CHILDHOOD ABUSE AND HEALTH ANXIETY:
THE ROLES OF ATTACHMENT AND EMOTION REGULATION

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Sarah Jane Reiser, candidate for the degree of Master of Arts in Clinical Psychology, has presented a thesis titled, *Childhood Abuse and Health Anxiety: The Roles of Attachment and Emotion Regulation*, in an oral examination held on June 25, 2013. The following committee members have found the thesis acceptable in form and content, and that the candidate demonstrated satisfactory knowledge of the subject material.

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Abstract

Health anxiety refers to excessive preoccupation or worry about one’s health. A number of childhood experiences have been linked to the development of health anxiety in adulthood; however, the influence of childhood abuse on health anxiety is unclear. Previous literature has revealed mixed findings (e.g., Noyes et al., 2002; Salmon & Calderbank, 1996). The purpose of the current study was to examine levels of health anxiety in adults who have a history of childhood abuse (i.e., physical, sexual, emotional, and neglect) and to investigate the roles of emotion regulation and attachment in this relationship. It was hypothesized that there would be significant, positive relationships between health anxiety, childhood abuse, and the associated constructs, that childhood abuse experiences and the associated constructs would be predictive of health anxiety, and that emotion regulation and attachment would mediate the relationship between childhood abuse and health anxiety. The sample was comprised of 181 University of Regina students ranging from 18 to 29 years of age ($M_{age} = 20.29$ years). Participants completed a battery of measures that assessed health anxiety, childhood abuse experiences, emotion regulation, attachment, and associated constructs. The results revealed that health anxiety was associated with all categories of childhood abuse and overall childhood abuse severity. Hierarchical multiple regression analysis indicated that childhood abuse was predictive of health anxiety in adulthood; however, the unique contribution of these experiences was no longer significant following the inclusion of the other variables of interest. Results from mediation analyses demonstrated that emotion dysregulation, attachment anxiety, and anxiety sensitivity were all revealed as partial mediators in the relationship between childhood abuse and health anxiety. These
findings contribute to a better understanding of the relationship between abuse in childhood and health anxiety in adulthood. Further, these findings may assist in identifying those at risk for developing health anxiety and may also have implications for strategies that may be useful in the prevention and treatment of health anxiety.
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1.0 Introduction

Severe health anxiety is among the most prevalent of the mental health disorders; approximately 5% of the general population experiences this distressing and disabling condition (Asmundson, Taylor, & Cox, 2001). The literature suggests that subclinical levels of health anxiety are even more prevalent in the general population ranging from 6% (Looper & Kirmayer, 2001) to 10% (Rief, Hessel, & Braehler, 2001) in community samples. It is generally believed that experiences during childhood may represent risk factors for the development of health anxiety later in life (e.g., Noyes et al., 2002). For example, personal illness or illness of a family member during childhood have been identified as possible risk factors associated with the onset of severe health anxiety (e.g., Barsky & Klerman, 1983; Kellner, 1986; Warwick & Salkovskis, 1990). Most salient to the present investigation are findings that suggest that a history of childhood abuse may be associated with later development of health anxiety (e.g., Barsky, Wool, Barnett, & Cleary, 1994); however, empirical research exploring this relationship is limited. The few studies that do examine this relationship reveal mixed findings on the potential associations (i.e., Barsky et al., 1994; Noyes et al., 2002; Salmon & Calderbank, 1996). Furthermore, these studies focus solely on physical and sexual forms of childhood abuse and exclude the examination of emotional abuse and neglect. Additional examination of the role of childhood abuse, including emotional abuse and neglect, is necessary for a more comprehensive understanding of the factors that are associated with elevated health anxiety.

If childhood abuse experiences are associated with health anxiety in adulthood, it is imperative to further explore the possible factors that may contribute to this
relationship. Salmon and Calderbank (1996) suggested that there must be different factors that mediate the associations of childhood abuse and illness beliefs and behaviours; however, these factors remain unclear. The current investigation aimed to clarify this relationship by examining the potential mediating roles of emotion regulation and attachment orientation.

One possible factor that may mediate the aforementioned relationship is emotion regulation. Emotion regulation has been identified as playing a role in the development and maintenance of psychological conditions, including anxiety disorders (e.g., Amstadter, 2008; Mennin, Heimberg, Turk, & Fresco, 2005; Orgeta, 2011). More specifically, recent research has examined the mediating role of emotion regulation in the relationship between childhood abuse history and generalized anxiety in adulthood; the results support the mediating role of emotion regulation in this relationship (Soenke, Hahn, Tull, & Gratz, 2010). These findings, and the broader literature on the association between emotion regulation and anxiety, provide a foundation from which a specific investigation of emotion regulation and health anxiety can be built.

A growing body of research also supports the relationship between childhood maltreatment and insecure attachment styles (e.g., Toth & Cicchetti, 1996; Stalker & Davies, 1995; Styron & Janoff-Bulman, 1997) as well as a relationship between insecure attachment and health anxiety (Ciechanowski, Walker, Katon, & Russo, 2002; Wearden, Perryman, & Ward, 2006). Accordingly, if childhood maltreatment is associated with insecure attachment, and insecure attachment is associated with health anxiety, it is plausible that insecure attachment plays a role in the path from childhood maltreatment to health anxiety. Furthermore, in related research on childhood abuse and adult
somatization (persistent experiences of somatic symptoms), one study provides support for the mediating role of attachment orientation in this relationship (Waldinger, Schulz, Barsky, & Ahern, 2006). The current investigation provides the first exploration of the mediating role of attachment in the relationship between childhood abuse and health anxiety in adulthood.

The following literature review includes an overview of the construct of health anxiety and the possible contributing factors in the development of this condition. The relationships of emotion regulation and attachment to both childhood abuse and health anxiety are discussed. The limited studies that have investigated the association between abuse and health anxiety are reviewed to provide relevant context for the current investigation.

1.1 What is Health Anxiety?

Health anxiety refers to excessive preoccupation or worry about one’s health. These worries arise from misinterpretations that bodily sensations are indicative of a serious medical condition, and these worries persist despite appropriate medical reassurance that one is physically healthy (Lucock & Morley, 1996; Warwick, 1989). The experience of health anxiety varies from person to person, and can be understood as a dimensional construct on a continuum from mild to severe (Ferguson, 2009). It is typical for people to experience mild forms of health anxiety; concern regarding bodily symptoms may be adaptive and facilitate the early detection of a medical condition (Asmundson et al., 2001). However, continuous and unwarranted health related worries are distressing and maladaptive. On the extreme end of this continuum, severe health anxiety is often referred to as hypochondriasis, a condition that is excessive, disabling,
and interferes with a person’s everyday functioning. The terms severe health anxiety and hypochondriasis are often used interchangeably, however, an important difference is that a diagnosis of hypochondriasis is categorical, while health anxiety is understood as a dimensional construct (Rachman, 2012). In the Diagnostic and Statistical Manual of Mental Disorders, Fourth edition, Text Revision (DSM-IV-TR; APA, 2000) hypochondriasis was classified as a somatoform disorder, although there was debate as to whether the disorder would be more appropriately classified as an anxiety disorder, due to the considerable symptom overlap and high comorbidity rates between hypochondriasis and other anxiety disorders (e.g., Deacon & Abramowitz, 2008; Noyes, 1999; Taylor & Asmundson, 2004). A number of recommendations had been made for the re-categorization of hypochondriasis including a new classification of health anxiety disorder, as an obsessive-compulsive spectrum disorder, or as complex somatic symptom disorder (a new somatoform disorder; Collimore, Asmundson, Taylor, & Abramowitz, 2009). The recent release of the Diagnostic and Statistical Manual of Mental Disorders, Fifth edition (DSM-5) revealed a number of noteworthy classification changes. In the DSM-5, somatoform disorders are now referred to as somatic symptom and related disorders and hypochondriasis has been eliminated as a disorder (APA, 2013). The majority of individuals that would have previously been diagnosed with hypochondriasis would now receive the DSM-5 diagnosis of somatic symptom disorder - a diagnosis for those with significant somatic symptoms and health anxiety (APA, 2013). Individuals with high health anxiety without somatic symptoms would now receive a diagnosis of illness anxiety disorder, a new addition to the DSM-5 (APA, 2013).
1.1.1 Comorbidity. Health anxiety and hypochondriasis are associated with a number of other mental health conditions. Individuals with severe health anxiety commonly present with coexisting anxiety disorders, depression, and other somatoform disorders (APA, 2000). For some individuals severe health anxiety appears to be an independent condition; however, a study involving 50 patients (mean age = 39.6 years) with severe health anxiety found that overall comorbidity with any other psychiatric disorder was 62%, compared with 30% in control patients (Noyes et al., 1994). Another study examined psychiatric comorbidity in patients from a general medical clinic (mean age = 57.1 years) and found that 88% of individuals with severe health anxiety (n = 42) had more than one Axis I disorder compared to 51% in the control group (n = 76; Barsky, Wyshak, & Klerman, 1992). Moreover, individuals with other psychological disorders as a primary diagnosis often present with severe health anxiety as a secondary condition. For example, Bach, Nutzinger, and Hartl (1996) found that 50% of individuals (N = 82, 21 to 68 years of age) diagnosed with a DSM-III-R anxiety disorder also showed signs of severe health anxiety. There are also a number of associated conditions characterized by similar symptomatology as health anxiety, including generalized anxiety disorder (GAD), depression, obsessive-compulsive disorder, panic disorder, and specific (disease) phobia (Noyes, 2001).

1.1.2 Prevalence. Estimated prevalence rates of severe health anxiety vary extensively depending on the setting and on the diagnostic criteria being utilized. In primary care and general medical settings prevalence estimates range from as low as 0.8% (Gureje, Ustun, & Simon, 1997) to as high as 8.5% (Noyes et al., 1993). In a systematic review of studies examining the prevalence of hypochondriasis, Creed and
Barsky (2004) found that the median prevalence of hypochondriasis in primary care samples was 4.2%. Overall, severe health anxiety is among the most prevalent of the psychological disorders and upon reviewing the previous research in this area, it is estimated that it occurs in approximately 5% of the general population (Asmundson et al., 2001).

Subclinical, yet significant, health-focused anxiety appears to be even more prevalent in the general population. Looper and Kirmayer (2001) surveyed a community sample ($N = 533$, mean age = 46 years) and found that 6% of the sample had elevated health anxiety. Moreover, health anxiety was revealed as a predictor of somatic symptoms, help-seeking behaviours, and disability when demographic and medical variables were controlled. Another study examined health anxiety in the general population ($N = 2050$, 14 to 92 years of age) and found that 10% of the sample reported elevated health anxiety or the conviction of having a serious illness, despite a lack of a medical explanation for the concerns (Rief et al., 2001). Considering the aforementioned findings, elevated levels of health anxiety appear to be a relatively common experience in the general population.

1.1.3 Onset and course. Severe health anxiety can develop at any age, although it is thought that the most common age of onset is in early adulthood (APA, 2000). Little is known about the course of health anxiety (Asmundson et al., 2001). It is common for people to experience minor, temporary bouts of anxiety related to their health (Asmundson et al., 2001); however, some individuals experience persistent health anxiety that negatively impacts personal functioning and can also influence interactions with the health care system. Previous literature suggests that health anxiety could be
associated with stress and life crises (e.g., Barsky & Klerman, 1983), the occurrence of a personal illness or a misdiagnosis (e.g., Warwick & Salkovskis, 1990), or illness among relatives (e.g., Kellner, 1986). Sandin, Chorot, Santed, and Valiente (2004) found that health-related life events (i.e., personal physical illness or the physical illness of a close friend or relative) was the category of adverse experiences that most consistently related to the onset of severe health anxiety. Health anxiety can also develop following exposure to illness-related media information (Martin, Lemos, & Levanthal, 2001). Elevated levels of health anxiety have been found in individuals with a range of medical conditions (Looper & Kirmayer, 2001) including multiple sclerosis (Kehler & Hadjistavropoulos, 2009), chronic pain (Hadjistavropoulos, Owens, Hadjistavropoulos, & Asmundson, 2001), and breast cancer (Grassi, Rossi, Sabato, Cruciani, & Zembelli, 2004). Individuals with hypochondriasis have not been found to have more medical illness compared to those without hypochondriasis (e.g., Barsky, Wyshak, Latham, & Klerman, 1991); therefore, while individuals with a physical illness may experience increased health anxiety, severe health anxiety does not appear to be influenced by medical morbidity. In addition, individuals with health anxiety tend to be older and have less education (e.g., Noyes, Happel, & Yagla, 1999). Predisposing factors that underlie health anxiety may include elevated levels of anxiety sensitivity, neuroticism, and depression (McClure & Lilienfeld, 2001; Williams, 2004).

From a cognitive-behavioural perspective, it is thought that an individual’s health-related cognitions are critical in the development and maintenance of health anxiety. Salkovskis and Warwick’s (2001) cognitive-behavioural model of health anxiety proposes that negative misinterpretation of bodily symptoms and other health-
related information is the primary mechanism underlying health anxiety and that maladaptive core beliefs (regarding health and illness) play a major role in the development of health anxiety. Similarly, a recent review by Rachman (2012) emphasized the role of cognitions in health anxiety and posits that health anxiety is caused by the misinterpretations of changes in bodily sensations, functions, and appearance as indications of a serious or fatal illness. Unwanted, intrusive images can also provoke concern and contribute to health anxiety; these images are typically future-oriented and have main themes of serious illness or death (Muse, McManus, Hackmann, Williams, & Williams, 2010; Wells & Hackmann, 1993).

A number of cognitions are also thought to contribute to the maintenance of health anxiety including enhanced attention to threats (especially health-related threats), an accumulation of threatening memories, and cognitive biases (Rachman, 2012). Individuals with health anxiety often engage in safety behaviours (i.e., avoidance, checking, information seeking, and reassurance seeking) in an effort to reduce their anxiety (Rachman, 2012). Contrary to their intended purpose, these behaviours are not helpful – they can reinforce maladaptive behaviours and are partly responsible for the maintenance of health anxiety (Rachman, Radomsky, & Shafran, 2008).

Due to the nature of severe health anxiety, people with this condition often utilize health care resources in ways that are maladaptive and expensive for the health care systems (Barsky, Ettner, Horsky, & Bates, 2001). Frequent, and often unnecessary, visits to a physician, physical examinations, diagnostic testing, and “doctor shopping” are commonly displayed; these repeated procedures are costly and carry their own risks (APA, 2000). Consistent with a large body of research, Barsky and colleagues (2001)
found that primary care patients (18 to over 65 years of age) who had high levels of health anxiety \((n = 212)\) had more frequent medical appointments at higher costs compared to those without elevated health anxiety \((n = 664)\). It is advantageous to the health care system, patients, and health care providers if health anxiety is detected early in an effort to prevent unwarranted use of health care resources, so that, alternatively, patients can be referred to psychological services for assessment and intervention.

