated whether they thought the event was positive or negative for their child, by circling one of five points along a scale ranging from “Positive” to “Negative”. For example, some parents reported that attending a parade was a positive event, whereas others reported that it was a negative experience for their child.

Negative events found on the Infant Life Events Scale (ILES) were divided into two groups. The first group consisted of events that were demonstrated in the case study literature to be associated with PTSD in infants. These events will be referred to as “known traumatic events” and are listed in Table 8. The second group was composed of events that at least 75% of parents in this sample indicated were both negative and caused their child to have a strong reaction at the time of the event. These events will be referred to as “parent identified negative events” and are listed in Table 9. Total Scores for “known traumatic events” and “parent identified negative events” were determined by summing the number of events each child had experienced from each list of events.

Table 8

Frequency of potentially traumatic events (identified in the infant trauma literature as being associated with the development of PTSD) in a community sample

Event	<i>n</i>	%
Death of parent	0	0
House fire	1	0.6
Involved in an accident with machinery	1	0.6
Witnessed an accident to a close friend/family	2	1.2
Witnessed harm/violence to you or another important person	3	1.8
Witnessed harm/violence/hurt to stranger	5	3.0
Car or boat accident	12	7.2
Saw close family member get hurt or fall	14	8.4
Was bitten by a dog or attacked by an animal	16	9.6
Your child was locked in an enclosed space	24	14.4
Death/major illness of important person	31	18.6
Experiencing a major natural event such as a storm or tornado	48	28.7
Experienced a painful medical procedure	55	32.9
Had a major fall	55	32.9

Table 9

Frequency of events that parents reported were negative and caused a strong reaction in a community sample

Event	<i>n</i>	%
Involved in an accident with machinery*	1	0.6
Witnessed an accident to a close friend/family*	2	1.9
Witnessed harm/violence to you or another important person*	3	1.8
Experienced a near drowning	6	3.6
Was bitten by a dog or attacked by an animal*	16	9.6
Your child was locked in an enclosed space*	24	14.3
Received a burn	28	16.6
Lost favourite toy or object	45	26.9
Experienced a painful medical procedure*	55	32.9
Had a major fall*	55	32.9
Thought they were lost or left behind	59	35.3
Was frightened by a very loud noise	68	41.0
Pushed, hit or bit by another child	142	85.0
Was disciplined for bad behaviour	151	90.4

* denotes that these events have also been shown to be traumatic in the infant trauma literature

Child Problems. The Child Behaviour Checklist 1½ to 5 (CBCL, Achenbach & Rescorla, 2000) was also included in the survey. This is a 100 item parent-report questionnaire that has been standardized to measure children's behavioural and emotional problems. A PTSD subscale of the CBCL has been shown to be an effective screen for PTSD symptoms in traumatized preschool children (see Study 1) and the items used to represent symptoms of PTSD in this sample have been shown to be associated with symptoms of PTSD using the Posttraumatic Stress Disorder Semi-Structured Interview and Observational Record for Infants and Young Children (Infant PTSD Interview; Scheeringa & Zeanah, 1995). The PTSD subscale of the CBCL was used to record symptoms of PTSD in this community sample. Symptoms of PTSD were considered present if parents indicated that an item on the CBCL was "somewhat or sometimes true" and "very true or often true." Responses on these 13 items were summed to give a Total PTSD Symptom Score. Internal consistency was found to be adequate with $\alpha = .75$ for this study. Table 4 lists these symptoms and the corresponding CBCL items.

Results

Data Cleaning

Variables were examined for assumptions of normality and transformations were performed as outlined in Tabachnick and Fidell (2001). The number of "known traumatic events" was positively skewed and therefore a square root transformation was performed resulting in a more normal distribution. Similarly, square root transformations were performed on the Parenting Scale to reduce negative kurtosis and the Brief Symptom Inventory to reduce both positive skewness and kurtosis. A log transformation was performed on the PTSD Total Score to reduce positive skewness and kurtosis. Analyses were run with both transformed data and untransformed data, and no significant differences were found between the analyses. Although

analyses were conducted with the transformed data, presentation of data in text and tables are based on raw data for ease of interpretation. Although results using raw versus transformed data were slightly different in some cases, patterns of results did not differ and significance was not affected.

Frequency of “Known Traumatic Events”

Table 8 presents the frequency of “known traumatic events” for this community sample. The most common events reported were “had a major fall” ($n=55$, 32.9%), “experienced a painful medical procedure” ($n=55$, 32.9%) and “experienced a natural event such as a storm or tornado” ($n=48$, 28.7%). The least common events from this category included experiencing the ‘death of a parent’ ($n=0$), experiencing a ‘house fire’ ($n=1$, <1%) and being “involved in an accident with machinery” ($n=1$, <1%). A significant positive relationship was found between the number of “known traumatic events” experienced and the total number of symptoms of PTSD, as reported using the PTSD subscale of the CBCL, $r(166) = .19$, $p = .019$.

Frequency of “Parent Identified Negative Events”

In order to determine which events caused a strong emotional reaction at the time of the event, the “parent identified negative events” were examined. Table 9 lists those events that met criteria for being both negative and causing a strong reaction. The most common events reported were “was disciplined for bad behaviour” ($n=151$, 90.4%), “pushed, hit or bit by another child” ($n=142$, 85%), and “was frightened by a very loud noise” ($n=68$, 41%). The least common events from this category included “involved in an accident with machinery” ($n=1$, <1%), “witnessed an accident to a close friend/family” ($n=2$, 1.9%) and “witnessed harm/violence to an important person” ($n=3$, 1.8%). There was no significant relationship found between the number of these

“parent identified negative events” experienced and the number of PTSD symptoms reported, $r(166) = .121, p = .118$.

Specific Events Associated with Symptoms of PTSD

In order to determine which specific events from both the “known traumatic events” (Table 8) and the “parent identified negative events” (Table 9) were associated with more symptoms of PTSD, twenty-one correlations were conducted, between each negative event and the PTSD Symptom Total Score (see Table 10 for a list of correlations).

Results of the correlations suggest that “witnessing a close family member get hurt or fall”, $r(164) = .186, p = .016$, and “experiencing a major natural event such as a storm or tornado”, $r(164) = .226, p = .003$, were disproportionately more likely to be associated with greater symptoms of PTSD. In contrast, one event was identified as being negatively associated with symptoms of PTSD. This event was “pushed, hit or bit by another child”, $r(164) = -.153, p = .049$.

Family Characteristics Associated with Symptoms of PTSD

A hierarchical multiple regression was conducted in order to examine whether child and family characteristics would be predictive of PTSD symptoms after controlling for the number of “known traumatic events” reported (Table 11).

Using number of PTSD symptoms as the criterion variable, the number of “known traumatic events” was entered in Step 1, followed by family and child characteristics (child’s gender, annual income, mother’s education level, child temperament, parenting scale, maternal psychological distress) on Step 2. Interactions between family/child characteristics and the number of “known traumatic events” were entered on Step 3 to examine whether family/child

Table 10

Correlations between negative events and PTSD symptoms

Event	<i>n</i>	<i>r</i> (df=164)	Sig.
Car or boat accident	12	.074	.341
Death of parent	0	--	--
Death/major illness of important person	31	-.059	.450
Experienced a near drowning	6	.017	.826
Experienced a painful medical procedure	55	-.011	.890
Experiencing a major natural event such as a storm or tornado	48	.226	.003
Had a major fall	55	.114	.143
House fire	1	-.023	.773
Involved in an accident with machinery	1	-.028	.718
Lost favourite toy or object	45	.127	.103
Pushed, hit or bit by another child	142	-.153	.049
Received a burn	28	.107	.169
Saw close family member get hurt or fall	14	.186	.016
Thought they were lost or left behind	59	.027	.734
Was bitten by a dog or attacked by an animal	16	.041	.601
Was disciplined for bad behaviour	151	-.012	.878
Was frightened by a very loud noise	68	.115	.138
Witnessed an accident to a close friend/family	2	.004	.954
Witnessed harm/violence to you or another important person	3	.088	.257
Witnessed harm/violence/hurt to stranger	5	.144	.065
Your child was locked in an enclosed space	24	.075	.337

Table 11

Hierarchical regression of number of “known traumatic events”, child and family characteristics, and interactions on number of PTSD symptoms

Variables	B	β	<i>p</i>	R ² _{Total}	R ² _{Change}
Block 1:				.033	.033
Traumatic events	.157	.181	.019		
Block 2:				.134	.102
Traumatic events	.133	.154	.042		
Child’s Gender	-.024	-.021	.779		
Annual Income	-.028	-.131	.116		
Educational Level	-.016	-.050	.548		
Temperament	.009	.176	.026		
Parenting	.138	.040	.602		
Maternal Psychological distress	.305	.149	.061		
Block 3:				.175	.040
Traumatic events	.194	.224	.229		
Child’s Gender	-.006	-.005	.947		
Annual Income	-.021	-.097	.255		
Educational Level	-.020	-.060	.470		
Temperament	.009	.167	.039		
Parenting	.097	.028	.717		
Maternal psychological distress	.339	.166	.040		
Event x Gender	.321	.184	.021		
Event x Income	.010	.029	.722		
Event x Education	-.042	-.085	.320		
Event x Temperament	-.002	-.022	.794		
Event x Parenting	.173	.075	.688		
Event x Maternal psychological distress	-.365	-.115	.162		

characteristics might moderate the relationship between number of traumatic events and PTSD symptoms.

The number of traumatic events was observed to be a significant predictor of PTSD symptoms on Step 1, $F(1, 165)=5.61, p<.019$, accounting for 3.3% of the variance. The inclusion of family and child characteristics on Step 2 accounted for an additional 10.2% of the variability in PTSD symptoms. An inspection of the standardized beta weights for Step 2 revealed that the number of traumatic events and child temperament were uniquely predictive of PTSD symptoms when all other variables were controlled. Although only marginally significant, maternal psychological distress was also predictive of PTSD symptoms. Specifically, more extreme PTSD symptomatology was predicted from a greater number of traumatic events, more difficult child temperament and greater maternal psychological distress.

The addition of interactions involving the number of traumatic events and child/family characteristics on Step 3 did not yield a significant increment in variance accounted for, F -change = 1.25, $p=.286$, suggesting that none of the child or family characteristics moderated the link between number of traumatic events and PTSD symptoms.

Discussion

The ability to identify infants exposed to potentially traumatic events is important for infants, their families and clinicians working with young children. Understanding the types of events that are traumatic for young children will help identify those who may be at risk for developing PTSD. The purpose of Study 2 was to gain a better understanding of what constitutes a traumatic event in early childhood. Specifically, the study identified the frequency of potentially traumatic events in a community sample, explored parental reports of children's reactions at the time of an event to determine if this reaction was predictive of PTSD symptoms, and identified the child

and family characteristics that accounted for PTSD symptoms above and beyond the experience of traumatic events.

Study 2 demonstrates that a number of events previously documented in the infant trauma case study literature occur relatively frequently in the general population. Although not a particularly strong relationship, the cumulative effect of experiencing multiple “known traumatic events” was associated with more PTSD symptoms in this community sample. In contrast, experiencing more “parent identified negative events” was not associated with symptoms of PTSD. These findings may suggest that parent reports of young children’s experiences of negative events are not necessarily a good indication of trauma. Past research with older children has found that parents are not the most reliable reporters of traumatic experiences for their children (McNally, 1993). The findings from this study suggest that this may also be true for young children. In order to ensure that young children are more effectively screened for PTSD, professionals should be aware of the events that have been shown to be associated with PTSD in young children so that early intervention can be provided.

Interestingly, a number of the “known traumatic events” were not reported by parents as being negative and causing a strong reaction in their children (e.g., “experiencing a major natural event such as a storm or tornado”, “saw a close family member get hurt or fall” and “experiencing a car or boat accident”). And yet, in the present study events associated with more symptoms of PTSD included “experiencing a major natural event such as a storm or tornado” and “saw a close family member get hurt or fall”. Older children and adults who react strongly at the time of an event are at greater risk for PTSD, however, this may not be the case for young children. Perhaps infants react differently to traumatic events or these behaviours are not easily detected by parents. It may also be the case that young children demonstrate symptoms of PTSD

which parents attribute to normal development, such as the sudden onset of the “terrible twos”. Prospective research with clinical samples recruited immediately following trauma should look more systematically at the responses of infants to traumatic experiences and parents’ responses to, and interpretations of, their infants’ behaviour immediately following traumatic events. In addition, these findings suggest that young children referred for emotional and/or behavioural difficulties should be carefully assessed for traumatic experiences, as this may be the cause of the child’s difficulties.

Events that were associated with *fewer* symptoms of PTSD included being “pushed, hit or bit by another child”. Although this was described as a negative event by parents, it is likely not a “traumatic” event for young children (i.e., is not likely to result in death or serious injury). Instead, experiencing this event may represent the young child’s opportunity to have access to important social interactions through play, as well as opportunities to learn to cope with stress, thereby resulting in this event perhaps being associated with fewer symptoms of PTSD.

Results found that a greater number of traumatic events predicted the number of PTSD symptoms in this sample. Research has shown that cumulative stress resulting from multiple traumas is a risk factor for the development of PTSD in older children and adults (Yehuda, Spertus & Golier, 2001; Koenen, Moffitt, Poulton, Martin, & Caspi, 2007). The findings from this study are therefore consistent with other PTSD literature.