1.1.4 Childhood precipitants. As previously noted, past experiences of serious illness, the illness or death of a loved one, and other psychosocial stressors have been found to be associated with the occurrence of severe health anxiety (APA, 2000). Furthermore, it is generally believed that experiences in childhood can predispose a person to the development of health anxiety later in life (Noyes, et al., 2002). Childhood experiences, such as having a chronic or serious illness or the illness of a loved one, have been identified as possible contributing factors to the development of severe health anxiety (APA, 2000). Noyes and colleagues (2002) examined childhood antecedents of hypochondriacal symptomatology in adult patients attending a general medical clinic \((N = 162, \text{mean age} = 51 \text{ years})\). The findings indicated that poor health, health-focused worries, and separation anxiety in childhood were associated with hypochondriacal symptoms in adulthood. In addition, the role of childhood abuse in the development of health anxiety has, to some extent, been examined as a possible antecedent to this condition (e.g., Barsky et al., 1994). Related research in the areas of abuse and, more specifically, childhood abuse will be reviewed below.
1.2 Childhood Abuse

The term *childhood abuse* (also referred to as *childhood maltreatment*) refers to the mistreatment, violence, or neglect that a child or adolescent may experience while in the care of an individual the child depends on or trusts (Department of Justice Canada, 2001). Research findings from high-income countries estimate that 4-16% of children experience physical abuse, 10% of children experience psychological abuse and neglect, and that 15-30% of girls and 5-15% of boys experience sexual abuse in childhood (Gilbert et al., 2009). The Canadian Incidence Study of Reported Child Abuse and Neglect (CIS; Trocmé et al., 2005), a national child maltreatment study, provided an estimate of the number of cases of alleged child abuse (i.e., physical abuse, sexual abuse, emotional maltreatment, neglect, and exposure to domestic violence) in children under the age of 16 and investigated by Canadian child welfare services in 2003. The CIS estimated that a total of 235,315 child abuse investigations took place in Canada during that year. Due to the nature of these conditions (e.g., children often do not, or cannot, disclose the maltreatment, or the abuse is not reported to the authorities) it is difficult to obtain an accurate depiction of the incidence and prevalence rates of childhood abuse in Canada or globally; the incidence of child abuse is likely to be extremely underreported.

In recent decades one specific research direction has focused on the neurobiological consequences of childhood abuse experiences. Neurobiological research has contributed to a better understanding of the long-term consequences of childhood maltreatment, and supports the relationship between childhood abuse and the development of psychopathology. This research has revealed that early adverse experiences (including extreme stress) influence the development of the brain (Perry,
Pollard, Blakely, Baker, & Vigilante, 1995; Streeck-Fischer & van der Kolk, 2000). Specifically, a strong association has been found between experiences of childhood abuse and changes in brain organization, function, and structure (Coates, 2010). Research suggests that childhood abuse and neglect impacts a number of systems and regions in the developing brain including the hypothalamic-pituitary-adrenocortical (HPA) axis (Neigh, Gillespie, & Nemeroff, 2009), limbic system (Teicher, et al., 2003; Teicher, Glod, Surrey, & Swett, 1993), corpus callosum (De Bellis et al., 1999), and cerebral cortex (Arnsten, 1999). Childhood is noted as the most vulnerable period to the neurobiological effects of trauma (Perry et al., 1995) and the impacts of childhood abuse can continue into adulthood (Draper et al., 2008). In particular, these neurobiological changes can severely impact the way the brain copes with stress in adulthood (McGowan et al., 2009) and play a significant role in the development of psychological disorders in later childhood and adulthood (Post, Weiss, & Leverich, 1994; Teicher, 2002; Teicher et al., 2003). The neurobiological impact of childhood abuse is an important area of current research, albeit outside the scope of the current study.

Research concerning childhood abuse experiences has traditionally focused solely on physical and sexual forms of maltreatment. Empirical research examining childhood emotional abuse (also referred to as psychological abuse) and neglect is relatively limited compared to childhood physical and sexual abuse (Barnett, Miller-Perrin, & Perrin, 2005). This may be due, in part, to the definitional and measurement difficulties that accompany examining these particular forms of abuse (Glaser, 2002; McGee & Wolfe, 1991; Shaver, Goodman, Rosenberg, & Orcutt, 1991). Generally, emotional abuse and neglect can be defined as a relationship between caregiver and child
that is characterized by patterns of harmful interactions for the child that contain no physical contact (Glaser, 2002). More specifically, it is difficult to determine the threshold for what should be considered psychologically abusive behavior. Despite the definitional and measurement issues inherent in examining emotional abuse in childhood, recent research, albeit limited, supports the view that emotional maltreatment may be among the most prevalent and damaging forms of childhood abuse (e.g., Barnett et al., 2005).

Emotional abuse often co-occurs with physical and sexual abuse (Claussen & Crittenden, 1991; Higgins & McCabe, 2001). Previous research indicates that the combination of multiple forms of childhood abuse, including emotional abuse and neglect, is associated with an increased risk for adverse mental and physical health consequences later in life (e.g., Chapman et al., 2004; Dube et al., 2001; Felitti et al., 1998). However, research suggests that childhood emotional abuse, independently, can have a significant impact on functioning in adulthood (e.g., Ferguson & Dacey, 1997; Spertus, Yehuda, Wong, Halligan, & Seremetis, 2003). Emotional abuse and neglect are pervasive and serious issues that merit further examination; thus, these forms of maltreatment, along with childhood physical and sexual abuse, were included in the current investigation.

Childhood maltreatment, especially physical and sexual forms, and the development of adult psychopathology has been the topic of extensive investigation. A wide body of research supports a significant relationship between abuse in childhood and the development of mental health conditions in adulthood, including depression (e.g., Chapman et al., 2004) and anxiety disorders (e.g., MacMillan et al., 2001; Mancini, Van
Ameringen, & MacMillan, 1995), especially post traumatic stress disorder (e.g., Gibb, Chelminski, & Zimmerman, 2007). Previous research has also identified an association between childhood maltreatment and the development of somatoform disorders (e.g., Haugaard, 2004). Related to somatoform disorders, a number of studies emphasize a relationship between childhood abuse experiences and the expression of somatic symptoms (medically unexplained physical symptoms) in childhood and adulthood (e.g., Garralda, 1996). The research in this area will be reviewed briefly below.

1.2.1 Childhood abuse and somatic symptoms. A number of research studies have emphasized a relationship between somatic symptoms and childhood abuse experiences. For example, Sansone, Wiederman, and Sansone (2001) found that a history of childhood trauma (i.e., abuse or witnessing violence) had a direct effect on somatic preoccupations in adults ($n = 120$, 19 to 54 years of age) who were seeking services at an outpatient medical clinic; these findings suggest that childhood traumatic experiences may be a precursor for somatic symptoms in adulthood. Severe forms of childhood sexual abuse have also been linked to higher rates of somatic symptoms (e.g., Garralda, 1996). A recent review of the literature regarding childhood maltreatment and somatoform disorders in childhood suggests that children who have been the victims of abuse may be more likely to persist in expressing emotions through physical symptoms because of their history of pairing emotional trauma with physical pain (Haugaard, 2004). The aforementioned findings are related to the topic of health anxiety, as there is often overlap between health-related worries and somatic preoccupation, and health anxiety can play a major role in expressing somatic symptoms (Furer, Walker, & Stein, 2007).
1.2.2 Abuse history and health anxiety. While there are a number of studies examining the relationship between childhood abuse and somatic symptoms, anxiety, or depression there is a lack of information concerning abuse (and more specifically childhood abuse) and the development of health anxiety. Recently, Stein and colleagues (2004) examined the relationship between sexual assault (i.e., rape, attempted rape, or being forced or threatened to perform any sexual act) and levels of health anxiety in female patients at a Veteran’s Affairs clinic ($N = 219$). Nearly half of the participants in the study reported experiencing sexual assault ($n = 97$, mean age = 43 years). Their findings revealed a significant increase in levels of health anxiety in women who had a sexual assault history. This study is limited in that it does not report, or control for, the number of assaults experienced or the age at the time of the offense. This study provides support for a relationship between sexual assault and health anxiety; however, it does not clarify whether childhood sexual abuse produces the same negative consequences as sexual assault in adulthood. Additional research is necessary to determine whether childhood sexual abuse, like sexual assault in adulthood, is associated with elevated health anxiety.

1.2.2.1 Childhood abuse and health anxiety. The limited number of studies that have examined hypochondriasis in adults with a history of childhood abuse have yielded mixed results. For example, Noyes and colleagues (2002) found that patients with hypochondriasis ($n = 47$, mean age = 47.6 years) more often reported a history of adverse childhood experiences (e.g., an extreme illness or injury) compared to patients without hypochondriasis ($n = 108$, mean age = 52.7 years); however, the percentages of patients reporting physical and sexual abuse did not significantly differ between the
groups. In contrast, Barsky and colleagues (1994) compared patients with hypochondriasis ($n = 60$, mean age = 46.6 years) to patients without hypochondriasis ($n = 60$, mean age = 55.0 years) and found that significantly more patients with hypochondriasis reported physical and sexual abuse in childhood. There were not significant between group differences in terms of medical morbidity. Although this study did control for sociodemographic variables (i.e., age, gender, socioeconomic status), it did not control for comorbid mental health issues. Furthermore, Salmon and Calderbank (1996) examined the relationship between childhood sexual and physical abuse and two components of health anxiety (i.e., disease concern and disease conviction), in undergraduate students ($N = 275$, 18 to 34 years of age). The findings revealed a relationship between both types of abuse and both of these components of health anxiety. The aforementioned findings provide conflicting results, suggesting that additional research is warranted to clarify the relationship between childhood abuse experiences and health anxiety in adulthood.

1.3 Associated Constructs

1.3.1 Anxiety and depression. Anxiety and depression have been linked to both childhood abuse experiences (e.g., Gibb et al., 2007; MacMillan et al., 2001; Mancini et al., 1995) and health anxiety in adulthood (e.g., Barsky et al., 1992). Therefore, these associated constructs appear important to consider when investigating childhood abuse histories and health anxiety. Moreover, it is important to consider depression and/or anxiety as possible explanations for, or comorbid presentations with, health anxiety in adulthood. Noyes and colleagues (1994) examined psychiatric comorbidities in individuals with severe health anxiety ($n = 50$, mean age = 39.6 years) and found that
major depression was the most frequent comorbid condition with 28% reporting current 
major depression, followed by panic disorder with agoraphobia, which was reported by 
16% of the individuals. Overall, 44% reported having a coexisting depressive disorder 
and 22% reported having a coexisting anxiety disorder. Their findings indicated that 
high levels of depressive and anxiety symptoms were experienced among those with 
severe health anxiety and that a high proportion of these individuals met criteria for 
depressive and anxiety disorders.

**1.3.2 Anxiety sensitivity.** Another construct that is associated with both negative 
childhood experiences (e.g., Scher & Stein, 2003) and adult health anxiety (e.g., 
Abramowitz, Olatunji, & Deacon, 2007; Stewart & Watt, 2000) is anxiety sensitivity. 
Anxiety sensitivity, first conceptualized by Reiss and McNally (1985), is a fearful 
response to anxiety symptoms based on the belief that they will have harmful 
consequences, including embarrassment, illness, or further anxiety. Anxiety sensitivity 
is distinct from, but associated with, anxiety (Silverman, Fleisig, Rabian, & Peterson, 
1991) and it has been suggested that anxiety sensitivity may play a role in a 
predisposition to the development of health anxiety (Watt, Stewart, & Cox, 1998). In a 
recent investigation, Wheaton, Berman, and Abramowitz (2010) found that anxiety 
sensitivity was associated with levels of health anxiety in an undergraduate student 
sample ($N = 636$, mean age $= 19.9$ years). Those in the high-health anxiety group 
reported greater levels of anxiety sensitivity relative to those in the low-health anxiety 
group and the *physical concerns* component of anxiety sensitivity was predictive of 
health anxiety. Furthermore, anxiety sensitivity has been found to mediate the 
relationship between childhood learning experiences and the development of health
anxiety among young adults (Watt & Stewart, 2000). Considering the aforementioned research, it may be important to consider the role of anxiety sensitivity when investigating childhood abuse and health anxiety in adulthood.

1.3.3 Emotion regulation. The term *emotion regulation*, sometimes referred to as *emotion management*, refers to one’s ability to effectively manage personal emotions; this occurs when responses to experiences include a range of emotions that are flexible and socially appropriate, as well as one’s ability to inhibit spontaneous reactions when necessary (Cole, Michel, & Teti, 1994). Emotion dysregulation refers to maladaptive ways of responding to personal emotions, including a lack of awareness and understanding of emotions, nonacceptance of emotions, difficulties controlling impulsive behaviours when experiencing negative emotions, and an inability to use emotion regulation strategies when appropriate (Gratz & Roemer, 2004). In recent decades research has focused on the role of emotion regulation in psychopathology and has emphasized the significance of emotion management in displaying normal and abnormal behaviour (Cicchetti, Ackerman, & Izard, 1995). Most recently, research has focused increasing attention on the role of emotion regulation as a potential causal mechanism in the development of psychological conditions, including anxiety. For example, Orgeta (2011) examined anxiety symptoms and emotion regulation in older adults (*N* = 167, 60 to 94 years of age), finding that many aspects of effective emotion management were related to anxiety symptoms and that older adults who experienced increased levels of anxiety were more likely to report emotion dysregulation. In a review of the relationship between emotion regulation and anxiety disorders, Amstadter (2008) suggests that emotion regulation plays a central role in the development and maintenance of anxiety
disorders. Likewise, the emotion dysregulation model of GAD (Mennin, Heimberg, Turk, & Fresco, 2002) posits that deficits in emotion regulation underlie the development of GAD. A growing body of literature supports this model, finding an association between GAD and increased emotion dysregulation (e.g., Roemer, et al., 2009; Tull, Stipelman, Salters-Pedneault, & Gratz, 2009). For example, in a series of studies, both analogue and clinical GAD samples displayed increased emotion dysregulation compared to control groups; components of emotion dysregulation were also predictive of a GAD diagnosis when controlling for anxiety-related variables (Mennin et al., 2005). Similarly, in a sample of university students \((N = 325, \text{mean age} = 23.8 \text{ years})\), analogue GAD diagnosis was associated with increased emotion dysregulation (Salters-Pedneault, Roemer, Tull, Rucker, & Mennin, 2006).