Potentially traumatic events were found to be relatively pervasive in this community sample, however not all children react to stressful events with symptoms of PTSD. This study demonstrated that family and child characteristics are associated with the development of PTSD, above and beyond the effects accounted for by experiencing “known traumatic events”. Specifically, after controlling for the experience of “known traumatic events”, more extreme

PTSD symptomatology continued to be predicted from more difficult child temperament and greater maternal psychological distress although this later effect was only a trend.

The fact that children with more difficult temperaments were observed to have more PTSD symptoms fits well with research conducted recently by Koenen, Moffitt, Poulton, Martin, and Caspi (2007) in which children with more difficult temperaments were at significantly higher risk of developing PTSD as adults. The authors hypothesized that children with more difficult temperaments were less skilled at regulating their emotions and therefore were not able to cope with the stress of the experience. Thus, the experience of traumatic events may well take a greater toll on infants and preschoolers who struggle with emotion regulation. An alternative hypothesis could be that parents may attribute the child's emotional and/or behavioural problems to the child being "difficult" and not to the traumatic event. If this is the case, parents may have a difficult time recognizing when their children are struggling with symptoms of PTSD, and would be less likely to seek treatment for a trauma. This would suggest that children with more difficult temperaments may require careful screening for traumatic events, as parents may not recognize the negative impact of a traumatic event on their young child.

Maternal psychological distress was marginally predictive of PTSD symptoms. These findings, in combination with the findings that both negative events associated with PTSD symptoms likely involved important family members (i.e., "experiencing a major natural event such as a storm or tornado" and "saw a close family member get hurt or fall"), suggest the importance of caregivers' own physical and emotional health in the development of PTSD. Our findings replicate those of Scheeringa and Zeanah (2001) who found that events in which a caregiver's safety was at risk were significantly predictive of symptoms of PTSD and that maternal functioning had a significant impact on symptoms of PTSD in young children.

Specifically, distress experienced by mothers seems to go hand in hand with elevated PTSD symptoms. Given the correlational nature of the design for Study 2, it may be that a greater number of PTSD symptoms in infants and preschoolers elevates the distress experienced by mothers as they attempt to help their children function.

In order to effectively utilize a community sample of young children, a survey method was employed. A limitation to this study, which has also arguably been its strength, is the method of documenting PTSD symptoms for participants. At present, the gold standard for diagnosis of PTSD is made following a structured interview with caregivers (Scheeringa, Zeanah, Drell & Larrieu, 1995). In this study, the PTSD subscale of the CBCL (Study 1) was used to objectively gather a significant amount of information in a more efficient way with a large community sample.

Future research should explore the reasons why many parents and professionals have difficulty recognizing events that may put a young child at risk for PTSD. In order to have a better overall understanding of infant trauma, studies examining the role of more child and family characteristics, genetic vulnerability, physiology (i.e., stress hormone functioning) and the role of caregiver psychological distress and the attachment relationship in predicting PTSD symptoms in infants are also needed.

Study 3: Trauma in Early Childhood: The Emotional, Physiological and Relational Effects

Although detrimental effects of traumatic events in infancy were traditionally believed to have no long-lasting impact, it is clear that this is not the case (Gaensbauer, 2002; Scheeringa & Zeanah, 1995; Sugar, 1992; Terr, 1991). Infants and young children develop posttraumatic stress disorder (PTSD) similar to older children and adults, and require intervention to buffer the negative effects of traumatic experiences (Scheeringa & Zeanah, 2005). Emotional and behavioural symptoms are not the only effects of PTSD for infants. Stress-response systems necessary for coping are thought to be permanently affected as a result of prolonged stress (Schoore, 2001). In addition, research has shown that the caregiver-infant attachment relationship may be an important moderator for infants' ability to cope with common stressors (Nachmias, Gunnar, Mangelsdorf, Parritz, & Buss, 1996). The present study takes a multidimensional approach to understanding the relationship between PTSD in infants and young children and the functioning of the stress response-system. Of additional interest is the question of whether quality of attachment and caregiver psychological distress moderate the relationship between a potentially traumatic event and PTSD in early childhood. In order to answer these important questions, two phases of research have been conducted. Phase I was a pilot study involving a community sample and Phase II examined the multidimensional effects of PTSD in a clinical sample.

There remains a paucity of research on the rate of PTSD found in early childhood. Case study reports suggest that PTSD in young children has been significantly under-diagnosed, with the majority of cases having been identified by clinicians following referral of children for behaviour problems later in childhood (Bowlby, 1973; Gaensbauer et al., 1995; Gaensbauer, 2000; Sugar, 1992; Terr, 1988). Only three studies have conducted systematic investigations of

traumatized infants, providing rates for children with known exposure to traumatic events. Of course, there are likely many more children who have not been identified and are not receiving services. Scheeringa and colleagues' research in infant trauma has found varying rates of PTSD ranging from 26% to 69% (Scheeringa et al., 1995, 2001, 2003). The present aimed to determine the rate of PTSD in a sample seeking treatment at an infant and preschool clinic, in which some children were referred following a trauma and others were referred for behavioural or developmental concerns. In addition to being interested in the emotional and behavioural effects of PTSD on young children, I was also interested in understanding how physiological systems may become dysregulated following exposure to a potentially traumatic event.

The human stress-response system is a physiological coping response that involves the hypothalamic-pituitary-adrenal (HPA) axis. Cortisol is a stress hormone, originating within the HPA axis, which is released in response to stress. Although stress-reactivity is important for survival, prolonged elevations in the stress-response system can be detrimental to individuals, causing dysregulation of the system (i.e., increased or suppressed levels of cortisol release). Dysregulation can result in abnormal increases or decreases of important hormones, which may sensitize or suppress the stress-response system to stressful experiences (Shea, Walsh, MacMillan & Steiner, 2004).

Emerging evidence suggests that children and adults with PTSD are at risk for chronic changes to physiological stress-response systems. In adults, researchers have discovered that individuals with PTSD have lower resting cortisol rates than adults without PTSD (Neylan et al., 2005; Yehuda, 2002; Rasmusson et al., 2003), reflecting a suppression of cortisol release. Research studying cortisol levels in children and adolescents has generated mixed results. DeBellis and colleagues (1999) found that children aged 8 to 13 years with PTSD ($n = 18$) had

higher levels of cortisol circulating in their bodies than overanxious children ($n = 10$) and healthy matched controls ($n = 24$). Carrion and colleagues (2002), who studied cortisol in 51 children (aged 7 to 14 years) following exposure to a traumatic event, also found that children with a history of trauma had higher cortisol levels than a matched control group. In contrast, King, Mandansky, King, Fletcher, and Brewer (2001) studied girls (aged 5 to 7 years) who were sexually abused ($n = 10$), and found that they had lower levels of cortisol than a control group ($n = 10$). Shea, Walsh, MacMillan and Steiner (2004) conducted a review of the childhood PTSD literature and determined that there remains conflicting evidence of cortisol release for those with PTSD, acknowledging that many factors likely play a role at each stage of development (e.g., hormonal effects in pubertal females), making results difficult to compare. An important factor that may contribute to varying rates of cortisol release in young children is the quality of attachment that a young child has with his/her primary caregiver, in that a responsive caregiver provides emotional and physiological stability during times of stress (Scheeringa et al., 1995).

Schore (2001) suggests that psychobiological changes as a result of trauma during the critical growth period of the limbic system may result in “characterological styles of coping that act as traits for regulating stress” (Schore, 2001, p.212). Attachment relationships have long been implicated in the mediation of stressful events experienced by infants (Bowlby, 1988). A secure attachment can help the infant to be more resilient to negative events, while an insecure attachment can put an infant at risk for more developmental problems (Rutter, 1995; Sroufe, 2000). Research suggests that infants who experience responsive caregiving and have secure attachments with primary caregivers show more resilience to stress and adversity, and are better able to recover following stress. In contrast, infants with insecure and disorganized attachments are at greater risk for psychological distress in later childhood and adulthood. This suggests that

resiliency is a process occurring during development rather than an individual trait (Weinfield, Sroufe, Egeland, & Carlson, 1999).

Some very young animals and human infants have shown dysfunctional reactions to stress, whereas other animals and humans seem to be able to modulate their stress-responses through maternal responsivity (Glaser, 2000). Gunnar, Brodersen, Nachmias, Buss, and Rigatuso (1996) found that insecurity of mother-infant attachment predicted elevated cortisol to physical examinations followed by inoculations in 15 month olds, suggesting that secure attachment relationships regulate stress-response system functioning to stressful experiences in young children. Watamura, Donzella, Alwin and Gunnar (2003) found that infants in daycare showed higher cortisol release throughout the day, compared to these same children's cortisol level at home. The authors speculated that HPA activation may be context-specific during infancy and reflect the importance of caregivers in the regulation of stress. A significant difference between infant trauma and trauma that occurs with older children and adults is the infant's complete dependence for his/her safety and survival on a primary caregiver.

Scheeringa and Zeanah (2001) reviewed 17 studies that reported on parent and child adjustment following a traumatic event. Sixteen of these studies found a significant positive association between parental functioning and child functioning following a trauma. Children whose parents had poorer functioning had higher rates of PTSD, an increased number of symptoms of PTSD, higher internalizing and externalizing scores on the Child Behaviour Checklist (Achenbach, 2000), and increased depression scores. A number of parenting factors were also found to be associated with worse child outcomes, such as increased parental anxiety since the event, increased general psychiatric problems in either parent, increased irritability and withdrawal within family, decreased supportiveness of the child, and denial or suppression of the

children's symptoms. When studies included young children, maternal PTSD symptoms and general psychopathology were associated with more PTSD symptoms in 3-4 year olds, but not in 5-year-olds, providing evidence that relational effects may be more important for younger children.

Although the role that the quality of attachment relationships play in moderating infants' stress responses has not been shown specifically with trauma, it was postulated that attachment security would moderate emotional reactivity (i.e., symptoms of PTSD) following a traumatic event. Specifically, I was interested in examining how the experience of trauma was related to symptoms of PTSD with varying levels of quality of attachment.

The present study was conducted in two phases. Phase I involved recruiting a sample of young children in the community (i.e., not identified as already receiving psychological services). Phase II involved recruiting a sample of young children from an infant and preschool clinic (i.e., children identified as having trauma-related ($n = 10$), developmental ($n = 1$), emotional or behavioural ($n = 10$) problems that required psychological services). Phase I assessed PTSD symptoms (related to a negative life event identified using the Infant Life Events Scale), quality of the attachment relationship with the primary caregiver, and basal cortisol levels. Phase II was similarly designed to assess PTSD symptoms, quality of the attachment relationship, maternal psychological distress and basal cortisol levels. It should be noted here that although salivary cortisol samples were collected in Phase II, these samples were destroyed in error by a lab technician prior to being analyzed. Unfortunately, it is not possible to present cortisol data as part of Phase II.

Phase I: Multidimensional Approach to PTSD in a Community Sample

The objectives of Phase I were to: (a) determine whether symptoms of PTSD related to potentially traumatic events were found in a community sample, (b) determine whether quality of attachment was related to symptoms of PTSD, and (c) determine whether basal salivary cortisol was related to symptoms of PTSD in this sample.

Method

Participants

Twelve children (mean age of 57 months, ranging between four years and five years of age) participated in this study. Participants represented a subset of children recruited from a project investigating the effects of negative life events (i.e., Study 2). Participants were chosen based on the likelihood of having experienced negative events and stress. Children with the highest CBCL Total Scores in the project (described in Study 2) were identified and approached to participate in this study. None of these children were receiving mental health services at the time of the study. Families attended a single session at the Infant and Preschool Clinic, where they were administered the Infant PTSD Interview and asked to complete the Attachment Q-Sort. They were provided with saliva assays to take home in order to collect a saliva sample from their child on a *normal* day. Demographics were collected from the family, specifically the child's age, gender, ethnic background, as well as family income and the primary caregiver's education (Appendix B). Table 12 provides a description of both samples from Phase I and Phase II of Study 3.

The median education level for the primary caregiver was “completed community college”, accounting for 41.7% of the sample. Median annual income was found to be in a

Table 12

Demographic Variables for Study 3 Samples

Variable		Phase I Sample (N = 12)	Phase II Sample (N = 21)
Mean age in months (<i>SD</i>)		57.25 (1.58)	39.1 (10.99)
Gender			
Female (%)		58.3	23.8
Male (%)		41.7	76.2
Ethnicity*			
First Nations (%)		0	14.3
Caucasian (%)		91.7	57.1
Métis (%)		0	23.8
Other (%)		8.3	0
Primary Caregiver's Years of Education		14	13
Annual Family Income		25,000 – 34,999	25,000 – 34,999

bimodal distribution, with 25% of the sample having an income of \$35,000 to \$44,999 and another 25% with an income of \$55,000 to \$64,999.

Measures

Early Childhood PTSD. The Posttraumatic Stress Disorder Semi-Structured Interview and Observational Record for Infants and Young Children (Infant PTSD Interview; Scheeringa & Zeanah, 1995; Appendix C) was used to collect symptoms of PTSD in this community sample. For a detailed description of this measure, see the Measures section in Study 1.

Quality of Attachment. The Attachment Q-Sort (AQS, Waters, 1987; Appendix D) was used to measure the quality of the attachment relationships between the participants and their primary caregivers. For a detailed description of this measure, see the Measures section in Study 1.

Salivary cortisol. Saliva was collected according to recommendations outlined in Schmidt (1997). Specifically, parents were asked to have their child either put a sterilized cotton swab in their mouths and get it wet, or spit onto the swab in the tube provided to parents. Parents were educated about the effects of stress (i.e., positive or negative), sub-optimal physical conditions (e.g., lack of sleep, illness etc.) and medications on rates of basal cortisol. They were given a handout (Appendix H) with this information and told to collect the sample on a “normal” day. Saliva was taken at approximately 10 a.m. for each participant, which was at least one hour after eating and drinking. When samples were received from parents, they were kept in a freezer at -20 degrees Celsius until they were analyzed.

The salivary cortisol was analyzed in triplicate using an HS-Cortisol Kit developed by Salimetrics. To obtain the rates of cortisol for each participant, saliva was placed in microtitre plates coated with rabbit antibody to cortisol. Chemical analyses were conducted, including having the cortisol compete with cortisol already linked to horseradish peroxidase for the

antibody binding sites. Unbound components were washed away and the colour of the bound cortisol was measured using an Optical Density reader and compared with standard levels of cortisol prepared in the microtitre plates. Values were provided based on known colours from the chemical reaction. Salivary cortisol is measured in units of microgram per deciliter ($\mu\text{g}/\text{dl}$) and ranged from 0 to 3 $\mu\text{g}/\text{dl}$ (Salimetrics, 2008). The test uses 25 μl of saliva, has a lower limit of sensitivity of 0.007 $\mu\text{l}/\text{dl}$ (range up to 3.0 $\mu\text{l}/\text{dl}$), and average intra- and inter-assay coefficients of variation less than 5% and 10%, respectively. There is no detectable cross-reactivity of the antibody used in this assay with DHEA or testosterone (Salimetrics, 2008). Saliva was also checked for blood contamination, as it is known that blood has much higher levels of cortisol than saliva. One participant was excluded from the study because the results suggested that blood contamination had occurred in the saliva sample.

Results

Data Cleaning

Variables were examined for the assumptions of normality and a transformation was performed as outlined in Tabachnick and Fidell (2001). Specifically, a square root transformation was performed on the PTSD Interview Total Score to reduce positive skewness. Analyses were run with and without the transformations and results suggest that significant differences were not found. Although analyses were conducted with the transformed data, presentation of data in text and tables will be based on raw data for ease of interpretation. Although results using raw versus transformed data were slightly different in some cases, patterns of results did not differ and significance was not affected.

Rate of PTSD Symptoms

PTSD symptoms were found in this community sample, as measured using the Infant PTSD Interview. No participants in this sample met criteria for PTSD, however some did experience symptoms related to negative life events (e.g., being locked in an enclosed space and witnessing community violence). Symptom Scores ranged from 1 to 6, with a mean score of 2.83 symptoms.

Association between PTSD Symptoms and Quality of Attachment

In order to determine whether an association existed between symptoms of PTSD in young children and their quality of attachment with a primary caregiver, a correlation was performed. Results suggested that no significant relationship was found for these variables, $r(10) = -.396$, $p = .203$. It is important to note that a small sample size limits the power to find a significant result. If the correlation between PTSD symptoms and quality of attachment was an accurate estimate of the relationship, a sample size of 45 would have been necessary to find a significant relationship at the conventional α level of $p < .05$ with a power level of .80 (Faul, Erdfelder, Lang, & Buchner, 2007).

Association between PTSD Symptoms and Levels of Salivary Cortisol

The salivary cortisol analysis produced an average cortisol level of 0.36 $\mu\text{g}/\text{dl}$, and ranged from 0.17 $\mu\text{g}/\text{dl}$ to 0.64 $\mu\text{g}/\text{dl}$. Watamura, Sebanc and Gunnar (2001) found that the average cortisol level for their sample (which was taken half an hour later than the present samples, at 10:30am) was 0.16 $\mu\text{g}/\text{dl}$. Similarly, Watamura, Donzella, Alwin and Gunnar's (2003) sample had an average mid-morning home salivary cortisol level of 0.22 $\mu\text{g}/\text{dl}$ (for the infant group) and 0.16 $\mu\text{g}/\text{dl}$ (for the toddler group). This difference in average cortisol level across studies may represent the stress level differences in the current study and Watamura et al.'s two samples, with the current sample having more behaviour and emotional problems.

In order to determine whether an association existed between symptoms of PTSD and levels of salivary cortisol, a correlation was performed. Results suggested that no significant relationship was found for these variables, $r(10) = .357$, $p = .255$. Again, the small sample size limited the power of the analysis and a sample size of 56 would be required to see a significant effect (at $\alpha = .05$), assuming the relationship remained constant (Faul, Erdfelder, Lang, & Buchner, 2007).

Association Between Demographic Factors and Salivary Cortisol

In order to determine whether an association existed between salivary cortisol and demographic factors, correlations were conducted (see Table 13 for a list of factors). Results suggested that child care arrangement (i.e., being cared for by a family member versus a non-family caregiver) and annual income were positively related to salivary cortisol levels. This indicates that those children from families with higher annual incomes and/or who spend time in non-family care had higher rates of salivary cortisol.

In order to understand the relationship between annual income, child care and salivary cortisol, further analyses were conducted. The correlation between annual income and child care was not significant ($r(10) = .46$, $p = .133$). This suggests that annual income is not significantly related to use of non-relative child care in this sample.

Table 13

Correlations between Demographic Factors and Salivary Cortisol

Variable	Correlation (df = 10)	Significance
Child's Age (months)	.527	.078
Child's Gender	.002	.996
Child Care Arrangement	.610	.035
Annual Income	.752	.005
Education Level	.175	.587
Quality of Attachment	.012	.972

Phase II: Multidimensional Approach to PTSD in a Clinical Sample

The objectives of Phase II were to (a) determine the rate of PTSD in a sample of children being referred to an infant and preschool clinic, (b) examine whether quality of attachment is related to symptoms of PTSD, (c) explore whether attachment security moderates the relationship between experiencing a traumatic event and developing symptoms of PTSD, and finally (d) investigate whether general maternal psychological distress is associated with the presence of PTSD in children.

Method

Participants

A sample of families with young children was recruited from an infant and preschool clinic, which serves families of young children who have emotional, behavioural or developmental concerns (a more detailed description of the clinic can be found in Study 1). The clinic works mainly with young children who have experienced a traumatic event(s), but other families were accepted and provided with clinical services depending on their need. The sample consisted of a total of 21 children with an average age of 35 months, ranging from 19 to 67 months and was comprised of 23.8% females. Although some fathers did attend the clinic with their children, mothers were the primary caregivers for all the clients. Seventy-one percent of mothers were biologically related ($n = 15$), 19% were foster mothers ($n = 4$), one was an adoptive mother and one was a step-mother. Table 12 provides a more detailed description of the sample.

Measures

The young children and their families were involved in a comprehensive clinical assessment to determine emotional, behavioural and developmental concerns. Parents were asked to complete a number of questionnaires related to their young child and themselves, including a

demographics questionnaire to collect information about the child's age, gender, ethnic background, as well as family income and the primary caregiver's education. Other relevant assessment measures taken from the larger battery are described in the following section.

Early Childhood PTSD. The Posttraumatic Stress Disorder Semi-Structured Interview and Observational Record for Infants and Young Children (Infant PTSD Interview; Scheeringa & Zeanah, 1995; Appendix C) was used to collect PTSD symptoms. For a detailed description of this interview, see the Measures section in Study 1.

Maternal Psychological Distress. The Brief Symptom Inventory (BSI; Derogatis, 1993) measured symptoms of psychological distress for primary caregivers in this sample. The measure of symptomatology that was used in the main analyses was the Global Severity Index. For a detailed description of this measure, see the Measures section in Study 1.

Quality of Attachment. The Attachment Q-Sort (AQS, Waters, 1987; Appendix D) measured the quality of the attachment relationship between the participants and their caregivers. For a detailed description of this measure, see the Measures section in Study 1.

Experience of Trauma. Participants were given a dichotomous score of 0 or 1 depending on the presenting concern. If the child was accessing services as a result of a traumatic experience (or a traumatic event was identified during the assessment as an antecedent to the presenting concern) the child was given a score of 1. If no event was identified as traumatic in the child's history, according to parental report on the Infant Life Events Scale (Study 2) and the Infant PTSD Interview, the child was given a score of 0.

Results

Data Cleaning

Variables were examined for the assumptions of normality and transformations were performed as outlined in Tabachnick and Fidell (2001). Square root transformations were performed on the PTSD Interview Total Score to reduce positive skewness and on the Brief Symptom Inventory Global Severity Index to reduce positive skewness. Analyses were run with and without the transformations and results suggest that significant differences were not found. Although analyses were conducted with the transformed data, presentation of data in text and tables will be based on raw data for ease of interpretation. Although results using raw versus transformed data were slightly different in some cases, patterns of results did not differ and significance was not affected.

Cultural Confounds

Given that almost 40% of the sample in Phase II was composed of children from First Nations (14.3%) or Métis (23.8%) backgrounds, preliminary analyses were conducted to examine whether differences were found for PTSD Total Score, maternal psychological distress and quality of attachment across Aboriginal and non-Aboriginal cultural groups. A significant mean difference was found only for quality of attachment, $t(16) = -2.408, p = .028$, with the Aboriginal group demonstrating a lower quality of attachment overall ($n = 7, M = .003, SD = .153$) as compared to the non-Aboriginal group ($n = 11, M = .239, SD = .227$).

Rate of PTSD in a Clinical Sample

Symptoms endorsed on the PTSD Interview were summed to provide a PTSD Symptom Score where scores could potentially range from 0 to 30. Symptoms were also dichotomized (present/not present) and summed for each symptom cluster. A diagnosis of PTSD was

determined based on whether all the criteria were met according to the PTSD criteria of the DC: 0-3R (see Table 1 for a description). Thirty-three percent (7/21) of the children in this sample met criteria for PTSD as measured by the Interview. Ten children were referred to the clinic for trauma-related concerns (e.g., primary caregiver's suspected that traumatic events were associated with current difficulties in functioning). Of these ten children, six met criteria for PTSD (60%). This finding falls within the range of 26%-69% found in other studies of known traumatized young children (Scheeringa, Zeanah, Myers & Putnam, 2003). Ten children were referred for behaviour problems and only one of these children was found to have PTSD. One child was referred for developmental concerns, and this child did not meet criteria for PTSD.

Association between PTSD symptoms and quality of attachment

In order to determine whether attachment security was associated with the number of PTSD symptoms, a correlation was conducted ($n = 19$). Two participants had to be excluded from this analysis because they did not complete the Attachment Q-sort. Results demonstrated that quality of attachment was negatively related to number of PTSD symptoms, $r(17) = -.64, p = .003$, indicating that children with high PTSD symptom scores were more likely to have low quality of attachment.

Association between PTSD symptoms and maternal psychological distress

In order to determine whether caregiver psychological distress was related to symptoms of PTSD a correlation was performed ($n = 18$). Three participants who did not complete the Brief Symptom Inventory were excluded from this analysis. Maternal psychological distress was not significantly related to number of PTSD symptoms ($r(16) = .29, p = .240$). As a result of the small sample size power to detect a significant difference was limited. If the correlation between PTSD symptoms and maternal psychological distress is an accurate estimate of the relationship,

a sample size of 79 would have been necessary to find a significant relationship at the conventional $\alpha = .05$ level with a power level of .80 (Faul, Erdfelder, Lang, & Buchner, 2007).

Moderating role of attachment for experience of trauma and PTSD symptoms

A hierarchical multiple regression was conducted in order to examine whether quality of attachment would be predictive of PTSD symptoms after controlling for the experience of trauma (presence or absence of an event) and whether the connection between the experience of trauma and PTSD symptoms would vary depending on quality of attachment. Using number of PTSD symptoms as the criterion variable, the experience of trauma was entered in Step 1 followed by quality of attachment on Step 2. An interaction between the experience of a trauma and the quality of the attachment relationship was entered on Step 3 to evaluate quality of attachment as a moderator.

The experience of a trauma on its own was found to be marginally related to PTSD symptoms on Step 1, $F(1, 17) = 3.198, p = .092$, accounting for 16% of the variance ($\beta = .398$). The inclusion of quality of attachment on Step 2 accounted for an additional 38% of the variability in PTSD symptoms with F -change $(1, 16) = 12.866, p = .002$. An inspection of the standardized beta weights for Step 2 revealed that both the experience of a trauma ($\beta = 3.61; t(16) = 2.11, p = .051$) and quality of attachment ($\beta = -.614; t(16) = -3.59, p = .002$) were uniquely predictive of PTSD symptoms such that the presence of trauma and lower quality of attachment were predictive of more extensive PTSD symptoms.

The addition of the interaction involving the experience of trauma and quality of attachment on Step 3 did not yield a significant increment in variance accounted for, F -change $(1, 15) = .832, p = .376$, with a $\beta = .195; t(16) = .912, p = .376$, suggesting that attachment security did not moderate the link between the experience of trauma and PTSD symptoms.

Discussion

By definition, the development of PTSD must be preceded by an event or experience for which the child perceives a risk to his/her survival. However, an event or experience is not sufficient for the development of PTSD, as evidenced by the fact that not all children exposed to traumatic events develop PTSD or even experience significant stress as a result of the event. The purpose of Study 3 was to better understand the associations between stress and trauma resulting from specific events and the child's behavioural reactions (i.e., PTSD symptoms), physiology (i.e., cortisol level), relational correlates (i.e., quality of attachment) and parental factors (i.e., maternal psychological distress).

In Phase I, the effects of stress resulting from a particular event were considered, as measured by PTSD symptoms in a community sample. Analyses did not find a significant relationship between PTSD symptoms and quality of attachment. Although the effect size for this analysis was moderate, the sample size was too small to detect a significant connection. It may be the case that an association would be found with a larger sample size. An alternative hypothesis may be that the symptoms of PTSD from the experience of a negative life event (without more severe stress related to traumas) are not associated with quality of attachment.