1.3.3.1 Emotion regulation and health anxiety. Two previous studies have examined the relationship between emotion regulation and health anxiety, specifically. Both of these studies focused on emotion management strategies, as opposed to various dimensions of emotion regulation or overall emotion regulation abilities. Fergus and Valentiner (2010) examined the association between emotion regulation strategies (i.e., cognitive reappraisal, emotion suppression, cognitive avoidance) and health anxiety in a college student sample \((N = 503, \text{mean age} = 19.1 \text{ years})\). The findings supported an association between emotion dysregulation variables (i.e., cognitive avoidance and cognitive reappraisal) and the disease conviction component of health anxiety. Similarly, Görgen, Hiller, and Witthöft (2013) found that emotion dysregulation strategies (e.g., expressive suppression) were associated with elevated health anxiety.
1.3.3.2 Emotion regulation and childhood abuse. Emotion dysregulation has also been associated with childhood abuse and neglect. Previous research has found that children who have experienced maltreatment display significant deficits in emotion regulation compared to children without a history of maltreatment (e.g., Shields & Cicchetti, 1998; Shipman, Edwards, Brown, Swisher, & Jennings, 2005; Shipman, Zeman, Penza, & Champion, 2000). These findings are consistent with theoretical literature that proposes that childhood abuse impedes the development of adaptive emotion regulation by placing overwhelming emotional demands on children while also failing to teach them emotion regulation strategies (e.g., Thompson & Calkins, 1996). As such, emotion regulation has also been analyzed as a potential mediating factor in the relationship between childhood maltreatment and psychopathology. For example, a recent study examined the role of emotion regulation in maltreated (n = 111) and non-maltreated (n = 110) children (seven to 10 years of age) and found that emotion regulation mediated the relationship between childhood maltreatment and psychopathology (i.e., internalizing and externalizing problems; Alink, Cicchetti, Kim, & Rogosch, 2009). In addition, Soenke and colleagues (2010) examined the mediating role of emotion regulation in the relationship between childhood abuse history and generalized anxiety in an undergraduate student sample (N = 396, mean age = 20.3 years). Their findings provided support for the mediating role of two dimensions of emotion dysregulation (i.e., difficulties controlling impulsive behaviour when distressed and limited access to effective emotion regulation strategies) in the relationship between emotional abuse and generalized anxiety.
The abovementioned research findings support a relationship between emotion regulation abilities and both childhood maltreatment and psychopathology (including anxiety), and the possible mediating role of emotion regulation. There is limited research on the relationship between emotion regulation and health anxiety and currently no available literature exploring the potential mediating role of emotion regulation in the relationship between childhood abuse and health anxiety in adulthood. Additional research in warranted to provide a further understanding of the role of emotion regulation in the experience of health anxiety.

1.3.4 Attachment. Attachment theory (Bowlby, 1969, 1973, 1988) emphasizes the influence of early intimate relationships, usually with parents, on one’s subsequent interactions and relationships with other people. The quality and patterns in these relationships are expressed in attachment styles. Attachment styles are established early in life through the emotional and supportive relationships between the child and primary caregivers; they reflect the caregiver’s ability to provide protection, comfort, and a secure foundation for the child, especially during times of threat and distress (Bowlby, 1969). Subsequently, the quality of this emotional connection leads to the development of attachment styles based on these past experiences. An individual’s attachment style is thought to remain relatively stable from childhood through adulthood (e.g., Bowlby, 1979; Hazan & Shaver, 1987; Waters, Merrick, Treboux, Crowell, & Albersheim, 2000). There are a number of approaches to assess and categorize attachment, although all measures differentiate between secure attachment orientation and subtypes of insecure attachment orientations. Measures of attachment either classify individuals in terms of categories of attachment styles or assess attachment patterns as a dimensional construct;
there is no agreement as to whether attachment is best understood as a categorical or dimensional construct (Ravitz, Maunder, Hunter, Sthankiya, & Lancee, 2010).

1.3.4.1 Attachment models. As research in the area of attachment expanded, various models of attachment styles have been developed. Traditionally, Ainsworth (1978) described three primary childhood attachment styles: avoidant, anxious-ambivalent, and secure. Hazan and Shaver (1987) modeled their categorization of adult attachment styles after these original three categories. Main, Kaplan, and Cassidy (1985) developed an attachment model that included four categories, namely, dismissing, preoccupied, unresolved-disorganized, and secure-autonomous. Following this development, Bartholomew argued that two distinctive avoidant patterns could be understood and reformed the four-category model.

Bartholomew and Horowitz (1991) developed an empirically supported model of adult attachment that is comprised of one secure and three insecure attachment styles. According to this model, people with a secure attachment style find it easy to form close relationships and are comfortable depending on others and having others depend on them without fears of rejection and distress about being alone. People with one of the three insecure attachment styles do not experience the same level of comfort and confidence in relationships as those with a secure attachment orientation. For example, people with a fearful attachment style typically find it difficult to trust or depend on others and fear being hurt when developing close relationships with others. Those with a preoccupied attachment style wish to be completely emotionally intimate in relationships, although others may be reluctant to be as close, and may worry that they value others more than they feel valued in relationships. People with a dismissing attachment style are generally
content without close emotional relationships, and value independence and being self-sufficient.

More recently, research suggests that the variation in attachment orientation is more appropriately conceptualized as continuous measures of attachment dimensions (Fraley & Spieker, 2003; Fraley & Waller, 1998). Fraley and colleagues argue that the four-category model of attachment is best characterized by the two-dimensional system, which consists of two converging dimensions of attachment insecurity: attachment anxiety and attachment avoidance. Specifically, low scores on both attachment anxiety and attachment avoidance reflect a secure attachment style. High scores on both dimensions reflect a fearful attachment style. High attachment anxiety and low attachment avoidance reflects the preoccupied attachment style. High attachment avoidance and low attachment anxiety reflects a dismissive attachment style. Utilizing dimensional measurement increases the precision of the assessment and increases statistical power compared to a categorical approach (Fraley & Shaver, 2000).

1.3.4.2 Attachment and health anxiety. Attachment is associated with a variety of mental health conditions including anxiety and depression (e.g., Bekker & Croon, 2010). Recent research has identified a relationship between attachment styles and health anxiety and associated behaviours (e.g., Ciechanowski et al., 2002; Wearden et al., 2006). It is thought that attachment theory can provide a useful model for understanding how an individual’s approach towards interpersonal interactions can influence health-related experiences and behaviours (Maunder & Hunter, 2001). The interpersonal model of health anxiety (Stuart & Noyes, 1999) proposes that illness behaviours displayed by individuals with elevated health anxiety can be best understood as a form of social
behavior that is motivated by maladaptive attachment styles. They hold that attachment is closely involved in care-seeking behaviour (directed towards both significant others and medical professionals) and is a pattern of behaviour intended to evoke comfort and a sense of security. Insecure attachment orientation fosters more intense care-seeking behaviours. This model also proposes that adverse childhood experiences, including childhood abuse, significantly impacts the development of attachment styles and influences illness behaviour, such as persistent care-seeking, into adulthood. Consistent with the interpersonal model, Hunter and Maunder (2001), utilizing a three-category model of attachment, proposed that individuals who are anxiously attached (comparable to Bartholomew and Horowitz’s preoccupied classification) would partake in excessive reassurance and care-seeking, would be discontent with the reassurance provided to them, and would have little confidence in their own ability to deal with illness.

In support of the interpersonal model, Ciechanowski and colleagues (2002) found that in adult female patients ($N = 701$, mean age $= 43.4$ years), those with a preoccupied attachment style ($n = 156$, mean age $= 42.1$ years) had the highest medical care utilization, at the highest cost, compared to patients with the other three attachment styles. These results indicate that attachment style may be an important influence when considering a patient’s perception of symptoms and health care utilization. Schmidt, Strauss, and Braehler (2002) examined health anxiety and attachment in a representative German sample ($N = 1997$, 16 to 92 years of age) and found that elevated levels of health anxiety were associated with two anxious attachment styles. Noyes and colleagues (2003) also found associations between elevated health anxiety and insecure attachment styles in adults attending a general medical clinic. Furthermore, a study of
117 undergraduate students (18 to 31 years of age) found that those with a preoccupied attachment style \((n = 17)\) reported significantly higher scores of hypochondriasis compared to those with other attachment styles (Wearden et al., 2006). Overall, these studies provide general support for the interpersonal model of health anxiety as the findings demonstrated a significant relationship between insecure attachment and elevated health anxiety. However, the aforementioned research does not examine more specific factors in the interpersonal model such as the hypothesized relationship between childhood maltreatment, attachment, and health anxiety.

1.3.4.3 Attachment and childhood abuse. A growing body of literature supports the relationship between childhood maltreatment and insecure attachment styles (e.g., Toth & Cicchetti, 1996; Stalker & Davies, 1995; Styron & Janoff-Bulman, 1997). For example, Muller, Sicoli, and Lemieux (2000) found that 76% of adults with a history of childhood abuse \((n = 66, \text{mean age} = 33 \text{ years})\) had one of the three insecure attachment styles (i.e., dismissing, fearful, or preoccupied). It has been proposed that traumatic experiences in childhood followed by inconsistent or unsupportive care, would lead to persistent interpersonal patterns of excessive care-seeking behaviours (Stuart & Noyes, 1999). The aforementioned research findings support an association between attachment styles and both childhood maltreatment and adult health anxiety; therefore, it is possible that attachment style plays a mediating role when considering the path from abuse in childhood to the experience of health anxiety in adulthood.

To lend further support to this notion, Waldinger and colleagues (2006) examined whether insecure attachment mediated the relationship between childhood abuse and adult somatization in 101 male (mean age = 33.2 years) and 101 female (mean age =
31.6 years) participants. The results of this study found that childhood abuse was associated with higher levels of both insecure attachment and somatization. Moreover, fearful attachment mediated the relationship between childhood abuse and somatization for women.

1.4 Purposes

The overall purpose of the current study was to expand upon the existing research on health anxiety by clarifying the roles of childhood abuse, emotion regulation, and attachment orientation in the development of this condition. Furthermore, existing research in this area typically focuses on individuals with hypochondriasis, whereas the current research examined levels of health anxiety in an effort to include a spectrum of health-related worries and anxieties, including those with subclinical symptoms. This investigation also included measures of emotional abuse and neglect – forms of abuse that have typically been excluded from this area of research. More specifically, the primary aims of the current investigation were fourfold: (1) to explore the relationships between health anxiety, childhood abuse, and the associated constructs (i.e., emotion regulation, attachment orientation, anxiety sensitivity, anxiety, and depression); (2) to investigate the utility of childhood abuse experiences and the associated constructs in predicting health anxiety; (3) to examine the possible mediating role of emotion regulation in the relationship between childhood abuse and health anxiety in adulthood; and (4) to examine the possible mediating role of attachment in the relationship between childhood abuse and health anxiety in adulthood.
1.5 Hypotheses

Our primary hypotheses were fourfold. We hypothesized that (1) there would be significant, positive associations between health anxiety, childhood abuse experiences, and the associated constructs; (2) childhood abuse experiences and the associated constructs would be predictive of health anxiety; (3) emotion regulation would mediate the relationship between childhood abuse and health anxiety; and (4) insecure attachment styles would also play a mediating role in the relationship between childhood abuse and health anxiety.

Based on the findings previously reviewed, our secondary hypotheses referred to the associated constructs, specifically, and were as follows: (1) childhood abuse severity would demonstrate significant, positive associations with measures of anxiety, depression, and anxiety sensitivity; (2) particular associated constructs (i.e., anxiety, depression, anxiety sensitivity) would demonstrate stronger relationships with health anxiety compared to childhood abuse severity as the existing literature consistently supports associations between health anxiety and anxiety (e.g., Noyes et al., 1994), depression (e.g., Barsky et al., 1992), and anxiety sensitivity (e.g., Abramowitz et al., 2007; Stewart & Watt, 2000); and (3) anxiety sensitivity would play a mediating role in the relationship between childhood abuse and health anxiety given its mediating role in the relationship between childhood learning experiences and the development of health anxiety among young adults (Watt & Stewart, 2000).
2.0 Methods

2.1 Participants

A power analysis was conducted using G*Power to determine an adequate sample size for the current research (Faul, Erdfelder, Buchner, & Lang, 2009). The analysis was conducted for linear multiple regression using a medium effect size (.15), a power of .90 ($\alpha = .05$), and six predictor variables. Six predictor variables were entered into the evaluation, as this was the maximum number of predictors that were entered into a multiple regression analysis, therefore providing a conservative estimate of the required sample size. The results revealed that 88 participants would achieve adequate power when examining the overall association between childhood abuse and levels of health anxiety. Male and female adults between 18 to 29 years of age were recruited for the current study; it is relevant to conduct this research on this particular age group because it is thought that early adulthood is the most common age of onset for severe health anxiety (APA, 2000).

Students in undergraduate psychology courses were pre-screened to obtain information regarding the presence or absence of childhood abuse experiences (see Appendix D). Students who endorsed experiencing at least one of the five childhood abuse categories (i.e., physical abuse, emotional abuse, sexual abuse, emotional neglect, physical neglect) were contacted to participate in the online study via an email invitation. A random sample of students who did not report a history of childhood abuse were also contacted via email and invited to participate in the online study. Approximately the same numbers of students with and without a history of childhood abuse were contacted to ensure that the study sample contained enough participants who reported childhood abuse.


abuse experiences. The majority of the students who were invited to participate in the online study did so through the Department of Psychology Participant Pool. Students who participated in the study through the Participant Pool were compensated with one extra course credit in their psychology course. One of the courses was not eligible to participate through the Participant Pool; therefore, the students who were contacted from this class were provided with a direct link to the online study. These students were not eligible for the additional course credit and were, instead, entered into a draw to win one of two $50 gift certificates to a local shopping mall.

Approximately 605 students were approached to participate in the pre-screen throughout September and October 2012. A total of 549 students completed the pre-screen questionnaire (see Figure 1 for a summary of participant recruitment and retention). A number of students were deemed ineligible based on age (i.e., they were younger than 18 years of age; \( n = 18 \)), not providing consent (\( n = 16 \)), not understanding the pre-screen information (\( n = 4 \)), and not completing the pre-screen questionnaire (\( n = 1 \)). Therefore, 39 of the pre-screen questionnaires were omitted and 510 students were deemed eligible to participate. A total of 403 students were invited via email to participate in the online study, of which 213 students endorsed a history of at least one category of childhood abuse and 190 students did not report a history of childhood abuse. A total of 202 individuals participated in the online study; a minority of participants were disqualified because they did not complete the study questionnaires (\( n = 16 \)) or due to their age (\( n = 5 \)). Overall, the study comprised 181 participants, of which 104 endorsed a history of childhood abuse experiences and 77 did not endorse a history of childhood abuse.
Summary of Participant Recruitment and Retention

- 549 students pre-screened
  - 510 eligible students
    - 181 eligible participants
      - 104 with childhood abuse history
    - 21 ineligible participants
      - 77 with no childhood abuse history
  - 39 ineligible students
2.2 Measures

2.2.1 Pre-Screen Questionnaire (Appendix D). Students were pre-screened for a history of childhood abuse using a brief questionnaire comprised of items from the Adverse Childhood Experiences study (ACE; Felitti et al., 1998). The ACE is a retrospective, self-report questionnaire that assesses the occurrence of adverse childhood experiences up to the age of 18. The ACE questions are constructed from items from published measures including the Conflict Tactics Scale (Straus, 1979; Straus, Hamby, Boney-McCoy, & Sugarman, 1996) and the Childhood Trauma Questionnaire (CTQ; Bernstein, Fink, Handelsman, & Foote, 1994). The measure consists of yes/no questions pertaining to adverse childhood experiences, including items concerning different forms of childhood abuse. For the purposes of this study, 10 questions from the ACE were utilized, consisting of the items assessing physical abuse, emotional abuse, sexual abuse, emotional neglect, and physical neglect (i.e., two questions from each category). Participants were defined as being exposed to a specific category of abuse if they responded “yes” to either or both of the category items. Participants were defined as being exposed to childhood abuse if they responded “yes” to one or more of any of the pre-screening questions.