In 2000, Scheeringa and Gaensbauer stated that "no study has been published yet which concurrently assessed for PTSD and attachment symptoms" (pp. 375). Although the negative relationship between PTSD symptomatology and attachment has been hypothesized based on findings from previous studies related to harm and risk to primary caregivers, prior to the present study this relationship has not been empirically shown. The strong association between higher PTSD symptom scores and low quality of attachment in Phase II with a clinical sample provides important information in our understanding of the effects of PTSD on young children.

Researchers have demonstrated a relationship between quality of attachment at the time of everyday stressors (e.g., inoculations; Gunnar, Brodersen, Nachmias, Buss, & Rigatuso, 1996), but this is the first time that quality of attachment has been shown to be associated with symptoms of PTSD for children exposed to severe stressors (i.e., trauma). In considering results from Phase I and Phase II, it will be important to better understand whether the quality of attachment is only related to PTSD symptoms when a *traumatic* event is experienced, or whether the experience of a negative life event is sufficient stress to result in a link between symptoms and attachment. This could be determined by studying the relationship between attachment and PTSD symptoms in a larger sample of young children who have experienced negative life events that were not necessarily considered traumatic (e.g., moving to a new home).

The connection explored between symptoms of PTSD and maternal psychological distress in Phase II was not observed to be statistically significant in the present study, although the size of the relationship was moderate in magnitude. Future research should further examine this relationship in a follow-up study. If the nature of the connection remains the same, this would suggest that maternal functioning may be impacted and/or impact the development of PTSD in young children. This link has been a source of speculation, based on research with older children (Scheeringa & Zeanah, 1995), in that older children whose mothers were experiencing psychological distress showed more negative outcomes to traumatic events (e.g., more behavioural and emotional problems). However, this relationship has not been empirically shown in a sample of infants and young children. The limited treatment literature for PTSD in infants and young children discusses the importance of providing treatment for parents, if necessary, to ensure that they have the emotional resources to support their child following a traumatic event (e.g., Gaensbauer & Siegle, 1995; Gaensbauer, 2000; Scheeringa 1999). However, this literature

is based on clinical experience and has not yet been supported by empirical evidence. Therefore, although the results of this study are preliminary given the limited sample size, the research is notable because it has not been empirically tested before.

Further research is required to determine whether high quality of attachment prior to a traumatic event acts to protect the child from the ongoing effects of a trauma (i.e., the development of PTSD) or whether poor quality of attachment develops following a traumatic event. If it is in fact the latter, it may be that a child who experiences trauma is unable to use the parent as a secure base as a result of loss of trust or fear at not receiving protection at the time of the event. It is also possible that following a trauma, the parent is no longer able to provide responsive caregiving to the child because of the parent's own distress or the child's increased needs for emotional support. Prospective longitudinal research could be conducted to answer this question, such that children exposed to traumatic events are immediately recruited, assessed for prior functioning to establish a baseline, and followed over time to understand the factors surrounding the event and the child and family characteristics that increase the child's risk of developing PTSD.

Results in Phase I demonstrated a positive relationship for basal cortisol level and annual family income. This may suggest that parents with higher incomes may be required to work longer hours thereby decreasing the time they have with their children or perhaps parents have increased stress as a result of the types of employment they have and this stress may be felt by their children as well.

In addition to a connection found with annual income, a significant positive relationship was also found with cortisol level and care with non-relatives. Care by a non-relative may result in increases of basal cortisol levels for young children. This finding is consistent with Watamura,

Donzella, Alwin and Gunnar's (2003) research on cortisol level in young children who attend day care. These authors found that young children show increases in cortisol throughout the day when in daycare, and decreases when they are at home, suggesting that children experience more stress at daycare. The average cortisol level in the present study was found to be higher than the averages found by Watamura and colleagues (2003) and Watamura, Sebanc and Gunnar (2001) in their studies of young children in daycare. This higher average cortisol level may reflect increased stress of the current sample, in which the children were included in the study because of their higher behavioural and/or emotional problems, as measured by the CBCL Total Score.

A significant relationship was not found for PTSD symptoms and cortisol level in the community sample of Phase I. However, similar to other analyses in Phase I the effect size was moderate. It may be that with a larger sample size, we may see this relationship become significant suggesting that greater symptoms of PTSD is related to greater stress reflected in basal cortisol levels. However, if this relationship is not validated with a larger sample size, it may be that stress from a negative life event is not enough to disrupt the stress-response functioning, as seen with basal cortisol levels. It is interesting to note that the basal cortisol levels in this sample are higher than in previous samples. The participants in Phase I were chosen from a larger community sample because of their higher levels of behavioural and emotional problems. These higher levels may suggest these children are experiencing higher rates of stress. Previous research has shown that in older children, emotional problems are related to higher rates of cortisol (Stansbury & Gunnar, 1994).

As a result of the destroyed data from the clinical sample, the physiological effects of PTSD were not examined in Phase II of the present study. This is an area for further follow-up, as I have shown that although the cortisol samples were not able to be analyzed, it was possible to

obtain these samples from families caring for traumatized young children. Further research in this area will provide important information on a key physiological marker of PTSD in this population.

A limitation in this study may be the fact that a significant mean difference was found for quality of attachment for Aboriginal and non-Aboriginal groups. This may reflect differences in parenting practices across cultures, with parents and children responding differently depending on their cultural group. Therefore, it may be problematic to assume that attachment behaviours across groups are consistent. Alternatively, the difference may reflect the fact that all the non-Aboriginal children were living with their biological mothers, while the majority of Aboriginal children (four of seven) were living with non-biological mothers (foster mothers, a step-mother and an adoptive mother). Children living with non-biological mothers would likely require time and opportunity to develop attachment relationships with their caregivers, reflecting their lower quality of attachment.

Small sample size was an obvious limitation in both phases of Study 3, thereby limiting the power to detect significant connections even when the effect sizes were of a moderate size. Future studies will need to replicate results with larger sample sizes. As a result of the small sample sizes, both PTSD and attachment quality were analyzed as continuous variables instead of dichotomous or grouped scores (i.e., PTSD symptoms versus PTSD diagnosis, and quality of attachment versus attachment style) which limited the ability to explore the effects of having a diagnosis of PTSD versus the significant stress related to experiencing negative life events. The diagnosis of PTSD assumes that an individual is having difficulty coping with the acute stress commonly experienced following a traumatic event. Therefore, it may be the case that there is something inherently different for the child who overcomes their distress to a trauma versus a

child that cannot. However, Scheeringa, Zeanah, Myers and Putnam (2005) found that following exposure to trauma, young children's symptoms do not ameliorate over time, regardless of whether they have a diagnosis of PTSD. Although the sample sizes limited our ability to find a number of significant results, the findings have provided areas for further advancement in future research.

General Discussion

Gaining a better understanding of the nature of trauma in infancy will have significant implications for both research and clinical practice. Currently, trauma is a growing area of interest because of the much-publicized issues surrounding terrorism and war. Research and education is continuing in the area of trauma and PTSD in adults and older children, however trauma on young children continues to be overlooked and under-identified. This is increasingly problematic as statistics suggest that young children are particularly vulnerable to exposure to certain types of traumatic experiences. The Canadian Incidence Study of Reported Child Abuse and Neglect (CIS, 2003) showed that of all the cases of child maltreatment (i.e., physical abuse, sexual abuse, neglect, emotional maltreatment and exposure to domestic violence) in Canada for children under sixteen, children 0-3 years made up 22.5% of cases of substantiated maltreatment. The report found that children 0-3 years are most at risk for witnessing domestic abuse above all other age groups, often because they are in the home with the primary caregiver more often than older children. In addition, Bingham and Harmon (1996) reported that the greatest number of fatalities from child abuse occur in infancy and preschool-age. Apart from maltreatment, young children also experience other types of traumatic events, such as painful medical procedures, motor vehicle accidents, situations surrounding war and natural disasters (such as floods and ice storms). The effects on young children of exposure to traumatic events need to be considered and better understood.

Evidence is emerging to suggest that infants and young children are affected by traumatic events in both similar and different ways to adults and older children. As more empirical research is conducted and professionals become more skilled at identifying and intervening with traumatized young children, a clearer picture of the development, experience and maintenance of

PTSD will evolve. The effects of an untreated PTSD can be devastating, as determined by Scheeringa, Zeanah, Myers and Putnam (2005) in a longitudinal study of PTSD in infants and young children. The authors found that unlike older children and adults, younger children's PTSD symptoms did not remit over a two-year period. In fact, the authors found that this unremittance was found even for children who did not meet a full diagnosis of PTSD but who demonstrated some symptoms of PTSD following a traumatic event. The authors hypothesize that these findings may suggest that early traumatic events can have a more permanent impact on the child, perhaps creating neurobiological vulnerability in the developing brains of young children. This finding speaks to the importance of better understanding and treatment of PTSD in young children.

This dissertation answered some important questions about the nature of PTSD in early childhood, by describing the types of events that researchers need to be aware of when assessing young children, providing information on the reaction of young children at the time of potentially traumatic events, examining a method of identifying those at risk for developing PTSD, exploring the child and family characteristics that may predict or result from PTSD and finally, providing insight into possible areas for further exploration in the treatment of young children exposed to traumatic events.

The Event

Scheeringa and Zeanah (1995) found that younger children (under 4 years), compared to older children, experienced more symptoms of PTSD if the traumatic event involved harm to a caregiver versus harm to the child. The authors hypothesized that either young children understood the threat to themselves as a result of threat to their primary caregiver or, alternatively, the primary caregiver was perhaps traumatized and this impacted his/her ability to

respond sensitively to his/her child. The results of Study 2 provide support for the hypothesis that more symptoms of PTSD are related to events that involve a caregiver. Specifically, results found that children who experienced a natural disaster, such as a storm or tornado, and who witnessed a close family member get hurt or fall had higher symptoms of PTSD. It is interesting to note that in this young population these events likely involved caregivers, either because the caregiver was hurt or fell, or because the caregiver would have been present during a storm or natural disaster. In addition, these events associated with higher symptoms of PTSD were not ones that directly involved harm to the child. It should be noted, however, that there were a number of events that would have involved the primary caregiver, such as “Witnessed harm/violence to you or another important person”, which did not have a significant correlation with PTSD symptoms.

The findings from Study 2 provide important information for parents and professionals working with young children. Awareness of the types of events that put children at higher risk of developing PTSD may improve identification of young children. Learning more about the specific factors that makes these events traumatic, such as the severity of the event, the circumstances surrounding the event etc., would be helpful in understanding if underlying factors can be generalized to different types of events. In addition to recognizing the events related to PTSD, it is also important to understand the child’s reaction at the time of an event in order to offer early intervention to those most at risk of developing PTSD.

Reaction at the Time of the Event

Research with older children and adults has suggested that reaction at the time of the event is predictive of the development of PTSD. Specifically, children who react strongly with intense fear or helplessness and adults who dissociate at the time of an event are more likely to develop

PTSD (Fletcher, 2003; Brunet, et al., 2001). Results from Study 2 suggested that in this young population, there was no significant relationship between a child's reaction, according to parent-report, at the time of an event and number of PTSD symptoms. In fact, the events that were associated with a greater number of symptoms were not recognized by parents as negative and causing a strong reaction at the time of the event (i.e., harm to important family member and experiencing a storm or natural disaster). This finding may provide some insight into the reason why many young children are not receiving psychological services following a traumatic event. It may be the case that young children do not react to traumatic events in such obvious ways as older children and adults, and can likely not verbally relate these experiences. Young children have limited verbal skills (i.e., crying) to express feelings such as hunger, pain, fear, and loneliness and parents may not always accurately perceive their children's feelings as a result. It may be that parents have a hard time differentiating these reactions at the time of a trauma, and may have the impression that the negative effects will be temporary. Alternatively, parents may view a potentially traumatic event using an adult lens instead of taking the younger child's perspective, thereby not recognizing when certain events may be traumatic. Future research should follow young children immediately following a traumatic event in order to understand the development of the symptoms over the first few hours and weeks following the event.

With a sense of the types of events that put a child at greater risk of developing PTSD, and knowing that a child's reaction at the time of the event does not necessarily suggest that the event was particularly traumatic, it is also important to have a method of quickly collecting information on symptoms related to PTSD. An effective screening tool will aid in the identification of those who may be at risk for PTSD.

Screening Children with PTSD

The current method of assessing for PTSD in young children is to have a trained clinician conduct an interview with parents in order to collect information on the presence of symptoms. This method is somewhat lengthy and cumbersome, particularly if a clinician is trying to differentiate between many possible diagnoses for a young child with emotional or behavioural problems. A measure like the Child Behaviour Checklist, which includes many problems found in early childhood, is a helpful tool that can be used by clinicians working with this population. The PTSD subscale of the CBCL, as described in Study 1, could provide clinicians with a quick, efficient way of screening those children at risk for PTSD. Children who have symptoms from each of the clusters on the PTSD subscale would receive further assessment to determine whether a diagnosis is appropriate and whether intervention is needed. Such a quick, efficient screener may also identify more cases of PTSD, thereby increasing opportunities to conduct research with this vulnerable population.

Interestingly, the PTSD subscale was able to identify those children at risk for PTSD, even when an event was not identified prior to screening. A number of the children in Study 1 did not have an identified trauma prior to being referred to the Infant and Preschool Clinic and the majority of these children did not meet criteria for PTSD. Therefore, although a diagnosis requires a specific event to be identified, the screening tool can look at patterns of symptoms, without knowledge of an identified event, in order to determine whether a diagnosis is likely.

Findings from Study 1 suggested that children who had younger mothers and higher internalizing scores on the CBCL were at higher risk of being incorrectly screened for PTSD. Although it is, as yet, unclear exactly why children with younger mothers are more likely to be incorrectly classified as having PTSD using the screening measure, it is important to be aware of

this information when using the screener. Perhaps younger mothers rate their children's behaviour higher than older mothers, thereby increasing the likelihood of being incorrectly classified. Or perhaps younger mothers are more anxious about their parenting and this anxiety is represented by higher scores on the CBCL. The results of Study 1 also suggested that children with higher internalizing scores on the CBCL are more likely to be incorrectly classified with PTSD, which might suggest that it is important for clinicians to screen for other anxiety disorders when trying to differentiate PTSD from another psychological problem. Understanding why younger mothers and those with higher internalizing scores are more likely to be incorrectly identified using the PTSD subscale is an important area for further examination.

With a method of screening children at risk for PTSD, it can be helpful to have an understanding of the factors that may put a child at greater risk of developing PTSD.

Risk Factors for the Child

Although the experience of a traumatic event is a necessary component in the development of PTSD, it is not sufficient for a diagnosis. The research findings in this dissertation have shown that a number of factors in the child's life impact their ability to cope with the stress of a negative experience.

Scheeringa and Zeanah (1995) described the important role that the primary caregiver plays in both the safety and the emotional development of the infant and young child. The infant responds to internal cues (e.g., hunger and fatigue) with crying and whining. The responsiveness of the caregiver to the child sends the message that the parent is available to provide for and protect the child. Over time, this responsiveness helps the child to self-regulate, as they come to depend on the idea that someone will be there to help them or provide for them. When children know that their caregiver will protect and provide for them, they have a higher quality

attachment relationship with that caregiver (Ainsworth, Blehar, Waters, & Wall, 1978). Past research has shown that this attachment relationship is associated with a child's ability to cope with stress (i.e., children with higher quality attachment relationships cope better with stress than those with lower quality attachment). Although quality of attachment was not shown to be significant in Phase I of Study 3, it is unclear whether this is because a significant relationship does not exist in a community sample or because of a lack of power to detect a significant difference as a result of the small sample size. In Phase II of Study 3, a very strong relationship was found for quality of attachment and trauma-related stress in the clinical sample. Findings from Phase II suggest that low quality of attachment relationships may put a child at increased risk of developing PTSD and should be assessed with symptoms of PTSD following a trauma. Future research in a larger sample should examine the moderating role of attachment in traumatized children with and without PTSD.

A less well-identified risk factor is maternal psychological distress and the impact of lower maternal functioning on the development of PTSD. Results from Phase II of Study 3 found a moderate effect size for this relationship, but no statistical significance. Previous research in this area with older children suggests a strong association with parental functioning and child outcomes following a traumatic experience (Scheeringa and Zeanah, 1995). These authors have hypothesized that this relationship may be even more important for young children, as a result of children's heavy reliance on parental functioning for their survival. Further empirical research in this area will help to answer this important question.

Understanding the factors that increase the risk of developing PTSD following a traumatic event is important for better identification of children at risk, and these factors also provide information for treatment with this population.

Treatment Considerations

To date, no empirical literature has emerged for treating PTSD in young children. Clinicians have written about their own strategies from clinical practice based on their understanding of stress and development, and based on the literature focused on working with older children and adults (Gaensbauer & Siegle, 1995; Gaensbauer, 2000; Scheeringa 1999). However, a dearth of systematic research continues to exist for optimal intervention with young traumatized children who have limited cognitive and verbal capabilities. The present dissertation has suggested some areas that should be examined for further treatment considerations.

The strong relationship between quality of attachment and PTSD symptoms in the clinical sample suggests that the attachment relationship plays an important role in the course of PTSD. This suggests that intervention to strengthen attachment security (making the young child feel secure and protected) following a trauma will be important for decreasing the impact of the trauma. By definition, the experience of a trauma leaves an individual feeling insecure and unprotected, therefore strengthening the attachment relationship is a direct way to resolve these feelings through intervention. Similarly, providing intervention to the child through supporting a secure attachment relationship also acts to protect the relationship itself from being affected as a result of the trauma. For example, the child may have difficulty interacting with their caregiver in the way they did prior to a trauma (e.g., demonstrating a decreased interest in being soothed and comforted by the caregiver as a result of increased arousal, making it more difficult for a parent to be responsive to the child's needs). Following from this, a parent with mental health issues may find it difficult to remain responsive to a child's many needs (Laucht, Esser & Schmidt, 2001). Therefore, providing treatment for caregivers with mental health issues will

likely enable caregivers to be more responsive to their young children, thereby improving the quality of attachment.

Other treatment considerations include early intervention for those children who experience negative events involving a caregiver. Identifying those children at risk immediately following an event will help to prevent longer term PTSD symptom development and provide parents and children with support before negative behaviour and emotional patterns develop. Similarly, psycho-education for parents of children exposed to early negative events may help parents to more accurately identify trauma symptoms, thereby avoiding common attributions of behavioural or emotional problems to personality or normal developmental changes (i.e., terrible twos).

When considering the findings from all three studies that comprise this dissertation, results advance our understanding of PTSD for infants and young children, and provide direction for further research in this field.

Other Important Considerations

Sample Size. Small sample sizes have limited the power of some of the analyses in this dissertation to detect significant differences. Recruitment of clinical cases proved difficult for the purposes of this dissertation. Not only has this difficulty restricted my ability to more fully understand the impact of PTSD in this vulnerable population, it also speaks to the larger issue of why young children are not recognized as suffering from the effects of trauma. Previous studies of PTSD in young children have also had limited sample sizes. The first systematic studies conducted with young traumatized children combined both published case studies and clinical cases that had been treated previously by the authors. To date, the largest empirical study on infant trauma consisted of 62 cases, recruited over 18 months in a trauma clinic located in a large

American city (Scheeringa, Zeanah, Myers, & Putnam, 2005). Although Canadian statistics suggest that 22% of maltreatment cases occur to children under 4 years (CIS, 2003), it seems this population's mental health continues to be overlooked by parents and professionals working with these families.

Study 2 provided some insight into why it may be difficult for parents and professionals to identify young children at risk. Specifically, the findings suggested that parents may have a difficult time recognizing the types of events that are traumatic for young children. This may be related to young children's limited verbal abilities and their limited ways of expressing themselves (i.e., crying to signify hunger, fear, and tiredness etc.). We also know that young children's inability to verbally relate, and even remember, traumatic events in early childhood makes it difficult to know what a child has been exposed to. Similarly, it may be the case that parents of young children who have experienced a traumatic event may be too emotionally overwhelmed themselves to access services for their child. Education regarding the impact of a traumatic experience on emotional, physiological and cognitive development will be important for parents and professionals working with young children. Examination of the barriers to identification and treatment of young traumatized children should also be considered in future research.

Cultural Confounds. Ethnic and cultural differences were not explored in significant detail in this dissertation, even though significant proportions of the samples were of First Nations and Métis background. Examination of cultural differences was difficult because of the small samples sizes and the lack of understanding of the effects of culture on the different outcome measures. Although some measures have been validated in different cultural groups (e.g., the Child Behavior Checklist has been shown to be reliable and valid in over 50 cultural groups and

attachment behaviours have been shown to be present in many cultures of the world), they were not standardized on the First Nations and Métis communities that composed part of the samples found in this dissertation. Therefore, it is possible that patterns of items endorsed for measures such as the CBCL may be considered problematic for one culture and not for another. It should be noted that in Phase II of Study 3, where First Nations and Métis children made up 40% of the sample, significant differences were not found for PTSD Total Score or maternal psychological distress. However, differences were found for quality of attachment in the Aboriginal groups compared to the Caucasian group. With a small sample size it is difficult to generalize findings, however this difference may be related to different parenting practices that do not translate across cultures. Alternatively, the difference may reflect the fact that non-Aboriginal children were all living with their biological mothers, while the majority of Aboriginal children were living with non-biological mothers. Children living with non-biological mothers would require time and the opportunity to develop attachment relationships with their caregivers and this may be reflected in their lower quality of attachment. Confounding factors related to the assumption that results are similar across cultural groups should be considered more fully in future research.

Repeated Versus Single-Event Trauma. In Study 2, the Infant Life Events Scale did not include a direct question related to the experience of abuse (see Methods section of Study 2 for a description). Although a direct question about physical abuse was not asked, the types of injuries that result from physical abuse based on research of emergency room visits for those with substantiated abuse histories were included. Similarly, a question related to witnessing harm to a close family member was included to cue parents to report on witnessing domestic violence. It should be noted that Herman (1997), in her work with adults exposed to chronic traumatic situations (e.g., domestic violence, prison camps etc.) has suggested that a different category of

PTSD should be created to account for different symptom presentations seen in single versus repeated traumatic events. Similar differences were found by Terr (1991), who reported that differences in symptoms of PTSD were common for young children who had experienced repeated traumas (e.g., abuse) versus those who were exposed to a single traumatic event (e.g., a dog bite or a car accident etc.). She suggested that children who experienced repeated traumas demonstrated more symptoms of denial and numbing, dissociation and rage, while those who experienced a single event demonstrated more detailed memories of the event and experienced more “omens” and misperceptions. Although single versus repeated trauma was not differentiated in the present study, it is an area that requires further examination, particularly as research continues to expand for adults and older children.

Conclusions and Future Directions for Research

A number of findings from this dissertation are consistent with previous empirical and theoretical research. Specifically, it is clear from the results of all three studies that in order to gain a comprehensive understanding of early childhood trauma and PTSD, young children must be considered in the context of their environment with a particular focus on the primary caregiver. Specifically, findings suggest that events likely involving primary caregivers are associated with more symptoms of PTSD; parents are responsible for providing information about their child’s functioning following a trauma and are therefore essential in understanding the child’s experience of a trauma; and finally, the quality of the attachment relationship is directly related to symptoms of PTSD in clinic-referred children. Similarly, results suggest that maternal functioning may impact symptoms of PTSD, although this needs to be more fully examined in a larger sample of young children. All of these findings point to the importance of

directly involving caregivers in the provision of psychological services to young traumatized children.

With regards to future directions for research, results from this dissertation point to the importance of implementing prospective longitudinal methodology with this population. Recruitment immediately following traumatic experiences, by connecting with trauma centres, emergency rooms of hospitals, the police force and social service agencies will allow for the collection of information about the event, the reaction, the prior family factors (e.g., family stressors, parental psychological distress) and prior child factors (e.g., temperament, regulatory patterns such as sleep and eating patterns), physiological factors (e.g., cortisol levels immediately following the event), and relationship factors (e.g., quality of attachment). The families can then be followed and these factors monitored for changes over a period of months. This type of research methodology will greatly contribute to our understanding of the factors that impact coping following a traumatic event and the factors that contribute to the development of PTSD.

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Appendix A: Assessment Protocol Checklist

	Completed?	Date (dd/mm/yy)
First Contact		
➤ Phone Intake	<input type="checkbox"/>	__/__/__
Mail Out Materials		
➤ Brief Symptom Inventory	<input type="checkbox"/>	__/__/__
➤ Modified CBCL	<input type="checkbox"/>	__/__/__
➤ Infant Life Events Scale	<input type="checkbox"/>	__/__/__
Assessment: Interview 1		
➤ Consent Form	<input type="checkbox"/>	__/__/__
➤ Demographics Form	<input type="checkbox"/>	__/__/__
➤ PTSD Interview	<input type="checkbox"/>	__/__/__
➤ Crowell Procedure	<input type="checkbox"/>	__/__/__
Questionnaires to Take Home 1		
➤ ECBQ (Shyness Subscale)	<input type="checkbox"/>	__/__/__
➤ Cortisol	<input type="checkbox"/>	__/__/__
➤ Conflict Tactics Scale (Form B)	<input type="checkbox"/>	__/__/__
Assessment: Interview 2		
➤ Developmental Assessment	<input type="checkbox"/>	__/__/__
➤ Stillface	<input type="checkbox"/>	__/__/__
Questionnaires to Take Home 2		
➤ Conflict Tactics Scale (Form A)	<input type="checkbox"/>	__/__/__
➤ Attachment Sort Cards	<input type="checkbox"/>	__/__/__
Assessment: Interview 3		
➤ Attachment Q-sort	<input type="checkbox"/>	__/__/__
➤ Parenting Stress Index	<input type="checkbox"/>	__/__/__
Assessment: Interview 4		
➤ Modified AAI	<input type="checkbox"/>	__/__/__
➤ Impact of Events Scale-Revised	<input type="checkbox"/>	__/__/__
Feedback Session	<input type="checkbox"/>	__/__/__
Report	<input type="checkbox"/>	__/__/__
Referral	<input type="checkbox"/>	__/__/__
Therapy?	<input type="checkbox"/>	__/__/__
Comments:		

Appendix B: Consent Form

INFANT AND PRESCHOOL CLINIC
University of Saskatchewan

INFORMED CONSENT FORM

We are asking you to take part in assessment and feedback sessions provided by the Infant and Preschool Clinic of the Psychology Services Centre of the Department of Psychology, University of Saskatchewan and to give permission for your child (children) to participate.