2.2.2 Demographics Information Form (Appendix E). Basic demographic information was obtained via a short demographics form. Participants provided personal information regarding their age, sex, relationship status, ethnicity, and medical and psychiatric history. This form also obtained information pertaining to abuse history including age that abuse occurred and the duration of abuse.
2.2.3 Short Health Anxiety Index (Appendix F; SHAI; Salkovskis, Rimes, Warwick, & Clark, 2002). The SHAI is a self-report measure of health anxiety in adults. The measure consists of 18 items, each comprised of four statements from which the respondent chooses the statement that best captures their experience over the past six months. The SHAI includes two subscales – a 14-item subscale that assesses health anxiety independent of health status and a supplemental four-item subscale that measures perceived negative consequences of having an illness. The SHAI has been administered as an 18-item measure and as a 14-item measure, which excludes the latter subscale (Alberts, Sharpe, Kehler, & Hadjistavropoulos, 2011). The current study utilized the 14-item version of the SHAI; the four-item subscale was not utilized, as it does not directly measure health anxiety and is not appropriate for respondents with a medical condition. This measure consists of items scored on a scale from 0 (no symptoms) to 3 (severe symptoms) and the sum of the items produces a total score of health anxiety ranging from 0 to 42. The 14-item version has been found to be a reliable and validity measure of health anxiety (Salkovskis, et al., 2002). The SHAI demonstrated high internal consistency (α = .87) in the current study.

2.2.4 Childhood Trauma Questionnaire (Appendix G; Bernstein et al., 1994). The CTQ is a retrospective, self-report measure that assesses childhood traumatic experiences and the severity of these experiences, which is used in the current study as the overall measure of childhood abuse experiences. The measure consists of 28 items, most of which are rated on a 5-point Likert scale ranging from 1 (never) to 5 (very often). Three dichotomous items (0 = never, 1 = all other responses) comprise a minimization/denial scale to determine potential underreporting of maltreatment. The
CTQ produces a total score, ranging from 25 to 125, and scores for the following five subscales: (1) emotional abuse, (2) physical abuse, (3) sexual abuse, (4) emotional neglect, and (5) physical neglect. Each subscale produces a score ranging from 5 to 25. The CTQ has demonstrated high internal consistency and good test-retest (2-6 months) reliability (Bernstein et al., 1994). This measure has also been found to be a valid measure of abuse and neglect in Canadian undergraduate student samples (Paivio & Cramer, 2004). For the current study, the overall CTQ score had high internal consistency (α = .91), and the subscales had Cronbach’s alpha scores ranging from .74 to .95.

**2.2.5 Difficulties in Emotion Regulation Scale (Appendix H; DERS; Gratz & Roemer, 2004).** The DERS is a self-report measure that assesses various emotion regulation dimensions including personal acceptance of emotional responses, ability to accomplish tasks when overwhelmed, ability to control emotions and subsequent reactions, emotional awareness, utilization of strategies to regulate emotions, and the ability to understand and interpret personal emotion. The measure consists of 36 items that are rated on a 5-point Likert scale ranging from 1 (almost never) to 5 (almost always). The DERS yields an overall score ranging from 36 to 180 (higher scores indicate greater difficulties with emotion regulation). This measure has demonstrated good test-retest reliability, adequate construct and predictive validity, and high internal consistency (Gratz & Roemer, 2004). For the current study, the overall DERS score demonstrated high internal consistency (α = .95).

**2.2.6 Experiences in Close Relationships-Revised (Appendix I; ECR-R; Fraley, Waller, & Brennan, 2000).** The ECR-R is a self-report questionnaire that
measures adult attachment orientation. The measure consists of two subscales, attachment anxiety (ECR-R-AN) and attachment avoidance (ECR-R-AV), which each contain 18 items. The ECR-R-AN measures fear of interpersonal rejection, the need for approval from others, and the extent to which a person is concerned about the availability of others. The ECR-R-AV measures fear of interpersonal closeness, reluctance to self-disclose, and the need for self-reliance. All responses are rated on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree), and each subscale yields a score ranging from 18 to 126. The ECR-R has demonstrated good psychometric properties (e.g., Sibley & Liu, 2004; Sibley, Fischer, & Liu, 2005) and is among the most commonly used attachment scales in psychosomatic research (Ravitz et al., 2010). For the current study, both the ECR-R-AN and ECR-R-AV demonstrated high internal consistency with reliability coefficients (Cronbach’s alpha) of .93 and .94, respectively.

2.2.7 Center for Epidemiologic Studies Depression Scale-Revised (Appendix J; CESD-R; Eaton, Smith, Ybarra, Muntaner, & Tien, 2004). The CESD-R is the revised version of the Center for Epidemiologic Studies Depression Scale (Radloff, 1977) and is a self-report measure of depressive symptomatology in adults. The measure is comprised of 20 items, which are rated on a 5-point Likert scale ranging from 0 (not at all or less than one day) to 4 (nearly every day for 2 weeks). The CESD-R includes items that reflect symptoms of depression including low mood, feelings of hopelessness and worthlessness, loss of appetite, sleep disruption, psychomotor agitation or retardation, which have been utilized in previously validated scales of depression (Radloff, 1977). Total scores range from 0 to 80 with higher scores indicating increased
depressive symptoms. The CES-D has high internal consistency ($\alpha = .88-.93$) across diverse populations (Eaton et al., 2004; Van Dam & Earleywine, 2011) and well-established validity (Eaton et al., 2004; Van Dam & Earleywine, 2011). The CESD-R demonstrated high internal consistency ($\alpha = .94$) in the current study.

2.2.8 Anxiety Sensitivity Index-3 (Appendix K; ASI-3; Taylor et al., 2007). The ASI-3 is a self-report measure that assesses an individual’s sensitivity to anxiety symptoms based on the conviction that they could have harmful social, cognitive, or physiological consequences. The measure consists of 18 items, which are rated on a 5-point Likert scale to evaluate the degree to which the respondent agrees with each statement ranging from 0 (very little) to 4 (very much). Total scores range from 0 to 72 and are calculated by summing the values for each item. The ASI-3 has demonstrated convergent, discriminant, and criterion validity (Taylor et al., 2007). For the current study, this measure demonstrated high internal consistency ($\alpha = .89$).

2.2.9 Trait Form of the State-Trait Anxiety Inventory for Adults - Form Y (Appendix L; STAI-T; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). The STAI-T is a self-report measure that assesses an individual’s general level of anxiety. The measure consists of 20 items that are rated on a 4-point Likert scale ranging from 1 (almost never/not at all) to 4 (almost always/very much so). Total scores range from 20 to 80 with higher scores indicating greater anxiety. The STAI-T was found to have good internal consistency ($\alpha = .89-.96$) and high test-retest reliability ($r = .65-.86$; Spielberger et al., 1983). For the current study the reliability coefficient (Cronbach’s alpha) was .94.
2.3 Procedure

Ethical approval to conduct this research was obtained from the University of Regina Research Ethics Board (see Appendix A). Following ethical approval, the Pre-Screen Questionnaire and a pre-screen consent form were distributed in psychology undergraduate classrooms and were completed in-class (for the pre-screen consent form see Appendix B). The Pre-Screen Questionnaire took approximately 10 minutes to complete. The students were notified of the potentially distressing content of the pre-screen questions and were provided with contact information for local crisis and counseling services if the students experienced distress regarding the pre-screen content. The students were also notified that there was no compensation for participation in the pre-screening. Subsequently, students who endorsed any item on the Pre-Screen Questionnaire, or those who reported no childhood abuse history and were randomly selected, were invited to participate in the online study hosted by surveymonkey.com. The online survey site provided information about the study and participants could subsequently provide online consent to partake in the full study (for the full study consent form see Appendix C). Prior to beginning the survey, participants were notified about the potentially distressing nature of the questionnaires and were provided with contact information for local crisis and counseling services and contact information for a mental health professional that was available in the event that the survey content elicited distress. The online survey also included a “skip” function whereby participants who experienced extreme distress could automatically discontinue the survey and be directed to a page with the aforementioned contact information and an option for the participant to provide their own contact information for the purposes of being contacted by a mental health professional.
health professional in regards to the distress elicited by the survey content. One participant utilized this “skip” function and provided personal contact information to request contact by a mental health professional. A registered clinical psychologist contacted this participant by phone and the participant indicated that her distress was due to whether she was answering the survey questions with appropriate detail, as she did not want to botch the survey results. She did not require further assistance with emotional distress due to the survey content.

Next, the participants were asked to complete a brief demographics form, the Pre-Screen Questionnaire (reiteratively), and the seven measures (i.e., SHAI, CTQ, DERS, ECR-R, CES-D, ASI-3, STAI-T), which took approximately one hour. Those who participated in the online survey received either a 1% course credit or were entered into a draw to win one of two gift certificates as a token of appreciation. As the online surveys were completed, the data were entered into the Software Package for the Social Sciences (SPSS: version 18.0), which was the program utilized for statistical analyses following the completion of data collection.

3.0 Results

3.1 Preliminary Analyses

The standard values for the total and subscale scores for each measure were calculated and outliers were defined as cases with 3.29 standard deviations above or below the mean (z-score values that equaled ±3.29), as recommended by Tabachnick and Fidell (2001). If the z-score of a data point exceeded this cutoff, the outlying score was changed to one unit higher than the next most extreme score that remained within the data cutoff parameter. Outliers were identified and changed for the SHAI total score.
(2 cases), CTQ total score (1 case), CTQ physical abuse subscale (2 cases), CTQ sexual abuse subscale (7 cases), CTQ physical neglect subscale (2 cases), ASI total score (1 case), CESD-R total score (2 cases), and DERS total score (1 case).

Next, skewness and kurtosis were examined for each measure. As recommended by Field (2009), the skewness and kurtosis statistics were divided by their respective standard error to produce a z-score value; for larger sample sizes, z-scores above or below 3.29 are considered to be non-normal. Through this process it was revealed that a number of measures displayed a non-normal distribution, namely, the SHAI, CTQ, ASI, CESD-R, and DERS. Consequently, the values for these measures were transformed using square root and logarithmic transformations, as these are recommended approaches for reducing positive skew (Field, 2009). Skewness and kurtosis z-scores pre- and post-transformations are presented in Table 1 for measures that demonstrated a non-normal distribution. A number of the abuse subscales (i.e., physical abuse, sexual abuse, physical neglect) remained considerably non-normal following data transformation; the distributions for these measures were indicative of minimal occurrence of these types of abuse. This was expected in our university student sample, as severe forms of these types of abuse tend to be less common. All research analyses were conducted twice, with the non-transformed data set and again with the dataset that included the transformed variables. There were no significant differences in the results between the two sets of data, with one exception – with the non-transformed data, physical abuse did not demonstrate a significant association with health anxiety, $r(179) = .111, p = .136$; however, with the transformed variables, physical abuse and health anxiety demonstrated a positive, significant relationship, $r(179) = .158, p = .033$. As the difference between
Table 1

**Skewness and Kurtosis Z-scores Pre- and Post-Transformations**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Pre-transformation</th>
<th>Post-transformation</th>
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<tbody>
<tr>
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<td>Skewness</td>
<td>Kurtosis</td>
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<td><strong>Square Root Transformations</strong></td>
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<td>1.84</td>
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<td><strong>Logarithmic Transformations</strong></td>
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<td>CESD-R</td>
<td>8.02</td>
<td>5.43</td>
</tr>
<tr>
<td>DERS</td>
<td>3.97</td>
<td>0.65</td>
</tr>
</tbody>
</table>

*Note. Z-score = skewness or kurtosis statistic divided by its standard error; SHAI = Short Health Anxiety Index; CTQ = Childhood Trauma Questionnaire; ASI = Anxiety Sensitivity Index; CESD-R = Center for Epidemiologic Studies Depression Scale – Revised; DERS = Difficulties in Emotion Regulation Scale.*
the datasets was minimal, the non-transformed data were utilized and will be presented to simplify data interpretation.