Contact Information: Department of Psychology, University of Saskatchewan
Leah Hatton, 966-2323
Alissa Schactman, 966-2323
Dr. Debby Lake (Clinical Supervisor), 966-2634
Dr. Patti McDougall (Research Supervisor), 966-8957

Purpose and Procedure: You will be asked to participate in an assessment that will take place over approximately four sessions. Each session will take from one to two hours. During the assessment sessions you will be asked to provide information about yourself and your family. Information will be collected by interviews, paper-and-pencil questionnaires and observations of you and your child taking part in different activities in the playroom. For example, we will collect information to learn more about your child and your family, including your concerns, your child's behaviour and development, and your relationship with your child. We are also interested in learning more about children's stress-response systems and will invite you to collect saliva samples from your child for this purpose. Following the assessment, you will have the chance to discuss treatment options with your therapist.

Potential Benefits for Participation: Although there are no anticipated direct benefits to participants, it is our hope that this research will contribute to a greater understanding of young children with early stressful experiences and/or challenging behaviors. As such, this research may benefit other families with similar concerns for their children.

Confidentiality: Any information you provide will be kept in strictest confidence. However, the clinic staff has a professional and legal responsibility to report to the appropriate authorities if there are reasons to suspect that a person is at risk of harming themselves or someone else, if there is suspicion that a child is being abused, or if files are subpoenaed by a court of law.

Information used for research purposes will be combined to look at averages and group data. No identifying information (such as names, occupations, addresses or phone numbers) will be connected to the data. Research involving group findings may be used in the completion of doctoral theses, in journal publications or presented at scholarly conferences.

Research and the Right to Withdraw: The Infant and Preschool Clinic is a teaching clinic. Information that you provide during the sessions may be used for research purposes, with your

consent. If you do not want your information to be used for research purposes, you will still have access to all clinical services offered by the Infant and Preschool Clinic.

Storage of Data: All written and video/audiotaped information you provide will be stored in a secure, locked area where it will be kept in strictest confidence. This information will be stored for a minimum of five years after completion of the research project. Clinically relevant information will be stored for ten years. After that time, all data will be systematically destroyed by the clinical supervisor.

Questions:

If you have any questions, please feel free to ask at any point; you are also free to contact any of the people listed above if you have questions at a later time. I understand that this study has been approved on ethical grounds by the University of Saskatchewan Behavioural Sciences Research Ethics Board on (May 24, 2006). Any questions regarding your rights as a participant in research may be addressed to that committee through the Office of Research Services (966-2084). Out of town participants may call collect.

Consent to Participate: I have read and understood the information provided above. I have been provided with an opportunity to ask questions and any questions have been answered satisfactorily. A copy of this consent form has been offered to me for my records. I consent to:

- Yes, I consent to participate in clinical services as described above.
- Yes, I consent to allow my sessions to be video/audiotaped.
 - No, I do not consent to allow my sessions to be videotaped.
- Yes, I consent to allow the information I provide to be used for research purposes.
 - No, I do not consent to allow the information I provide to be used for research purposes.

I understand that, at any time, I can decide not to continue in clinical and research activities and can withdraw consent for my material to be used for clinical and/or research purposes at any time. My signatures below indicate that I have read and understand the above information and the conditions for taking part in the Infant and Preschool Clinic. My signature indicates that I agree to participate and give my permission for my child(children) to participate under these conditions.

Witness Signature

Legal Guardian Signature

Date

Legal Guardian Signature

Appendix C: Family Information Form

Present at Today's Interview (Please identify yourself by circling your name)

Name	Age	

What Adults and children live with this child?

Name	Sex	Age	Relationship to Child

Your current marital status

Single	<input type="checkbox"/>
Common-law	<input type="checkbox"/>
Married	<input type="checkbox"/>
Separated	<input type="checkbox"/>
Divorced	<input type="checkbox"/>
Widowed	<input type="checkbox"/>

What is the cultural background of the biological mother?

First Nations Metis Caucasian
 Black Asian Other(specify): _____

What is the cultural background of the biological father?

First Nations Metis Caucasian
Black Asian Other(specify): _____

What is the child's first language? _____

What is your first language? _____

What is the highest level of education you have completed? _____

Your job, work or occupation (e.g., homemaker, student, salesclerk, mechanic, nurse, architect...)

Hours in a week child is cared for by someone other than you _____

What is the nature of this care arrangement? (Check all that apply)

Day care _____
Preschool _____
Care by a relative _____ Specify relationship _____
Other(please specify) _____

Child's Biological Mother's

Name: _____ Age _____ Birthdate(y/m/d): _____

Child's Biological Father's

Name: _____ Age _____ Birthdate(y/m/d): _____

Marital status of biological parents at birth of child: _____

Current marital status of child's biological parents: _____

Target child's birth order (oldest, second-born, youngest, etc) _____

Are you currently seeing any other health professional about the issues that brought you here today?

Yes _____ Who?(name and profession) _____

No _____

Income:

Please indicate your personal income before taxes. Include income from all sources - wages, salaries, pension benefits, child benefits, social assistance, money from relatives, income from self-employment, grants, subsidies, unemployment insurance, maternity leave benefits, workers compensation and so forth.

Weekly, monthly and yearly income equivalents are listed here. Please **circle** the amount in the category that represents your current income.

Weekly	Monthly	Yearly
\$192 or less	\$750 or less	\$9,999 or less
\$193 -288	\$751 - 1250	\$10,000 - 14,999
\$289 – 385	\$1251 - 1667	\$15,000 - 19,999
\$386 - 480	\$1668 - 2083	\$20,000 - 24,999
\$481 - 673	\$2084 - 2917	\$25,000 - 34,999
\$674 - 938	\$2918 - 3750	\$35,000 - 44,999
\$939 - 1146	\$3751 - 4583	\$45,000 - 54,999
\$1147 - 1354	\$4584 - 5417	\$55,000 - 64,999
\$1355 - 1563	\$5418 - 6250	\$65,000 - 74,999
\$1564 - 1771	\$6251 - 7083	\$75,000 - 84,999
\$1772 - 1979	\$7084 - 7917	\$85,000 - 94,999
\$1980 or more	\$7918 or more	\$95,000 or more

Appendix D: Infant PTSD Interview

(0 = not present 1 = sometimes or somewhat present 2 = present)

A.		Alternative Criteria
1	The individual has experienced an event that was traumatic.	0 2
B.	Now I'd like to ask you how your child reacted after the event. For example...	
2a	...did your child reenact some part of the traumatic event? (Distinguish between play reenactments and the compulsive, repetitive, and more literal and less imaginative posttraumatic play.)	0 1 2
	When did this start? How often did you see this? How long did it last?	
b	...has your child made repeated statements or questions about the event? Would you say that he was preoccupied with the event? Did he appear distressed by these?	0 1 2
	When did this start? How often did you see this? How long did it last?	
c	...has your child had nightmares about it? (Frightening dreams with no recognizable content is sufficient to meet criteria)	0 1 2
	When did this start? How often did you see this? How long did it last?	
d	...has your child gotten biologically worked up because of a reminder of the event, such as having a fast heart rate, looking shaky, sweaty, or breathing really fast? (verbal children may report these or other somatic symptoms such as stomachaches, chest tightness or shortness of breath)	0 1 2
	When did this start? How often did you see this? How long did it last?	
e	...did your child appear to have flashbacks, that is for a minute or so acting like the event was happening all over again? Or, appear to space out as if in a daze? (also staring or freezing).	0 1 2
	When did this start? How often did you see this?	

PTSD in Infancy and Early Childhood

	How long did it last?	
C. Since the Event....		
3a	...has your child been more withdrawn and less sociable than before?	0 1 2
	When did this start? How often did you see this? How long did it last?	
b	...has your child shown less emotion than usual?	0 1 2
	When did this start? How often did you see this? How long did it last?	
c	...does your child play less than before? Or show less interest in playing with other children or family members?	0 1 2
	When did this start? How often did you see this? How long did it last?	
d (1)	... or tried to avoid places, persons, or things connected to the event?	0 1 2
	When did this start? How often did you see this? How long did it last?	
d (2)	... has your child tried to avoid hearing conversations about the event?	0 1 2
	When did this start? How often did you see this? How long did it last?	
D. Since the trauma...		
4a	...has your child had a hard time going to bed, falling asleep, or waking during the night (which is unrelated to nightmares)?	0 1 2
	When did this start? How often did you see this? How long did it last?	
b	...has your child had more difficulty concentrating on things than he use to?	0 1 2
	When did this start? How often did you see this?	

	How long did it last?	
c	...has your child seemed watchful or on guard even when there was no reason to be?	0 1 2
	When did this start? How often did you see this? How long did it last?	
d	...were there times when your child got scared or very upset when he heard a sudden noise, or if someone came up from behind him when he didn't know they were coming? Seems to startle more easily than other children?	0 1 2
	When did this start? How often did you see this? How long did it last?	
e	...has your child shown increased irritability, fussiness, extreme mood swings, or temper tantrums?	0 1 2
	When did this start? How often did you see this? How long did it last?	

Associated Symptoms:

5a	...did your child lose some skills that he had learned before? Did he lose toileting skills, become mute, or lose some speech skills?	0 1 2
	When did this start? How often did you see this? How long did it last?	
b	...has your child become afraid of things he didn't used to be afraid of? Such as fear of toileting alone, of the dark, of strangers, or other things?	0 1 2
	When did this start? How often did you see this? How long did it last?	
c	...has your child been upset when he had to be separated from his mother a lot more than he use to be?	0 1 2
	When did this start? How often did you see this?	

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	How long did it last?	
d	...has your child been a lot more aggressive than he use to be?	0 1 2
	When did this start? How often did you see this? How long did it last?	
e	Has your child been bothered by most of these things for as long as a month?	0 1 2

Appendix E: Attachment Q-Sort Items

The following is a list of behaviours that may or may not describe your child. The purpose of reading through this list is to help you get familiar with these behaviours. Over the next few days we will want you to think about the behaviours on this list while you are with your child. We will then ask you to describe your child using these behaviours.

1. Child readily shares with mother or lets her hold things if she asks to.
2. When child returns to mother after playing, he is sometimes fussy for no clear reason.
3. When he is upset or injured, child will accept comforting from adults other than mother.
4. Child is careful and gentle with toys and pets.
5. Child is more interested in people than in things.
6. When child is near mother and sees something he wants to play with, he fusses or tries to drag mother over to it.
7. Child laughs and smiles easily with a lot of different people.
8. When child cries, he cries hard.
9. Child is lighthearted and playful most of the time.
10. Child often cries or resists when mother takes him to bed for naps or at night.
11. Child often hugs or cuddles against mother, without her asking or inviting him to do so.
12. Child quickly gets used to people or things that initially made him shy or frightened him.
13. When the child is upset by mother's leaving, he continues to cry or even gets angry after she is gone.
14. When child finds something new to play with, he carries it to mother or shows it to her from across the room.
15. Child is willing to talk to new people, show them toys, or show them what he can do, if mother asks him to.
16. Child prefers toys that are modeled after living things (e.g., dolls, stuffed animals).
17. Child quickly loses interest in new adults if they do anything that annoys him.
18. Child follows mother's suggestions readily, even when they are clearly suggestions rather than orders.
19. When mother tells child to bring or give her something, he obeys.
20. Child ignores most bumps, falls, or startles.
21. Child keeps track of mother's location when he plays around the house.
22. Child acts like an affectionate parent toward dolls, pets, or infants.
23. When mother sits with other family members, or is affectionate with them, child tries to get mom's affection for himself.
24. When mother speaks firmly or raises her voice at him, child becomes upset, sorry, or ashamed about displeasing her.
25. Child is easy for mother to lose track of when he is playing out of her sight.
26. Child cries when mother leaves him at home with babysitter, father, or grandparent.
27. Child laughs when mother teases him.
28. Child enjoys relaxing in mother's lap.
29. At times, child attends so deeply to something that he doesn't seem to hear when people speak to him.
30. Child easily becomes angry with toys.

31. Child wants to be the center of mother's attention. If mom is busy or talking to someone, he interrupts.
32. When mother says "No" or punishes him, child stops misbehaving (at least at that time). Doesn't have to be told twice.
33. Child sometimes signals mother (or gives the impression) that he wants to be put down, and then fusses or wants to be picked right back up.
34. When child is upset about mother leaving him, he sits right where he is and cries. Doesn't go after her.
35. Child is independent with mother. Prefers to play on his own; leaves mother easily when he wants to play.
36. Child clearly shows a pattern of using mother as a base from which to explore. Moves out to play; Returns or plays near her; moves out to play again, etc.
37. Child is very active. Always moving around. Prefers active games to quiet ones.
38. Child is demanding and impatient with mother. Fussing and persists unless she does what he wants right away.
39. Child is often serious and businesslike when playing away from mother or alone with his toys.
40. Child examines new objects or toys in great detail. Tries to use them in different ways or to take them apart.
41. When mother says to follow her, child does so.
42. Child recognizes when mother is upset. Becomes quiet or upset himself. Tries to comfort her. Asks what is wrong, etc.
43. Child stays closer to mother or returns to her more often than the simple task of keeping track of her requires.
44. Child asks for and enjoys having mother hold, hug, and cuddle him.
45. Child enjoys dancing or singing along with music.
46. Child walks and runs around without bumping, dropping, or stumbling.
47. Child will accept and enjoy loud sounds or being bounced around in play, if mother smiles and shows that it is supposed to be fun.
48. Child readily lets new adults hold or share things he has, if they ask to.
49. Runs to mother with a shy smile when new people visit the home.
50. Child's initial reaction when people visit the home is to ignore or avoid them, even if he eventually warms up to them.
51. Child enjoys climbing all over visitors when he plays with them
52. Child has trouble handling small objects or putting small things together.
53. Child puts his arms around mother or puts his hand on her shoulder when she picks him up.
54. Child acts like he expects mother to interfere with his activities when she is simply trying to help him with something.
55. Child copies a number of behaviors or way of doing things from watching mother's behavior.
56. Child becomes shy or loses interest when an activity looks like it might be difficult.
57. Child is fearless.
58. Child largely ignores adults who visit the home Finds his own activities more interesting.
59. When child finishes with an activity or toy, he generally finds something else to do without returning to mother between activities.