3.2 Descriptive Information

3.2.1 Demographics. The participants comprised 181 undergraduate students ranging from 18 to 29 years of age \([M_{\text{age}} = 20.29 \text{ years} \ (SD = 2.31)]\). There were 38 male participants (21.0%) and 141 female participants (79%). The unequal sex distribution was likely due to the recruitment of participants through psychology courses, which comprise predominantly female students. The majority of participants were Caucasian/white \((n = 140; 77.3\%)\), while other ethnicities included Asian \((n = 14; 7.7\%)\), multiple ethnicities \((n = 8; 4.4\%)\), Metis \((n = 6; 3.3\%)\), Hispanic \((n = 3; 1.7\%)\), Middle Eastern \((n = 3; 1.7\%)\), other ethnic origins \((n = 3; 1.7\%)\), African/black \((n = 2; 1.1\%)\), and Aboriginal/First Nations \((n = 2; 1.1\%)\). The majority of participants were in their first year of university \((n = 68; 37.6\%)\), followed by second year of university \((n = 52; 28.7\%)\), third year of university \((n = 36; 19.9\%)\), fourth year of university \((n = 19; 10.5\%)\), and fifth or more year of university \((n = 6; 3.3\%)\). Participants reported either being in a relationship \((n = 99; 54.7\%)\) or being single \((n = 82; 45.3\%)\). The majority of participants reported that their parent’s relationship status was married/common-law \((n = 125; 69.1\%)\). A number of participants reported currently having a diagnosed medical condition \((n = 32; 17.7\%)\) or a diagnosed medical condition or serious injury during their childhood \((n = 49; 27.1\%)\). A number of participants also reported currently \((n = 27; 14.9\%)\), or previously \((n = 30; 16.6\%)\), having a mental health condition. For descriptive information by sex within the overall sample refer to Table 2.
### Table 2

**Demographic Information for the Entire Sample as a Function of Sex**

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Male(^a)</th>
<th>Female(^b)</th>
<th>Total(^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(M (SD))</td>
<td>20.58 (2.42)</td>
<td>20.22 (2.28)</td>
<td>20.29 (2.31)</td>
</tr>
<tr>
<td>(n (%))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White/Caucasian</td>
<td>25 (65.8)</td>
<td>115 (80.4)</td>
<td>140 (77.3)</td>
</tr>
<tr>
<td>Asian</td>
<td>7 (18.4)</td>
<td>7 (4.9)</td>
<td>14 (7.7)</td>
</tr>
<tr>
<td>Black/African</td>
<td>1 (2.6)</td>
<td>1 (0.7)</td>
<td>2 (1.1)</td>
</tr>
<tr>
<td>Aboriginal/First Nations</td>
<td>-</td>
<td>2 (1.4)</td>
<td>2 (1.1)</td>
</tr>
<tr>
<td>Metis</td>
<td>-</td>
<td>6 (4.2)</td>
<td>6 (3.3)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>2 (5.3)</td>
<td>1 (0.7)</td>
<td>3 (1.7)</td>
</tr>
<tr>
<td>Middle Eastern</td>
<td>1 (2.6)</td>
<td>2 (1.4)</td>
<td>3 (1.7)</td>
</tr>
<tr>
<td>Multiple Ethnicities</td>
<td>2 (5.3)</td>
<td>6 (4.2)</td>
<td>8 (4.4)</td>
</tr>
<tr>
<td>Other</td>
<td>-</td>
<td>3 (2.1)</td>
<td>3 (1.7)</td>
</tr>
<tr>
<td><strong>Level of education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First year university</td>
<td>10 (26.3)</td>
<td>58 (40.6)</td>
<td>68 (37.6)</td>
</tr>
<tr>
<td>Second year university</td>
<td>10 (26.3)</td>
<td>42 (29.4)</td>
<td>52 (28.7)</td>
</tr>
<tr>
<td>Third year university</td>
<td>10 (26.3)</td>
<td>26 (18.2)</td>
<td>36 (19.9)</td>
</tr>
<tr>
<td>Fourth year university</td>
<td>7 (18.4)</td>
<td>12 (8.4)</td>
<td>19 (10.5)</td>
</tr>
<tr>
<td>Fifth year university or more</td>
<td>1 (2.6)</td>
<td>5 (3.5)</td>
<td>6 (3.3)</td>
</tr>
<tr>
<td><strong>Relationship status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>30 (78.9)</td>
<td>52 (36.4)</td>
<td>82 (45.3)</td>
</tr>
<tr>
<td>In a relationship</td>
<td>8 (21.1)</td>
<td>91 (63.6)</td>
<td>99 (54.7)</td>
</tr>
<tr>
<td><strong>Parents' relationship status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married/common-law</td>
<td>25 (65.8)</td>
<td>100 (69.9)</td>
<td>125 (69.1)</td>
</tr>
<tr>
<td>Divorced/separated</td>
<td>13 (34.2)</td>
<td>37 (25.9)</td>
<td>50 (27.6)</td>
</tr>
<tr>
<td>Other</td>
<td>-</td>
<td>6 (4.2)</td>
<td>6 (3.3)</td>
</tr>
<tr>
<td><strong>Diagnosed medical condition</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absent</td>
<td>34 (89.5)</td>
<td>115 (80.4)</td>
<td>149 (82.3)</td>
</tr>
<tr>
<td>Present</td>
<td>4 (10.5)</td>
<td>28 (19.6)</td>
<td>32 (17.7)</td>
</tr>
<tr>
<td><strong>Childhood medical condition/serious injury</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absent</td>
<td>28 (73.7)</td>
<td>104 (72.7)</td>
<td>132 (72.9)</td>
</tr>
<tr>
<td>Present</td>
<td>10 (26.3)</td>
<td>39 (27.3)</td>
<td>49 (27.1)</td>
</tr>
<tr>
<td><strong>Current mental health condition</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADHD</td>
<td>-</td>
<td>4 (2.8)</td>
<td>4 (2.2)</td>
</tr>
<tr>
<td>Mental Health Condition</td>
<td>N (Facet 1)</td>
<td>N (Facet 2)</td>
<td>N (Facet 3)</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------------</td>
<td>------------</td>
<td>------------</td>
</tr>
<tr>
<td>Anxiety</td>
<td>-</td>
<td>10 (7.0)</td>
<td>10 (5.5)</td>
</tr>
<tr>
<td>Depression</td>
<td>1 (2.6)</td>
<td>7 (4.9)</td>
<td>8 (4.4)</td>
</tr>
<tr>
<td>Anxiety and depression</td>
<td>5 (3.5)</td>
<td>5 (2.8)</td>
<td></td>
</tr>
<tr>
<td>ADHD</td>
<td>-</td>
<td>1 (0.7)</td>
<td>1 (0.6)</td>
</tr>
<tr>
<td>Anxiety</td>
<td>-</td>
<td>4 (2.8)</td>
<td>4 (2.2)</td>
</tr>
<tr>
<td>Depression</td>
<td>1 (2.6)</td>
<td>17 (11.9)</td>
<td>18 (9.9)</td>
</tr>
<tr>
<td>Anxiety and depression</td>
<td>-</td>
<td>4 (2.8)</td>
<td>4 (2.2)</td>
</tr>
<tr>
<td>Bipolar</td>
<td>-</td>
<td>1 (0.7)</td>
<td>1 (0.6)</td>
</tr>
</tbody>
</table>

*Note.* ADHD = Attention-Deficit/Hyperactivity Disorder.

\(^a_n = 38. \ ^b_n = 143. \ ^cN = 181.*
The descriptive characteristics of the measures of interest for the overall sample can be found in Table 3. Independent samples t-tests were conducted to compare the overall scores of the measures of interest between males and females (refer to Table 4). There was a significant difference in scores between males and females for levels of health anxiety, overall abuse severity, emotional abuse severity, emotional neglect severity, and general anxiety. These findings indicate that the females in this sample reported significantly more health anxiety, overall childhood abuse, emotional abuse, emotional neglect, and general anxiety compared to the males. It is difficult to meaningfully analyze these differences between male and female participants due to the small number of male participants and the unequal group sizes.
Table 3

Ranges, Means, Standard Deviations, and Reliability Coefficients for Participants’ Scores

<table>
<thead>
<tr>
<th>Measure</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
<th>Minimum</th>
<th>Maximum</th>
<th>( \alpha )</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHAI</td>
<td>12.28</td>
<td>6.13</td>
<td>0-42</td>
<td>1</td>
<td>32</td>
<td>0.87</td>
</tr>
<tr>
<td>CTQ</td>
<td>40.34</td>
<td>14.38</td>
<td>25-125</td>
<td>25</td>
<td>84</td>
<td>0.91</td>
</tr>
<tr>
<td>Emotional Abuse</td>
<td>10.45</td>
<td>5.39</td>
<td>5-25</td>
<td>5</td>
<td>25</td>
<td>0.91</td>
</tr>
<tr>
<td>Physical Abuse</td>
<td>6.70</td>
<td>2.86</td>
<td>5-25</td>
<td>5</td>
<td>17</td>
<td>0.76</td>
</tr>
<tr>
<td>Sexual Abuse</td>
<td>6.3</td>
<td>3.62</td>
<td>5-25</td>
<td>5</td>
<td>20</td>
<td>0.95</td>
</tr>
<tr>
<td>Emotional Neglect</td>
<td>10.13</td>
<td>4.67</td>
<td>5-25</td>
<td>5</td>
<td>25</td>
<td>0.91</td>
</tr>
<tr>
<td>Physical Neglect</td>
<td>6.67</td>
<td>2.54</td>
<td>5-25</td>
<td>5</td>
<td>16</td>
<td>0.74</td>
</tr>
<tr>
<td>DERS</td>
<td>81.66</td>
<td>22.58</td>
<td>36-180</td>
<td>38</td>
<td>153</td>
<td>0.95</td>
</tr>
<tr>
<td>ECRR-AN</td>
<td>63.33</td>
<td>21.94</td>
<td>18-126</td>
<td>19</td>
<td>118</td>
<td>0.93</td>
</tr>
<tr>
<td>ECRR-AV</td>
<td>71.89</td>
<td>22.04</td>
<td>18-126</td>
<td>20</td>
<td>123</td>
<td>0.94</td>
</tr>
<tr>
<td>CESD-R</td>
<td>15.94</td>
<td>14.02</td>
<td>0-80</td>
<td>0</td>
<td>63</td>
<td>0.94</td>
</tr>
<tr>
<td>ASI-3</td>
<td>15.18</td>
<td>11.36</td>
<td>0-72</td>
<td>0</td>
<td>52</td>
<td>0.89</td>
</tr>
<tr>
<td>STAI-T</td>
<td>42.75</td>
<td>11.83</td>
<td>20-80</td>
<td>20</td>
<td>78</td>
<td>0.94</td>
</tr>
</tbody>
</table>

*Note. N = 181; SHAI = Short Health Anxiety Index; CTQ = Childhood Trauma Questionnaire; DERS = Difficulties in Emotion Regulation Scale; ECRR = Experience in Close Relationships – Revised Questionnaire; AN = attachment anxiety; AV = attachment avoidance; CESD-R = Center for Epidemiologic Studies Depression Scale – Revised; ASI = Anxiety Sensitivity Index; STAI-T = State-Trait Anxiety Inventory - Trait Form.*
Table 4

*Sex Differences across the Measures of Interest*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Male(^a)</th>
<th>Female(^b)</th>
<th>(t)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(M (SD))</td>
<td>(M (SD))</td>
<td></td>
</tr>
<tr>
<td>SHAI</td>
<td>10.08 (6.02)</td>
<td>12.86 (6.04)</td>
<td>2.52*</td>
</tr>
<tr>
<td>CTQ</td>
<td>35.82 (9.19)</td>
<td>41.54 (15.28)</td>
<td>2.92**</td>
</tr>
<tr>
<td>- Emotional Abuse</td>
<td>8.08 (2.65)</td>
<td>11.08 (5.76)</td>
<td>4.64***</td>
</tr>
<tr>
<td>- Physical Abuse</td>
<td>7.03 (2.95)</td>
<td>6.61 (2.84)</td>
<td>0.80</td>
</tr>
<tr>
<td>- Sexual Abuse</td>
<td>5.53 (2.45)</td>
<td>6.50 (3.85)</td>
<td>1.91</td>
</tr>
<tr>
<td>- Emotional Neglect</td>
<td>8.74 (3.40)</td>
<td>10.50 (4.89)</td>
<td>2.57*</td>
</tr>
<tr>
<td>- Physical Neglect</td>
<td>6.39 (2.42)</td>
<td>6.75 (2.57)</td>
<td>0.76</td>
</tr>
<tr>
<td>DERS</td>
<td>78.84 (20.43)</td>
<td>82.41 (23.12)</td>
<td>0.87</td>
</tr>
<tr>
<td>ECRR-AN</td>
<td>58.63 (19.99)</td>
<td>64.57 (22.33)</td>
<td>1.49</td>
</tr>
<tr>
<td>ECRR-AV</td>
<td>71.55 (17.29)</td>
<td>71.98 (23.19)</td>
<td>0.13</td>
</tr>
<tr>
<td>CESD-R</td>
<td>13.74 (13.72)</td>
<td>16.52 (14.08)</td>
<td>1.09</td>
</tr>
<tr>
<td>ASI-3</td>
<td>13.87 (9.71)</td>
<td>15.53 (11.77)</td>
<td>0.80</td>
</tr>
<tr>
<td>STAI-T</td>
<td>39.21 (9.98)</td>
<td>43.69 (12.13)</td>
<td>2.10*</td>
</tr>
</tbody>
</table>

*Note.* SHAI = Short Health Anxiety Index; CTQ = Childhood Trauma Questionnaire; DERS = Difficulties in Emotion Regulation Scale; ECRR = Experiences in Close Relationships - Revised Questionnaire; AN = attachment anxiety; AV = attachment avoidance; CESD-R = Center for Epidemiologic Studies Depression Scale - Revised; ASI = Anxiety Sensitivity Index; STAI-T = State-Trait Anxiety Inventory - Trait Form.

\(^a\)\(n = 38\). \(^b\)\(n = 143\).

\(*p < .05. **p < .01. ***p < .001.\)
3.2.2 Childhood abuse history. During the pre-screen process, students were queried about five different categories of childhood abuse. For the definitions of childhood abuse and for the reported prevalence rates of the types of childhood abuse reported by the overall pre-screened sample ($N = 510$) refer to Table 5. The participants completed the same Pre-Screen Questionnaire during the full survey. Of the 181 participants, 104 of them endorsed at least one category of childhood abuse according the Pre-Screen Questionnaire. See Figure 2 for the distribution of total childhood abuse categories endorsed by the overall sample. Since participants were pre-screened for childhood abuse, the following prevalence and severity of these experiences cannot be generalized to a non-screened population. Among these participants ($N = 181$), emotional abuse was the most commonly reported type of abuse with 67.3% ($n = 70$) of those with a childhood abuse history endorsing this category. Emotional neglect was the next most frequently endorsed category ($n = 60; 57.7$%), followed by physical abuse ($n = 49; 47.1$%), sexual abuse ($n = 26; 25.0$%), and physical neglect ($n = 20; 19.2$%). For a summary of the reported childhood abuse categories by sex and for the overall sample refer to Table 6. Participants who endorsed at least one category of childhood abuse on the Pre-Screen Questionnaire ($n = 104$) were asked to report the age of onset (i.e., how old they were in years when they experienced their first childhood abuse experience) and the duration of childhood abuse in years (i.e., how many total years of childhood abuse were experienced). Approximately 87% of respondents who endorsed a history of childhood abuse provided the age of onset ($n = 90$), which ranged from birth to 17 years of age [$M_{age} = 8.28$ years ($SD = 4.60$)]. The reported duration of abuse experiences ($n = 87$) ranged from one to 18 years [$M_{age} = 6.75$ years ($SD = 4.77$)].
Table 5  
Definition and Prevalence of Childhood Abuse Categories for the Pre-Screened Sample

<table>
<thead>
<tr>
<th>Category</th>
<th>%</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional abuse</td>
<td>26.7</td>
<td>136</td>
</tr>
</tbody>
</table>
| (Did a parent or other adult in the household…)
| 1. Often or very often swear at you, insult you, put you down, or humiliate you? |
| 2. Often or very often act in a way that made you afraid that you might be physically hurt? |
| Physical abuse        | 19.6| 100|
| (Did a parent or other adult in the household…)
| 1. Often or very often push, grab, slap, or throw something at you? |
| 2. Ever hit you so hard that you had marks or were injured? |
| Sexual abuse          | 8.0 | 41 |
| (Did an adult or person at least 5 years older than you…)
| 1. Ever touch or fondle you or have you touch their body in a sexual way? |
| 2. Ever attempt or actually have oral, anal, or vaginal intercourse with you? |
| Emotional neglect     | 23.9| 122|
| 1. Did you often or very often feel that no one in your family loved you or thought you were important or special? |
| 2. Did you often or very often feel that your family didn't look out for each other, feel close to each other, or support each other? |
| Physical neglect      | 5.7 | 29 |
| 1. Did you often or very often feel that you didn't have enough to eat, had to wear dirty clothes, and had no one to protect you? |
| 2. Did you often or very often feel that your parents were too drunk or high to take care of you or take you to the doctor if you needed it? |

*Note. N = 510.*
**Figure 2**

*Distribution of Total Abuse Categories Endorsed*

![Bar Chart]

**Note.** $N = 181$. 
Table 6

*Prevalence of Childhood Abuse Categories for the Full Study Sample*

<table>
<thead>
<tr>
<th>Category</th>
<th>Male(^a)</th>
<th>Female(^b)</th>
<th>Total(^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional abuse</td>
<td>9 (23.7)</td>
<td>61 (42.7)</td>
<td>70 (38.7)</td>
</tr>
<tr>
<td>Physical abuse</td>
<td>10 (26.3)</td>
<td>39 (27.3)</td>
<td>49 (27.1)</td>
</tr>
<tr>
<td>Sexual abuse</td>
<td>2 (5.3)</td>
<td>24 (16.8)</td>
<td>26 (14.4)</td>
</tr>
<tr>
<td>Emotional neglect</td>
<td>6 (15.8)</td>
<td>54 (37.8)</td>
<td>60 (33.1)</td>
</tr>
<tr>
<td>Physical neglect</td>
<td>5 (13.2)</td>
<td>15 (10.5)</td>
<td>20 (11.0)</td>
</tr>
</tbody>
</table>

\(^a n = 38. \quad ^b n = 143. \quad ^c N = 181.\)
In addition to the Pre-Screen Questionnaire, respondents completed the CTQ as a more detailed measure of childhood abuse experiences. One of the advantages of the CTQ is that it allows for childhood maltreatment to be measured on a continuum, rather than categorically, which provides additional information regarding the severity of abuse experiences. Bernstein and Fink (1998) provide recommended cut-off scores for each abuse type that yield four classifications of abuse severity: None to Minimal, Low to Moderate, Moderate to Severe, and Severe to Extreme. See Table 7 for the frequency of types of childhood abuse for the overall sample as measured by the CTQ.
Table 7

*Frequency of Types of Childhood Abuse Using the Childhood Trauma Questionnaire*

<table>
<thead>
<tr>
<th>Type of abuse</th>
<th>None to Minimal</th>
<th>Low to Moderate</th>
<th>Moderate to Severe</th>
<th>Severe to Extreme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional abuse</td>
<td>93 (51.4)</td>
<td>32 (17.7)</td>
<td>19 (10.5)</td>
<td>37 (20.4)</td>
</tr>
<tr>
<td>Physical abuse</td>
<td>139 (76.8)</td>
<td>14 (7.7)</td>
<td>13 (7.2)</td>
<td>15 (8.3)</td>
</tr>
<tr>
<td>Sexual abuse</td>
<td>148 (81.8)</td>
<td>10 (5.5)</td>
<td>9 (5.0)</td>
<td>14 (7.7)</td>
</tr>
<tr>
<td>Emotional neglect</td>
<td>98 (54.1)</td>
<td>44 (24.3)</td>
<td>25 (13.8)</td>
<td>14 (7.7)</td>
</tr>
<tr>
<td>Physical neglect</td>
<td>139 (76.8)</td>
<td>20 (11.0)</td>
<td>13 (7.2)</td>
<td>9 (5.0)</td>
</tr>
</tbody>
</table>

*Note. N = 181.*
3.3 Relationships between Health Anxiety, Childhood Abuse, and Associated Constructs

Hypothesis 1 stated that there would be significant, positive associations between health anxiety, childhood abuse history, and the associated constructs. To test this hypothesis, bivariate correlations were computed between the SHAI, CTQ, DERS, ECRR-AN, ECRR-AV, CESD-R, ASI-3, and STAI-T (see Table 8). Analysis revealed a statistically significant association between SHAI scores and CTQ total scores, \( r(179) = .352, p < .001 \). The SHAI also demonstrated statistically significant associations with the CTQ emotional abuse subscale, \( r(179) = .325, p < .001 \), sexual abuse subscale, \( r(179) = .244, p = .001 \), emotional neglect subscale, \( r(179) = .319, p < .001 \), and physical neglect subscale, \( r(179) = .208, p = .005 \). The physical abuse subscale did not demonstrate a statistically significant relationship with the SHAI with the dataset as is; however, as previously noted, non-normal distributions were transformed during the preliminary examination of the dataset. The transformed data did not significantly influence the statistical outcomes of the research analyses, with the exception of one relationship. When the transformed data was analyzed, in contrast to the original data, the results revealed a statistically significant relationship between SHAI scores and the CTQ physical abuse subscale, \( r(179) = .158, p = .033 \). In an additional correlation analysis intended to provide further information about the relationship between health anxiety and childhood abuse experiences, the SHAI did not demonstrate a statistically significant relationship with duration of childhood abuse, \( r(85) = .167, p = .121 \), or the age of abuse onset, \( r(88) = -.005, p = .962 \), in those who endorsed a childhood abuse history \( (n = 104) \).
Table 8

Summary of Correlations among Measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>1</th>
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<tr>
<td>1. SHAI</td>
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<tr>
<td>2. CTQ</td>
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<td>.35**</td>
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<td>.90**</td>
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<td>4. Phys. Abuse</td>
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<td>.11</td>
<td>.64**</td>
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<td>5. Sex. Abuse</td>
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<td>.24**</td>
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<td>7. Phys. Neglect</td>
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<td>.43**</td>
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<td>.53**</td>
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<td>8. DERS</td>
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<td>.36**</td>
<td>.44**</td>
<td>.46**</td>
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<td>10. ECRR-AV</td>
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<td>.45**</td>
<td>.45**</td>
<td>.44**</td>
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<td>12. ASI-3</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>.49**</td>
<td>.40**</td>
</tr>
<tr>
<td>13. STAI-T</td>
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<td></td>
<td></td>
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<td></td>
<td>.49**</td>
</tr>
</tbody>
</table>

Note. N = 181; SHAI = Short Health Anxiety Index; CTQ = Childhood Trauma Questionnaire; Em. = Emotional; Phys. = Physical; Sex. = Sexual; DERS = Difficulties in Emotion Regulation Scale; ECRR = Experiences in Close Relationships – Revised Questionnaire; AN = attachment anxiety; AV = attachment avoidance; CESD-R = Center for Epidemiologic Studies Depression Scale – Revised; ASI = Anxiety Sensitivity Index; STAI-T = State-Trait Anxiety Inventory - Trait Form.

*p < .05. **p < .01.
The associated constructs of particular interest – emotion dysregulation and attachment orientation – also demonstrated significant associations with health anxiety and childhood abuse. In particular, the DERS demonstrated an association with the SHAI, \( r(179) = .387, p < .001 \), and the CTQ total score, \( r(179) = .415, p < .001 \). Anxious attachment also demonstrated an association with the SHAI \( r(179) = .357, p < .001 \), and the CTQ total score, \( r(179) = .443, p < .001 \). Avoidant attachment did not demonstrate a significant relationship with SHAI scores, \( r(179) = .115, p = .123 \), but did reveal a relationship with CTQ scores, \( r(179) = .337, p < .001 \).

Our secondary research hypotheses theorized about the associated constructs, specifically. One of the secondary hypotheses stated that history of childhood abuse would demonstrate significant, positive associations with measures of anxiety, depression, and anxiety sensitivity. To test this hypothesis, the correlation coefficients for each relationship were examined. The findings revealed support for this hypothesis as the CTQ demonstrated statistically significant \((p < .001)\), positive relationships with the STAI-T \((r = .42)\), the CEDS-R \((r = .45)\), and the ASI-3 \((r = .40)\).

Another secondary hypotheses stated that particular associated constructs (i.e., anxiety, depression, and anxiety sensitivity) would demonstrate stronger relationships with health anxiety compared to childhood abuse experiences. To test this hypothesis, the associations were statistically compared using Steiger’s Z-test for comparing correlation coefficients (Steiger, 1980), which demonstrated partial support for this hypothesis. The relationship between the SHAI and the CTQ \((r = .35)\) was not statistically different from the relationship between the SHAI and the CESD \((r = .45)\), \( z = 1.43, p = .154 \), or the SHAI and the ASI \((r = .49)\), \( z = 1.95, p = .052 \). Although, there
was a significant difference when comparing the relationship between the SHAI and the CTQ ($r = .35$) and the SHAI and the STAI-T ($r = .49$), $z = 1.98, p = .048$. These results provide partial support for our hypothesis indicating that the relationship between the SHAI and the STAI-T was significantly stronger than the relationship between the SHAI and the CTQ.

### 3.4 Testing a Predictive Model of Health Anxiety

Hypothesis 2 stated that childhood abuse experiences and the associated constructs would be predictive of health anxiety. To test this hypothesis, a hierarchical multiple regression was conducted in order to evaluate if childhood abuse and the associated constructs would demonstrate utility in predicting health anxiety in adulthood. Prior to the regression analysis, multicollinearity was assessed among the predictor variables and was not problematic within this dataset, as none of the variables were very highly correlated ($r > .80$; Field, 2009). Further examination of the data demonstrated that the assumptions of linearity and homoscedasticity were both met.

In order to determine which variables would significantly contribute in a model to predict health anxiety, a multiple linear regression was initially conducted to examine the contribution of background variables only. The background variables included age, sex, ethnicity (i.e., Caucasian vs. non-Caucasian), current medical condition (present vs. absent), and childhood medical condition or serious injury (present vs. absent). These variables did not demonstrate predictive utility, $F(5, 175) = 2.19, p = .057$, and were therefore excluded from the main regression analysis. A hierarchical multiple regression was then conducted to evaluate if childhood abuse experiences and the associated constructs were predictive of health anxiety. The ECR-R-AV was excluded from the
analysis, as it did not demonstrate a statistically significant relationship with the SHAI (the dependent variable) in the correlation analysis. The CTQ was entered into the first step, using forced entry, in order to examine the unique contribution of childhood abuse independent of the additional variables, as well as to reflect the theoretically driven temporal association between the childhood abuse experiences and the remaining constructs of interest (i.e., assuming that the childhood abuse occurred earliest in order). The CTQ demonstrated a statistically significant contribution and explained 12.4% of the variance in health anxiety, \( F(1, 179) = 25.30, p < .001 \). The DERS and the ECR-R-AV were entered into the second step, using forced entry, in order to examine the contribution of these associated constructs while controlling for childhood abuse. These measures were entered into the second step because attachment orientation is thought to develop in childhood (e.g., Bowlby, 1969), theoretically preceding the other constructs of interest and emotion regulation has been found to mediate the relationship between childhood maltreatment and internalizing problems (i.e., symptoms of anxiety and depression; Alink et al., 2009). This model demonstrated a statistically significant contribution and explained 20.2% of the variance in health anxiety, \( F(3, 177) = 14.92, p < .001 \). The CTQ continued to be a statistically significant predictor (\( \beta = .206, p = .008 \)), as well as the DERS (\( \beta = .223, p = .014 \)). The addition of the second step added increased significant variance from step 1, \( \Delta F(2, 177) = 8.64, p < .001 \). The remaining variables including the STAI-T, CESD-R, and ASI-3 were entered into the third and final step, also using forced entry, and the model indicated that the amount of variance accounted for in the SHAI was now 31.9%, and the regression model as a whole was statistically significant, \( F(6, 174) = 13.57, p < .001 \). The two statistically significant
predictors were the ASI-3 total score ($\beta = .273, p = .001$) and the STAI-T total score ($\beta = .299, p = .013$). The change from step 2 to step 3 was statistically significant, $\Delta F (3, 174) = 9.96, p < .001$. The CTQ was no longer a statistically significant predictor in the overall model. These results suggest that independently the CTQ was a significant predictor of health anxiety; however, following the inclusion of additional associated constructs in the analysis, the CTQ was no longer a predicting variable. See Table 9 for a summary of the regression models.
Table 9

Predictors of Health Anxiety

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B (SE)</th>
<th>Beta</th>
<th>p</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>6.23 (1.28)</td>
<td>0.35***</td>
<td>&lt; .001</td>
<td>0.35***</td>
</tr>
<tr>
<td>CTQ</td>
<td>0.15 (.03)</td>
<td>0.35***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>1.67 (1.66)</td>
<td>0.21**</td>
<td>.008</td>
<td>0.35***</td>
</tr>
<tr>
<td>CTQ</td>
<td>0.09 (0.03)</td>
<td>0.12</td>
<td>.191</td>
<td>0.36***</td>
</tr>
<tr>
<td>ECR-R-AN</td>
<td>0.03 (0.03)</td>
<td>0.22**</td>
<td>.014</td>
<td>0.39***</td>
</tr>
<tr>
<td>DERS</td>
<td>0.06 (0.02)</td>
<td>0.13</td>
<td>.080</td>
<td>0.35***</td>
</tr>
<tr>
<td>Model (Final)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>3.67 (2.08)</td>
<td>0.13</td>
<td>.080</td>
<td>0.35***</td>
</tr>
<tr>
<td>CTQ</td>
<td>0.06 (0.03)</td>
<td>0.13</td>
<td>.080</td>
<td>0.35***</td>
</tr>
<tr>
<td>ECR-R-AN</td>
<td>-0.01 (0.03)</td>
<td>-0.02</td>
<td>.816</td>
<td>0.36***</td>
</tr>
<tr>
<td>DERS</td>
<td>-0.04 (0.03)</td>
<td>-0.13</td>
<td>.257</td>
<td>0.39***</td>
</tr>
<tr>
<td>STAI-T</td>
<td>0.16 (0.06)</td>
<td>0.30**</td>
<td>.13</td>
<td>0.49***</td>
</tr>
<tr>
<td>CESD-R</td>
<td>0.05 (0.05)</td>
<td>0.11</td>
<td>.289</td>
<td>0.45***</td>
</tr>
<tr>
<td>ASI-3</td>
<td>0.15 (0.05)</td>
<td>0.27**</td>
<td>.001</td>
<td>0.49***</td>
</tr>
</tbody>
</table>