60. If mother reassures him by saying "It's OK" or "It won't hurt you", child will approach or play with things that initially made him cautious or afraid.
61. Plays roughly with mother. Bumps, scratches, or bites during active play. (Does not necessarily mean to hurt mom)
62. When child is in a happy mood, he is likely to stay that way all day.
63. Even before trying things himself, child tries to get someone to help him.
64. Child enjoys climbing all over mother when they play.
65. Child is easily upset when mother makes him change from one activity to another.
66. Child easily grows fond of adults who visit his home and are friendly to him.
67. When the family has visitors, child wants them to pay a lot of attention to him.
68. On the average, child is a more active type person than mother.
69. Rarely asks mother for help. Middle if child is too young to ask.
70. Child quickly greets his mother with a big smile when she enters the room. (Shows her a toy, gestures, or says "Hi, Mommy").
71. If held in mother's arms, child stops crying and quickly recovers after being frightened or upset.
72. If visitors laugh at or approve of something the child does, he repeats it again and again.
73. Child has a cuddly toy or security blanket that he carries around, takes it to bed, or holds when upset.
74. When mother doesn't do what child wants right away, child behaves as if mom were not going to do it at all.
75. At home, child gets upset or cries when mother walks out of the room. (May or may not follow her.)
76. When given a choice, child would rather play with toys than with adults.
77. When mother asks child to do something, he readily understands what she wants (May or may not obey.)
78. Child enjoys being hugged or held by people other than his parents and/or grandparents.
79. Child easily becomes angry at mother.
80. Child uses mother's facial expressions as good source of information when something looks risky or threatening.
81. Child cries as a way of getting mother to what he wants.
82. Child spends most of his play time with just a few favorite toys or activities.
83. When child is bored, he goes to mother looking for something to do.
84. Child makes at least some effort to be clean and tidy around the house.
85. Child is strongly attracted to new activities and new toys.
86. Child tries to get mother to imitate him, or quickly notices and enjoys it when mom imitates him on her own.
87. If mother laughs at or approves of something the child has done, he repeats again and again.
88. When something upsets the child, he stays where he is and cries.
89. Child's facial expressions are strong and clear when he is playing with something.
90. If mother moves very far, child follows along and continues his play in the area she has moved to. (Doesn't have to be called or carried along; doesn't stop play or get upset.)

Appendix F: Infant Characteristics Questionnaire

For the following questions please circle the number that is most typical of your child. “About average” means how you think the typical child would be scored.

Please remember to think of the child that was recently immunized.

21. How easy or difficult is it for you to calm or soothe your child when he/she is upset?

- 1 Very easy
- 2
- 3
- 4 About Average
- 5
- 6
- 7 Difficult

22. How consistent is your child in sticking to his/her sleeping routine?

- 1 Very consistent; little or no variability
- 2
- 3
- 4 Some variability
- 5
- 6
- 7 Very inconsistent; highly variable

23. How consistent is your child in sticking to his/her eating routine?

- 1 Very consistent; little or no variability
- 2
- 3
- 4 Some variability
- 5
- 6
- 7 Very inconsistent; highly variable

24. How easy or difficult is it for you to know what’s bothering your child when he/she cries or fusses?

- 1 Very easy
- 2
- 3
- 4 About average
- 5
- 6
- 7 Difficult

25. How many times per day, on the average, does your child get fussy and irritable – for either short or long periods of time?

- 1 Never
- 2 1 – 2 times per day
- 3 3 – 4 times per day
- 4 5 – 6 times per day
- 5 7 – 9 times per day
- 6 10 – 14 times per day
- 7 More than 15 times per day

26. How much does your child cry and fuss in general?

- 1 Very little; much less than the average child
- 2

- 3
- 4 Average amount; about as much as the average child
- 5
- 6
- 7 A lot; much more than the average child

27. How does your child typically respond to new playthings?

- 1 Always responds favourably
- 2
- 3
- 4 Responds favourably about half the time, or is always neutral
- 5
- 6
- 7 Always responds negatively or fearfully

28. How does your child typically respond to new foods?

- 1 Always responds favourably
- 2
- 3
- 4 Responds favourably about half the time, or is always neutral
- 5
- 6
- 7 Always responds negatively or fearfully

29. How does your child typically respond to a new person?

- 1 Always responds favourably
- 2
- 3
- 4 Responds favourably about half the time, or is always neutral
- 5
- 6
- 7 Always responds negatively or fearfully

30. How does your child typically respond to being in a new place?

- 1 Always responds favourably
- 2
- 3
- 4 Responds favourably about half the time, or is always neutral
- 5
- 6
- 7 Always responds negatively or fearfully

31. How well does your child adapt to new experiences (such as items 27-30) eventually?

- 1 Very well, always likes it eventually
- 2
- 3
- 4 Ends up liking it about half the time
- 5
- 6
- 7 Almost always dislikes it in the end

32. How easily does your child get upset?

- 1 Very hard to upset – even by things that upset most children
- 2
- 3
- 4 About average
- 5

- 6
7 Very easily upset by things that wouldn't bother most children

33. When your child gets upset, how vigorously or loudly does he/she cry and fuss?

- 1 Very mild intensity or loudness
2
3
4 Moderate intensity or loudness
5
6
7 Very loud or intense, really cuts loose

34. How does your child react when you are dressing him/her?

- 1 Very well – likes it
2
3
4 About average – doesn't mind it
5
6
7 Doesn't like it at all

35. How active is your child in general?

- 1 Very calm and quiet
2
3
4 Average
5
6
7 Very active and vigorous

36. How much does your child smile and make happy sounds?

- 1 A great deal, much more than most children
2
3
4 An average amount
5
6
7 Very little, much less than most children

37. What kind of mood is your child generally in?

- 1 Very happy and cheerful
2
3
4 Neither serious nor cheerful
5
6
7 Serious

38. How much does your child enjoy playing with you?

- 1 A great deal, really loves it
2
3
4 About average
5
6
7 Very little, doesn't like it very much

39. How much does your child want to be held?

- 1 Wants to be free most of the time
- 2
- 3
- 4 Sometimes wants to be held; sometimes not
- 5
- 6
- 7 A great deal – wants to be held almost all the time

40. How does your child respond to disruptions and changes in everyday routine, such as when you go to church or a meeting, on trips, etc.?

- 1 Very favourably, doesn't get upset
- 2
- 3
- 4 About average
- 5
- 6
- 7 Very unfavourably; gets quite upset

41. How changeable is your child's mood?

- 1 Changes seldom, and changes slowly when he/she does change
- 2
- 3
- 4 About average
- 5
- 6
- 7 Changes often and rapidly

42. How excited does your child become when people play with or talk to him/her?

- 1 Very excited
- 2
- 3
- 4 About average
- 5
- 6
- 7 Not at all

43. On the average, how much attention does your child require, other than for care giving (feeding, diaper changes, etc.)?

- 1 Very little – much less than the average baby
- 2
- 3
- 4 Average amount
- 5
- 6
- 7 A lot – much more than the average baby

44. When left alone, your child plays well by him/herself.

- 1 Almost always
- 2
- 3
- 4 Average amount
- 5
- 6
- 7 Almost never – won't play by self

45. How does your child react to being confined (as in a car seat, bedroom, crib, etc.)?

- 1 Very well – likes it
- 2
- 3
- 4 Minds a little or protests once in awhile
- 5
- 6
- 7 Doesn't like it at all

46. How much does your child cuddle and snuggle when held?

- 1 A great deal – almost every time
- 2
- 3
- 4 Average, sometimes does and sometimes does not
- 5
- 6
- 7 Very little; seldom cuddles

47. How easy or difficult is it to take your child places?

- 1 Easy; fun to take child with me
- 2
- 3
- 4 Okay; child may fuss but no real trouble
- 5
- 6
- 7 Difficult; child is usually disruptive

48. Does your child persist in playing with objects when he/she is told to leave them alone?

- 1 Rarely or never persists
- 2
- 3
- 4 Sometimes does and sometimes does not
- 5
- 6
- 7 Almost always persists

49. Does your child continue to go someplace even when told something like “stop,” “come here,” or “no-no”?

- 1 Rarely or never
- 2
- 3
- 4 Sometimes does and sometimes does not
- 5
- 6
- 7 Almost always

50. When removed from something he/she is interested in but should not be getting into, your child gets upset.

- 1 Never
- 2
- 3
- 4 Sometimes does and sometimes does not
- 5

- 6
- 7 Always gets very upset

51. How persistent is your child in trying to get your attention when you are busy?

- 1 Doesn't persist at all
- 2
- 3
- 4 Will try, but will only mildly persist
- 5
- 6
- 7 Very persistent – will do anything to get attention

52. Please rate the overall degree of difficulty your child would present the average mother.

- 1 Super easy
- 2
- 3
- 4 Ordinary, some problems
- 5
- 6
- 7 Highly difficult to deal with

Appendix G: Parenting Scale

The following items have to do with discipline situations involving your child, and responses that parents sometimes use. Each item is followed by response options ranging from 1 to 7. Please circle the number that indicates which one of the responses you more commonly use.

For example,

A. When my child wants ice cream,

- 1 I always give my child some.
- 2
- 3
- 4
- 5
- 6
- 7 I never give my child some.

If you “always” give your child ice cream, you would circle “1.” If you “never” give your child ice cream, you would circle “7.” If the chances of ice cream are about even (half the time you would and half the time you wouldn’t) you would circle “4.” The numbers in between are for “sometimes.”

Please circle one number for each item below, indicating how likely the responses are for you with your child. *Please remember to think about the child that was recently immunized.*

1. When I say my child can’t do something,

- 1 I let my child do it anyway.
- 2
- 3
- 4
- 5
- 6
- 7 I stick to what I said.

2. When my child has misbehaved and I am disciplining my child,

- 1 I never or rarely insult my child, say mean things, or call my child names.
- 2
- 3
- 4
- 5
- 6
- 7 I insult my child, say mean things, or call my child names most of the time.

3. When my child does something I don’t like,

- 1 I often let it go.
- 2
- 3
- 4
- 5
- 6
- 7 I do something about it every time it happens.

4. If my child talks back or complains when I handle a problem,

- 1 I give a talk about not complaining.
- 2
- 3
- 4
- 5
- 6
- 7 I ignore the complaining and stick to what I said.

5. When I give a fair threat or warning,

- 1 I always do what I said.
- 2
- 3
- 4
- 5
- 6
- 7 I often don’t carry it out.

6. If saying “no” doesn’t work,

- 1 I offer my child something nice so he/she will behave.
- 2
- 3
- 4
- 5
- 6
- 7 I take some other kind of action.

7. When my child misbehaves,

- 1 I threaten to do things that I know I won’t actually do.
- 2
- 3
- 4
- 5
- 6
- 7 I only threaten things that I am sure I can carry out.

8. When I’m upset or under stress,

- 1 I’m on my child’s back.
- 2
- 3
- 4
- 5
- 6
- 7 I am no more picky than usual.

9. When we're not at home,

- 1 I let my child get away with a lot more.
- 2
- 3
- 4
- 5
- 6
- 7 I handle my child the same way.

10. When my child misbehaves,

- 1 I handle it without getting upset.
- 2
- 3
- 4
- 5
- 6
- 7 I get so frustrated or angry that my child can see I'm upset.

11. When my child misbehaves,

- 1 I coax or beg my child to stop.
- 2
- 3
- 4
- 5
- 6
- 7 I firmly tell my child to stop.

12. When disciplining my child,

- 1 I spank, grab, slap, or hit my child most of the time.
- 2
- 3
- 4
- 5
- 6
- 7 I never or rarely spank, grab, slap, or hit my child.

13. When my child is out of sight,

- 1 I always have a good idea of what my child is doing.
- 2
- 3
- 4
- 5
- 6
- 7 I often don't know what my child is doing.

14. Following a situation that has required that I discipline my child,

- 1 Things get back to normal quickly.
- 2
- 3
- 4
- 5
- 6
- 7 I often hold a grudge.

15. When I am disciplining my child,

- 1 I usually get into a long argument with my child.
- 2
- 3
- 4
- 5
- 6
- 7 I don't get into an argument.

16. When I am disciplining my child,

- 1 I say a lot.
- 2
- 3
- 4
- 5
- 6
- 7 I say very little.

17. In general,

- 1 I set limits on what my child can do.
- 2
- 3
- 4
- 5
- 6
- 7 I let my child do whatever he or she wants.

18. When I am explaining to my child the reasons for disciplining him or her,

- 1 I keep my talks short and to the point.
- 2
- 3
- 4
- 5
- 6
- 7 I give my child a long lecture.

19. When my child has misbehaved and I am disciplining my child,

- 1 I almost always use bad language or curse.
- 2
- 3
- 4
- 5
- 6
- 7 I rarely use bad language.

20. When my child misbehaves,

- 1 I say "no" or take some other action.
- 2
- 3
- 4
- 5
- 6
- 7 I make my child tell me why he/she did it.

21. When I have had to handle a problem,

- 1 I tell my child I'm sorry about it.
- 2
- 3
- 4
- 5
- 6
- 7 I don't tell my child I'm sorry.