Note. N = 181. CTQ = Childhood Trauma Questionnaire; ECR-R-AN = Experiences in Close Relationships – Revised Questionnaire – Attachment Anxiety; DERS = Difficulties in Emotion Regulation Scale; STAI-T = State-Trait Anxiety Inventory - Trait Form; CESD-R = Center for Epidemiologic Studies Depression Scale – Revised; ASI = Anxiety Sensitivity Index; r = Pearson correlation with health anxiety. ** p < .01 ***p < .001.
Although the correlation coefficients between the predictor variables entered into the regression were not greater than .80, it was possible that variables that were highly correlated ($r > .70$) could make it difficult to evaluate the individual contributions of each variable. It is important to note that a number of the strong associations in the correlation matrix (see Table 8) were between subscales of the CTQ or between a CTQ subscale and the CTQ total score; these high correlations were expected and were not considered in the following analysis of highly correlated variables. To be sure that strong correlations (excluding those between the CTQ total score and subscales) were not concealing the unique contribution of one of the variables, the abovementioned multiple regression analysis was re-conducted twice with minor modifications to ensure that a significant relationship had not been disguised. One regression was conducted excluding the DERS to examine the effect on the CESD-R (as the correlation coefficient between these two variables was .74). Another regression was conducted excluding the STAI-T also to examine the effect on the CESD-R ($r = .75$) and the DERS ($r = .80$). Excluding these variables did not have a significant impact on the variables of interest in the overall model (i.e., the CESD-R and the DERS were not revealed as unique predictors in the overall model following the exclusion of highly correlated variables). These subsequent analyses confirm that multicollinearity was not a problem with the current dataset.
3.5 Testing a Model of Childhood Abuse, Emotion Dysregulation, and Health Anxiety

Hypothesis 3 stated that emotion regulation would mediate the relationship between childhood abuse and health anxiety. To test this hypothesis, mediation analysis was conducted. The most common procedure for mediation analysis in psychological research is the Baron and Kenny (1986) method (Preacher & Hayes, 2004). Despite its popularity, this procedure lacks formal testing of statistical significance for indirect effects to avoid Type I and Type II error. As a result, the Baron and Kenny (1986) method displays low statistical power in numerous situations (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). Therefore, in the current research, mediation was analyzed using a SPSS macro developed by Preacher and Hayes (2004). Contrary to the Baron and Kenny (1986) method, the Preacher and Hayes (2004) macro formally tests the statistical significance of indirect effects parametrically and non-parametrically by employing the Sobel test and a bootstrapping procedure, respectively. The Preacher and Hayes (2004) procedure also provides the output necessary to evaluate mediation using the Baron and Kenny (1986) criteria, which the current investigation employed.

Utilizing Baron and Kenny’s criteria, the results indicated that the total effect of childhood abuse ($\beta = .15$) on health anxiety (as measured by the SHAI) was statistically significant ($p < .001$). This finding suggests that more severe childhood abuse experiences are found among those with elevated levels of health anxiety (see Figure 3). The effect of childhood abuse ($\beta = .65$) on emotion dysregulation (the mediating variable; as measured by the DERS) was also statistically significant ($p < .001$). Accordingly, more severe childhood abuse experiences are reported among those with
increased emotion dysregulation. The effect of emotion dysregulation ($\beta = .08$) on health anxiety, when controlling for childhood abuse, was also statistically significant ($p < .001$), indicating that those with relatively higher emotion dysregulation were more likely to have elevated levels of health anxiety while controlling for childhood abuse. Lastly, the direct effect of childhood abuse ($\beta = .10$) on health anxiety, when controlling for emotion dysregulation, was statistically significant ($p < .01$), demonstrating that when controlling for emotion dysregulation, there is still a statistically significant relationship between childhood abuse and health anxiety (see Figure 4), indicating that emotion dysregulation did not fully mediate the effect of childhood abuse on health anxiety. For a full mediation to occur, the direct effect of childhood abuse on health anxiety, when controlling for emotion dysregulation, would no longer be statistically significant, emphasizing the importance of emotion dysregulation on the path from childhood abuse to health anxiety.
Figure 3. Direct effect of childhood abuse on health anxiety in adulthood.

***p < .001.
Figure 4. Childhood abuse affecting health anxiety indirectly through emotion dysregulation.

***p < .001.
The Preacher and Hayes (2004) procedure allows for the formal testing of the statistical significance of indirect effects parametrically and non-parametrically. To test the indirect effect parametrically, Sobel’s test (Sobel, 1982) was employed and the results indicated that the mediated effect had dropped substantially and therefore emotion dysregulation partially mediated the relationship between childhood abuse and health anxiety in adulthood, $z = 3.28$, $p = .001$. To test the statistical significance of the indirect effect non-parametrically, a bootstrapping procedure was employed. The bootstrapped estimate of the true indirect effect was estimated to lie between .0243 and .0852 with 95% confidence intervals. Because zero is not in the 95% confidence interval, it can be concluded that the indirect effect is different from zero at $p < .05$ (two-tailed). Overall, the results of the three mediation analyses provide support that the relationship between childhood abuse and health anxiety was partially mediated by emotion dysregulation.

### 3.6 Testing a Model of Childhood Abuse, Attachment, and Health Anxiety

Hypothesis 4 stated that insecure attachment styles would also play a mediating role in the relationship between childhood abuse and health anxiety. To test this hypothesis, a second mediation analysis was conducted employing the Preacher and Hayes (2004) procedure. Utilizing Baron and Kenny’s criteria, the results reiterated that the total effect of childhood abuse ($\beta = .15$) on health anxiety (as measured by the SHAI) was statistically significant ($p < .001$; see Figure 3). The effect of childhood abuse ($\beta = .68$) on anxious attachment (the mediating variable; as measured by the ECR-R-AN) was also statistically significant ($p < .001$), indicating more severe childhood abuse among those with relatively higher levels of anxious attachment. The effect of anxious
attachment ($\beta = .07$) on health anxiety, when controlling for childhood abuse, was also statistically significant ($p < .01$), suggesting that participants with relatively high anxious attachment were more likely to have elevated health anxiety while controlling for childhood abuse. Lastly, the direct effect of childhood abuse ($\beta = .10$) on health anxiety, when controlling for anxious attachment, was statistically significant ($p < .01$), demonstrating that when controlling for anxious attachment there is still a statistically significant relationship between childhood abuse and health anxiety (see Figure 5), indicating that anxious attachment did not fully mediate the effect of childhood abuse on health anxiety.
Figure 5. Childhood abuse affecting health anxiety indirectly through anxious attachment.

***p < .001.
However, the Sobel test demonstrated the mediated effect had dropped significantly, \( z = 2.92, p = .004 \), and that anxious attachment partially mediated the relationship between childhood abuse and health anxiety. Lastly, the bootstrapped estimate of the true indirect effect was estimated to lie between .0197 and .0810 with 95% confidence intervals, indicating that the indirect effect is different from zero at \( p < .05 \) (two-tailed). Overall, these three mediation analyses indicate that anxious attachment was also a partial mediator in the relationship between childhood abuse and adult health anxiety.

A third mediation analysis was conducted to examine the potential mediating role of avoidant attachment in the relationship between childhood abuse and health anxiety. Utilizing Baron and Kenny’s criteria, the results reiterated that the total effect of childhood abuse (\( \beta = .15 \)) on health anxiety (as measured by the SHAI) was statistically significant (\( p < .001 \); see Figure 3). The effect of childhood abuse (\( \beta = .52 \)) on avoidant attachment (the mediating variable; as measured by the ECR-R-AV) was also statistically significant (\( p < .001 \)), indicating more severe childhood abuse among those with relatively higher levels of avoidant attachment. The effect of avoidant attachment (\( \beta = -.001 \)) on health anxiety, when controlling for childhood abuse, was not statistically significant (\( p = .96 \)), suggesting that participants high in avoidant attachment were not more likely to have elevated health anxiety when controlling for childhood abuse. Avoidant attachment did not predict health anxiety in this model and therefore this model is a failure for mediation. Lastly, the direct effect of childhood abuse (\( \beta = .15 \)) on health anxiety, when controlling for avoidant attachment, was statistically significant (\( p < .001 \)), demonstrating that when controlling for avoidant attachment, the relationship
between childhood abuse and health anxiety does not change (see Figure 6). These results indicate that avoidant attachment does not mediate the effect of childhood abuse on health anxiety.

The results of the Sobel test were not statistically significant and confirmed that avoidant attachment does not play a mediating role in the relationship between childhood abuse and health anxiety, \( z = -0.05, p = .96 \). Lastly, the bootstrapped estimate of the true indirect effect was estimated to lie between \(-0.0220\) and \(0.0208\) with 95\% confidence intervals. Because zero is in the 95\% confidence interval, it can be concluded that the indirect effect does not differ from zero at \( p < .05 \) (two-tailed) and therefore also does not support the mediating role of avoidant attachment. Overall, these three mediation analyses indicated that avoidant attachment was not a mediator in the relationship between childhood abuse and adult health anxiety.
**Figure 6.** Childhood abuse affecting health anxiety indirectly through avoidant attachment.

***p < .001.
3.7 Testing a Model of Childhood Abuse, Anxiety Sensitivity, and Health Anxiety

The last of the secondary hypotheses stated that anxiety sensitivity would play a mediating role in the relationship between childhood abuse and health anxiety. To test this hypothesis, a fourth mediation analysis was conducted to examine the potential mediating role of anxiety sensitivity in the relationship between childhood abuse and health anxiety in adulthood. Utilizing Baron and Kenny’s criteria, the results reiterated that the total effect of childhood abuse ($\beta = .15$) on health anxiety (as measured by the SHAI) was statistically significant ($p < .001$; see Figure 3). The effect of childhood abuse ($\beta = .32$) on anxiety sensitivity (the mediating variable; as measured by the ASI-3) was also statistically significant ($p < .001$), indicating more severe childhood abuse among those with elevated levels of anxiety sensitivity. The effect of anxiety sensitivity ($\beta = .23$) on health anxiety, when controlling for childhood abuse, was also statistically significant ($p < .001$), suggesting that participants with relatively high anxiety sensitivity were more likely to have elevated health anxiety while controlling for childhood abuse. Lastly, the direct effect of childhood abuse ($\beta = .08$) on health anxiety, when controlling for anxiety sensitivity, remained statistically significant ($p = .01$), demonstrating that when controlling for anxiety sensitivity, there is still a statistically significant relationship between childhood abuse and health anxiety (see Figure 7). These results indicate that anxiety sensitivity does not fully mediate the effect of childhood abuse on health anxiety.

The Sobel test demonstrated that the mediated effect had dropped significantly, $z = 4.18$, $p < .001$, indicating that anxiety sensitivity played a partial mediating role in the relationship between childhood abuse and health anxiety. Lastly, the bootstrapped
estimate of the true indirect effect was estimated to lie between .0408 and .1126 with 95% confidence intervals, indicating that the indirect effect is different from zero at \( p < .05 \) (two-tailed), corroborating the findings from the Sobel test. Overall, these three mediation analyses indicate that anxiety sensitivity was also a partial mediator in the relationship between childhood abuse and adult health anxiety.
Figure 7. Childhood Abuse affecting health anxiety indirectly through anxiety sensitivity.

***$p < .001$. 

$\alpha = .32^{***}$

$b = .23^{***}$

$c' = .08^{**}$
4.0 Discussion

The purpose of the current study was to examine levels of health anxiety in adults who have a history of childhood physical, sexual, and/or emotional abuse (including neglect), and to investigate the roles of emotion regulation and attachment in this relationship. The primary objectives of the research were fourfold: (1) to explore the relationships between childhood abuse, health anxiety, and the associated constructs (i.e., emotion regulation, attachment orientation, anxiety, depression, and anxiety sensitivity); (2) to investigate the utility of childhood abuse experiences and the associated constructs in predicting health anxiety; (3) to examine the possible mediating role of emotion regulation in the relationship between childhood abuse and health anxiety in adulthood; and (4) to examine the possible mediating role of attachment in the relationship between childhood abuse and health anxiety in adulthood.

To address the aforementioned study objectives an assessment battery comprised of self-report measures of childhood abuse types and severity, level of health anxiety, emotion regulation, attachment orientation, general anxiety, depressive symptomatology, and anxiety sensitivity was administered to a pre-screened sample of 181 young adults. The study findings and how they relate to the extant literature are discussed. Following, we will examine the study strengths and limitations and offer recommendations for future research in this area. To conclude, the scientific and clinical implications of this research are considered.

4.1 Prevalence of Childhood Abuse History

Of the 510 students that were pre-screened for participation in this research, a total of 213 students (41.8%) endorsed at least one of the five categories of childhood
abuse. This is similar to the prevalence rates of studies examining university populations. For example, McGavock and Spratt (2012) found that 56.0% of participants within a university sample endorsed at least one category of adverse childhood experiences, which included the same five categories utilized in the current study. However, this study also included additional categories of household dysfunction (i.e., parental separation or divorce, violent treatment towards the mother, substance abuse in the home, mentally ill or suicidal household member, and incarcerated household member), which likely accounts for the increase in prevalence relative to the current study. Of the 104 students who endorsed at least one category of childhood abuse and participated in the full study, emotional abuse was the most commonly reported childhood abuse experience, endorsed by 38.7% of the respondents, followed by emotional neglect (33.1%), physical abuse (27.1%), sexual abuse (14.4%), and physical neglect (7%). A number of these participants endorsed only one type of childhood abuse experience (36.5%), while others endorsed two types (24.0%), three types (28.8%), four types (7.7%), or all five types (2.9%). Over 60% of the participants who endorsed a history of childhood abuse reported exposure to more than one type of abuse. The recent literature on childhood maltreatment has increasingly focused on the impact of more than one type of abuse and suggests that co-occurrence of multiple forms of childhood abuse is common (e.g., Dong et al., 2004). Participants who endorsed a history of childhood abuse reported that the age of onset ranged from birth to 17 years of age (with an average age of approximately eight years) and that the duration of abuse ranged from one to 18 years (with an average age of nearly seven years). This is consistent with previous research that examined childhood abuse and neglect history in adolescents and young
adults \((N = 103; \text{ages 13-19 years})\) and found the mean age of onset of severe childhood abuse and/or neglect was 6.8 years and a mean duration of 6.38 years (Harkness, Bruce, & Lumley, 2006).