22. If saying no doesn't work right away,

- 1 I take some other kind of action.
- 2
- 3
- 4
- 5
- 6
- 7 I keep talking and try to get through to my child.

23. If my child gets upset,

- 1 I stick to what I said.
- 2
- 3
- 4
- 5
- 6
- 7 I back down and give in.

24. When my child is misbehaving,

- 1 I use only one reminder or warning.
- 2
- 3
- 4
- 5
- 6
- 7 I give my child several reminders or warnings.

25. When my child is misbehaving,

- 1 I do something right away.
- 2
- 3
- 4
- 5
- 6
- 7 I do something about it later.

26. When my child won't do what I ask,

- 1 I take some other action.
- 2
- 3
- 4
- 5
- 6
- 7 I often let it go or end up doing it myself.

27. When my child has been misbehaving,

- 1 Things build up and I do things I don't mean to.
- 2
- 3
- 4
- 5
- 6
- 7 Things don't get out of hand.

28. If my child misbehaves and then acts sorry,

- 1 I handle the problem like I usually would.
- 2
- 3
- 4
- 5
- 6
- 7 I let it go that time.

29. When my child misbehaves,

- 1 I speak to my child calmly.
- 2
- 3
- 4
- 5
- 6
- 7 I raise my voice or yell.

30. When my child is asking repeatedly for something,

- 1 I can't ignore my child's pestering.
- 2
- 3
- 4
- 5
- 6
- 7 I can ignore the pestering.

Appendix H: Infant Life Events Scale

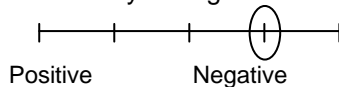
Below is a list of some experiences your child may have had in the past few years. For events your child has experienced, please indicate how old your child was at the time in years and months (or how old they were the last time it happened, if more than once). Also, please indicate your child's reaction right after the event based on your observation of their behaviour.

SAMPLE:

If, for example, your child became very upset and cried when he/she dropped their ice cream cone when he/she was 2 ½ years old, and overall you felt that it was a negative experience for your child, you would answer the question like this.

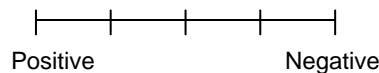
Dropped their favourite food (e.g., like an ice cream cone) Age: 2.5

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



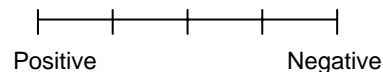
1. Started daycare or preschool Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



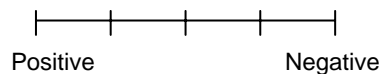
4. Had or has a best friend or playmate Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



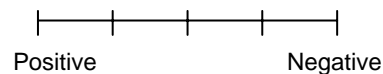
2. Went to an amusement park or exhibition Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



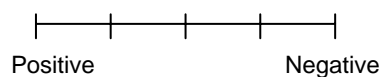
5. Experienced a house fire Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



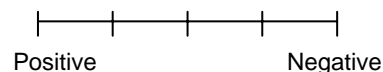
3. Has been separated from you overnight Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



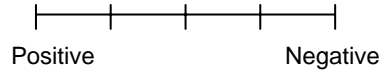
6. Pushed, hit or bit by another child Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



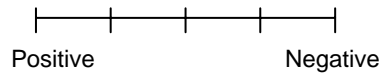
7. Experienced an illness Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



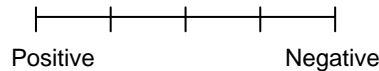
8. Was taken to a hospital emergency room

- Age: _____
- Unsure/don't know/NA
 - No reaction
 - Little reaction
 - Medium reaction
 - Strong reaction
 - Very strong reaction



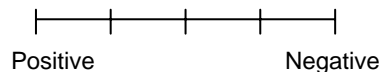
9. Participated in a regular group activity such as swimming lessons, gymnastics, indoor playground, music classes Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



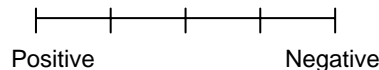
10. Was bitten by a dog or attacked by an animal

- Age: _____
- Unsure/don't know/NA
 - No reaction
 - Little reaction
 - Medium reaction
 - Strong reaction
 - Very strong reaction



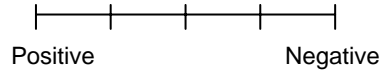
11. Moved to a new house or apartment Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



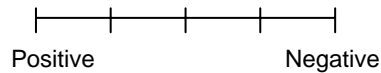
12. Moved from a crib to a 'big' bed Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



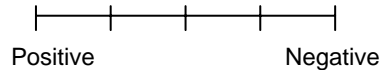
13. Experienced a major natural event such as a storm, tornado or flood Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



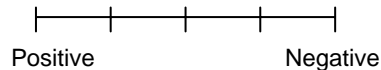
14. Involved in a car or boat accident Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



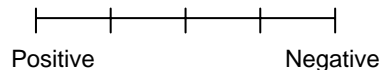
15. Learned to ride a tricycle Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



16. Experienced a painful medical procedure

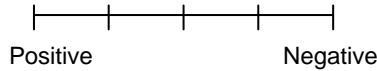
- Age: _____
- Unsure/don't know/NA
 - No reaction
 - Little reaction
 - Medium reaction
 - Strong reaction
 - Very strong reaction



17. Changed the place or room where they sleep

Age: _____

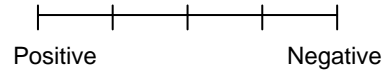
- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



22. Experienced an allergy or asthma attack

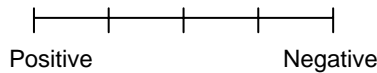
Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



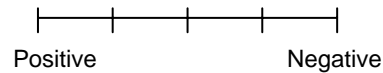
18. Was frightened by a very loud noise Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



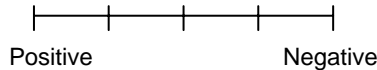
23. Had a major fall Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



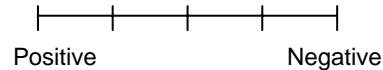
19. Was hospitalized Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



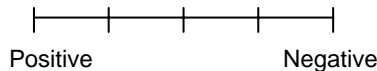
24. Had or has a pet Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



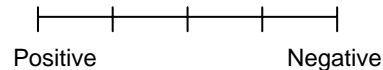
20. Experienced the birth of a sibling Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



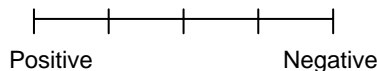
24. Experienced the death of a parent Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



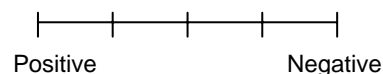
21. Experienced the death or major illness of an important person to them Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



25. Had/has an imaginary friend Age: _____

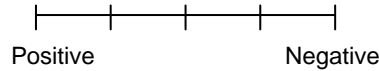
- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



25. Moved to a new group or room at daycare

Age: _____

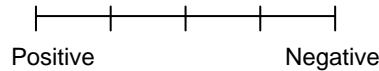
- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



26. Witnessed harm/violence/hurt to you or another important person in your child's life

Age: _____

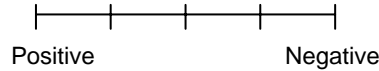
- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



27. Witnessed harm/violence/hurt to a stranger

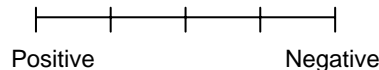
Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



28. Had an immunization Age: _____

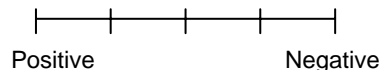
- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



29. Had a medical exam or dental procedure

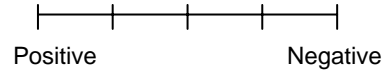
Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



30. Experienced a near drowning Age: _____

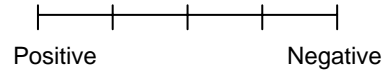
- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



31. Thought they were lost or left behind

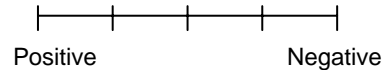
Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



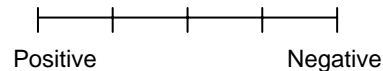
32. Attended a birthday party Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



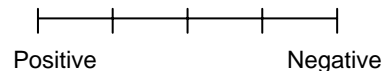
33. Attended a funeral Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



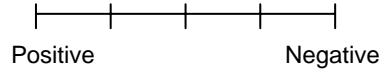
34. Went on a trip or vacation Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



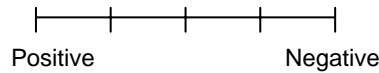
35. Received a burn Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



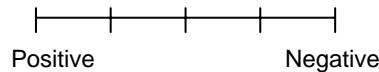
36. Involved in an accident with machinery

- Age: _____
- Unsure/don't know/NA
 - No reaction
 - Little reaction
 - Medium reaction
 - Strong reaction
 - Very strong reaction



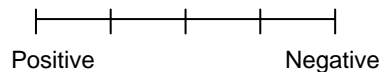
37. Had/has a close relationship with a grandparent Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



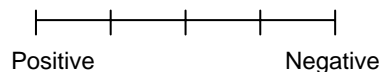
38. Went to live with someone else for at least one week Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



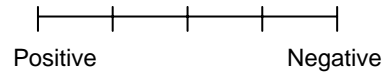
39. No longer sees mother or father on a daily basis because of a separation or divorce

- Age: _____
- Unsure/don't know/NA
 - No reaction
 - Little reaction
 - Medium reaction
 - Strong reaction
 - Very strong reaction



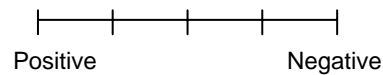
40. Saw a close family member get hurt or fall

- Age: _____
- Unsure/don't know/NA
 - No reaction
 - Little reaction
 - Medium reaction
 - Strong reaction
 - Very strong reaction



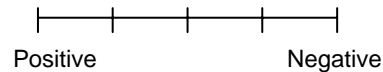
41. Was disciplined or punished for bad behaviour Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



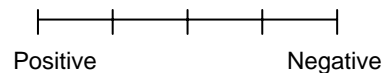
42. Had a daytime toileting accident Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



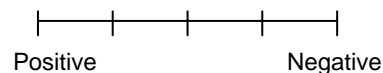
43. Wet the bed Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



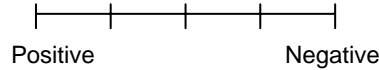
44. Lost a favourite toy or blanket or "special" object Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



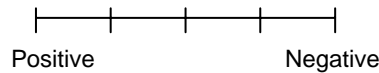
45. Choked on something Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



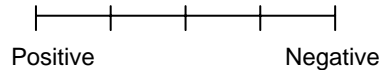
46. Your child was (or thought they were) locked in an enclosed space (e.g., like a closet or room) Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



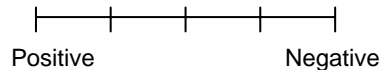
47. Saw a parade Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



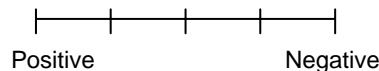
48. Stayed overnight at a crisis nursery or women's shelter Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



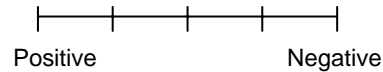
49. Attended a family reunion Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



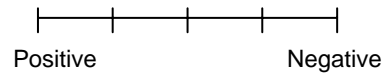
50. Witnessed an accident to a close friend or family member Age: _____

- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



51. Experienced abuse (emotional, physical or sexual) Age: _____

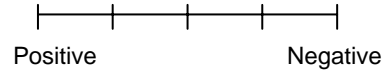
- Unsure/don't know/NA
- No reaction
- Little reaction
- Medium reaction
- Strong reaction
- Very strong reaction



52. Other important event(s) your child has experienced in the past three years:

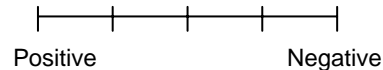
1. _____

- Age: _____
- Unsure/don't know/NA
 - No reaction
 - Little reaction
 - Medium reaction
 - Strong reaction
 - Very strong reaction



2. _____

- Age: _____
- Unsure/don't know/NA
 - No reaction
 - Little reaction
 - Medium reaction
 - Strong reaction
 - Very strong reaction



Appendix I: Saliva Sampling Instruction Sheet

Please take the saliva sample at **10AM**

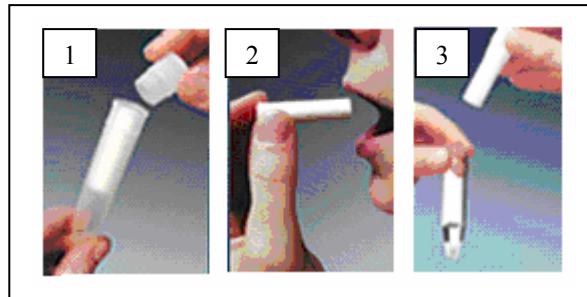
Please:

- DO NOT let your child eat 1 hour before taking the sample
- DO NOT let your child drink anything other than water 1 hour before taking the sample
- DO NOT allow your child to brush their teeth before taking the sample
- DO NOT allow your child to be very active 1 hour before taking the sample

Please read these instructions carefully before helping your child collect a saliva sample:

1. Open the lid of the plastic tube and take out the cotton swab
2. Ask your child to place the cotton in their mouth and chew on it for 20 seconds (or until they have made it wet with their saliva)
3. Ask your child to spit the cotton swab back into the plastic tube and put the lid back on.

The saliva sample can then be placed in the plastic bag and returned to us in the self addressed envelope. If you have any difficulties, please do not hesitate to call at 966-2323.



PLEASE INDICATE:

Date of saliva sample	_ / _ / _ (dd/mm/yy)	
Time of saliva sample	_ : _ pm or am	
Did anything particularly stressful or exciting happen today, or in the past few days, that was not a normally occurring event for your child? If so, please provide some details:		