### 4.2 Relationships between Childhood Abuse, Health Anxiety, and Associated Constructs

Based on previous research (e.g., Barsky et al., 1994; Noyes et al., 2002; Salmon & Calderbank, 1996), we hypothesized that there would be significant associations between health anxiety, childhood abuse experiences, and the associated constructs (i.e., emotion regulation, attachment orientation, anxiety, depression, and anxiety sensitivity). Consistent with this hypothesis, we found significant associations between childhood abuse, health anxiety, and the constructs of interest. More specifically, associations were observed between childhood abuse and the associated constructs, with more severe childhood abuse experiences related to higher levels of emotion dysregulation, anxious attachment, avoidant attachment, anxiety, depression, and anxiety sensitivity. These findings are consistent with previous research that has demonstrated an association between childhood maltreatment and both emotion dysregulation (e.g., Alink et al., 2009) and insecure attachment (e.g., Muller et al., 2000; Toth & Cicchetti, 1996; Stalker & Davies, 1995; Styron & Janoff-Bulman, 1997). Our secondary hypothesis, which stated that childhood abuse would demonstrate significant, positive associations with measures of anxiety, depression, and anxiety sensitivity, was also supported with the current findings. Childhood maltreatment has also been linked to anxiety (e.g., Gibb et al., 2007; MacMillan et al., 2001; Mancini, et al., 1995), depression (e.g., Chapman et al., 2004), and anxiety sensitivity (e.g., Scher & Stein, 2003) in previous research.
Health anxiety also demonstrated significant, positive relationships with the associated constructs, indicating that as levels of health anxiety increased, levels of emotion dysregulation, anxious attachment, anxiety, depression, and anxiety sensitivity also increased. The current study is the first empirical study of the relationship between health anxiety and overall emotion regulation abilities, expanding the limited research in this area, which previously focused solely on emotion regulation strategies (Fergus & Valentiner, 2010; Görgen et al., 2013). Previous research has found increased emotion dysregulation among those with general anxiety (e.g., Amstadter, 2008; Mennin et al., 2005; Orgeta, 2011); however, the current study is the first to provide support for a positive relationship between general emotion dysregulation and health anxiety, specifically. Health anxiety and avoidant attachment did not demonstrate a significant association. The finding that health anxiety is associated with anxious attachment and not avoidant attachment is consistent with Hunter and Maunder’s (2001) theory that anxious attachment would be related to health anxiety and associated behaviours, and is also consistent with previous research. For example, a preoccupied attachment style (i.e., a categorization high in attachment anxiety) has been linked to the highest medical care utilization, at the highest cost, compared to patients with other attachment styles (Ciechanowski et al., 2002). Similarly, Schmidt and colleagues (2002) found that elevated levels of health anxiety were associated with two anxious attachment styles. In addition, Wearden and colleagues (2006) found that anxious attachment orientation related to higher scores of hypochondriasis compared to those with other attachment styles. Akin to the current findings, health anxiety has also been associated with
increased levels of general anxiety (e.g., Barsky et al., 1992), depression (e.g., Noyes et al., 1994), and anxiety sensitivity (e.g., Abramowitz et al., 2007; Stewart & Watt, 2000).

Of particular interest was the relationship between childhood abuse experiences and health anxiety in adulthood, which also revealed a significant, positive association indicating that as the severity of the overall childhood abuse increased, levels of health anxiety also increased. These variables demonstrated a moderately strong relationship (Cohen, 1988). This is consistent with previous research that has found significant relationships between childhood maltreatment and elevated levels of health anxiety in adulthood (Barsky et al., 1994; Salmon & Calderbank, 1996). This finding adds to the existing literature by clarifying the relationship between these experiences, as some research has not found a relationship between childhood abuse and health anxiety in adulthood (i.e., Noyes et al., 2002). It is possible that Noyes and colleagues (2002) did not find an increase in childhood sexual and physical abuse in those with severe health anxiety because their study utilized a six-item self-report questionnaire that only included one question each to examine history of childhood physical and sexual abuse. Notably, Barsky and colleagues (1994) utilized the same measure and found a significant increase in childhood physical and sexual abuse among a similar sample of individuals with severe health anxiety. The discrepancies in these findings warranted the further examination of the impact of childhood abuse with a more detailed and specific inquiry of abusive childhood events.

The current study also adds to the existing research by examining the relationship between levels of health anxiety and the severity of five categories of childhood abuse – emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect.
Health anxiety demonstrated a significant, positive association with all five types of abuse (note: health anxiety and physical abuse demonstrated a significant association with the transformed variables only). Health anxiety research (and research in general) has typically focused on the impact of physical and sexual forms of abuse, only, and has not investigated the impacts of emotional abuse and neglect. The current findings emphasize the importance of considering emotional abuse and neglect in childhood, as these experiences have demonstrated a significant relationship with health anxiety in adulthood. These findings are consistent with previous research that suggests that these forms of maltreatment, independently, can have a significant impact on functioning in adulthood (e.g., Ferguson & Dacey, 1997; Spertus et al., 2003). Barnett and colleagues (2005) suggest that emotional abuse may be among the most prevalent and damaging forms of childhood abuse; this is consistent with the current findings, which found that emotional abuse was the most commonly endorsed childhood abuse experience among a sample of 510 undergraduate students (26.7%) and that relative to the other categories of childhood maltreatment, emotional abuse demonstrated the strongest association with health anxiety in the full study. It is also important to include emotional abuse and neglect when investigating the impact of childhood maltreatment because these forms of abuse often co-occur with physical and sexual abuse (Claussen & Crittenden, 1991; Higgins & McCabe, 2001); co-occurrence of abuse experiences was evident in the current study as over 60% of those who endorsed a history of childhood maltreatment, in the full study, reported exposure to more than one type of abuse.

One of our secondary hypotheses postulated that particular associated constructs (i.e., anxiety, depression, anxiety sensitivity) would demonstrate stronger relationships
with health anxiety compared to childhood abuse history, as the existing literature consistently supports associations between health anxiety and anxiety (e.g., Noyes et al., 1994), depression (e.g., Barsky et al., 1992), and anxiety sensitivity (e.g., Abramowitz et al., 2007; Stewart & Watt, 2000). This hypothesis was partially supported as only the relationship between health anxiety and general anxiety was statistically different from the relationship between health anxiety and childhood abuse, suggesting that general anxiety demonstrated a relatively stronger relationship with health anxiety. The relationship between health anxiety and both depression and anxiety sensitivity did not demonstrate significantly stronger relationships compared to the association between health anxiety and childhood abuse.

4.3 Predictors of Health Anxiety

Our results revealed partial support for the hypothesis that the constructs of interest, including childhood abuse, would predict health anxiety. When childhood abuse severity was analyzed independent of the associated constructs it was a significant predictor of health anxiety and accounted for a portion of the variance in health anxiety. In contrast to our hypothesis, when all of the constructs of interest (i.e., childhood abuse, emotion regulation, attachment anxiety, general anxiety, depression, anxiety sensitivity) were examined simultaneously, anxiety and anxiety sensitivity were the only variables that demonstrated predictive utility. These results are consistent with previous research that has found anxiety (Kellner, Hernandez, & Pathak, 1992) and anxiety sensitivity (Stewart, Sherry, Watt, Grant, & Hadjistavropoulos, 2008) to be predictive of health anxiety. These findings indicate that childhood abuse was not a unique predictor of health anxiety within this model, suggesting that childhood abuse may demonstrate less
influence on health anxiety in adulthood compared to other associated variables including general anxiety and anxiety sensitivity.

4.4 Tests of the Mediation Models

One of the primary purposes of the current study was to further understand the path from childhood abuse to health anxiety in adulthood. To date, no empirical research has discovered possible constructs that could account for why some maltreated children experience health anxiety in adulthood while others do not. To investigate this query, a number of associated constructs (i.e., emotion dysregulation, anxious attachment, avoidant attachment, and anxiety sensitivity) were examined within a mediation model with overall severity of childhood abuse experiences as the independent variable (as measured by the CTQ total score) and levels of health anxiety in adulthood as the outcome variable (as measured by the SHAI total score). It is important to note that the mediation results do not suggest causation; these analyses do not involve experimental manipulation and therefore cause and effect cannot be inferred from the outcomes.

Based on previous research we hypothesized that emotion dysregulation (e.g., Alink et al., 2009; Amstadter, 2008; Mennin et al., 2005; Orgeta, 2011), attachment orientation (e.g., Hunter & Maunder, 2001; Muller et al., 2000; Schmidt et al., 2002; Waldinger et al., 2006; Wearden et al., 2006), and anxiety sensitivity (Abramowitz et al., 2007; Scher & Stein, 2003; Stewart & Watt, 2000) would mediate the relationship between childhood abuse and health anxiety in adulthood. The results revealed partial support for these hypotheses. The findings indicated that emotion dysregulation, attachment anxiety, and anxiety sensitivity were all partial mediators in this relationship, meaning that the mediating variable (i.e., the associated construct of interest) accounted
for some, but not all, of the relationship between the independent variable (childhood abuse) and the outcome variable (health anxiety). Partial mediation implies that there was a significant relationship between the mediator and the outcome variable; however, there remained a significant, direct relationship between the independent variable and the outcome variable.

In contrast to anxious attachment, avoidant attachment was not revealed as a mediator in this relationship. Although there was a significant, predictive relationship between childhood abuse and avoidant attachment, avoidant attachment did not demonstrate a significant predictive relationship with health anxiety, and as such, this mediation model was not successful. This outcome was anticipated, as avoidant attachment and health anxiety did not demonstrate a statistically significant association in the correlation analysis. This is also consistent with previous research that has found that endorsement of high attachment avoidance was not associated with elevated health anxiety (e.g., Schmidt et al., 2002).

The current study investigated specific mediation models involving the path from childhood abuse to health anxiety based on theories regarding the potential roles of emotion regulation, attachment, and anxiety sensitivity. These results suggest that the path from childhood abuse to adult health anxiety is complex, and that mediating variables including emotion dysregulation, anxious attachment, and anxiety sensitivity may play a role in this relationship. These novel findings provide a further understanding of possible factors that may be associated with health anxiety for individuals who have endured childhood abuse. Additional research is necessary to further explore the relationships between health anxiety and these constructs of interest.
as the current study served as a preliminary investigation of these relationships. These results also warrant further investigation of other possible mediating factors in this relationship, as the variables examined in the current study only accounted for a part of the association between childhood abuse and health anxiety in adulthood.

4.5 The Relationship between Childhood Abuse and Health Anxiety

In the final regression model, which included childhood abuse, anxious attachment, depression, anxiety, and anxiety sensitivity as potential predictor variables, only anxiety and anxiety sensitivity were revealed as unique predictors of health anxiety. These findings suggest that, in this model, variables such as anxiety and anxiety sensitivity play a more substantial role in predicting levels of health anxiety relative to other variables, including childhood abuse. In the presence of the additional variables (i.e., attachment, emotion regulation, anxiety, depression, anxiety sensitivity) childhood abuse was not a significant predictor of health anxiety. However, for a complete interpretation of regression findings, the results from a regression model must be interpreted in conjunction with the bivariate correlation coefficients when the predictor variables are correlated (Courville & Thompson, 2001). Outside of this predictive model, childhood abuse and health anxiety demonstrated a significant relationship of moderate strength (Cohen, 1988). When interpreting results, neither a focus on beta weights or bivariate correlation coefficients is inherently better or correct, it is the consultation of both sets of coefficients that provides a complete interpretation of the data (Courville & Thompson, 2001). It is necessary to consider the strength of bivariate correlation coefficients when interpreting the regression outcomes as regression results only reflect the influence of the predictor variables in that particular model. In the
current study, it is important not to disregard the significant relationship between childhood abuse and health anxiety and the possibility that in a different model childhood abuse could be an important predictor of health anxiety.

4.6 Current Findings and the Interpersonal Model of Health Anxiety

The interpersonal model of health anxiety (Stuart & Noyes, 1999) proposes that health anxiety is a type of interpersonal behaviour that is motivated by insecure attachment, whereby expressing persistent complaints of illness is used to elicit care from others. In support of this model, previous research has found an association between insecure attachment and elevated health anxiety (Noyes et al., 2003; Schmidt et al., 2002; Wearden et al., 2006). The current findings also provide support for the interpersonal model of health anxiety, demonstrating a significant relationship between anxious attachment and elevated health anxiety. Avoidant attachment did not demonstrate a significant relationship with health anxiety, suggesting that anxious attachment is the dimension of attachment that is the most significantly related to health anxiety. The interpersonal model also proposes that childhood abuse can significantly affect the development of insecure attachment styles, which reflects in abnormal illness behaviour and persistent care-seeking later in life. The current study provides support for this view as anxious attachment was significantly related to childhood abuse experiences, and was also a partial mediator in the relationship between childhood abuse and health anxiety in adulthood. However, anxious attachment was not predictive of health anxiety in the presence of additional variables (i.e., childhood abuse, emotion regulation, anxiety, depression, and anxiety sensitivity). This finding suggests that relative to other constructs associated with health anxiety, anxious attachment
demonstrated less influence on health anxiety in adulthood. It is important to note that the current study examined childhood abuse experiences that occurred up to the age of 17 years. Attachment orientation develops through early interactions with caregivers and would likely be most affected by abusive experiences that occurred when the victim was a young child. It is possible that in a sample limited to participants who endured abuse in early childhood, a stronger relationship between childhood abuse and attachment would be demonstrated. Overall, these findings are consistent with previous research that has found a relationship between anxious attachment and elevated health anxiety (Noyes et al., 2003; Schmidt et al., 2002; Wearden et al., 2006) and provided a preliminary investigation of the relationship between childhood abuse, attachment, and health anxiety.

4.7 Strengths, Limitations, and Future Directions

The current study is the first of its kind to examine the impact of five different categories of childhood abuse on health anxiety in adulthood. The previous studies in this area focused solely on childhood physical and sexual abuse (i.e., Barsky et al., 1994; Noyes et al., 2002; Salmon & Calderbank, 1996) and the inclusion of additional forms of maltreatment (i.e., emotional abuse, emotional neglect, and physical neglect) adds to the existing knowledge about factors that are associated with elevated health anxiety. Emotional abuse and neglect are prevalent and serious issues; the inclusion of these factors in the current investigation is a novel and warranted addition to the literature.

The limited research in the area of childhood abuse and health anxiety typically focuses on individuals with hypochondriasis, whereas the current research examined levels of health anxiety in an effort to include a spectrum of health-related anxieties,
including those with subclinical symptoms. Recent research posits that health anxiety can be best understood as a dimensional construct that is continuously distributed within a population, as opposed to the categorical diagnosis of hypochondriasis (e.g., Ferguson, 2009). A dimensional measurement of health anxiety also has the benefit of increasing statistical power (Cohen & Cohen, 1983).

A further unique feature of this study was the examination of potential mediating factors in the relationship between childhood abuse experiences and health anxiety in adulthood. Previous research posited that different factors must mediate the relationship between childhood abuse and illness beliefs and behaviours (Salmon & Calderbank, 1996); however, prior to the current investigation, mediating factors in this relationship were unknown. The current findings revealed that emotion dysregulation, attachment anxiety, and anxiety sensitivity partially mediated this association. These novel findings indicate that while these factors play a role in the relationship between childhood abuse and health anxiety, a significant portion of the effect of childhood abuse on health anxiety remains unexplained; further research is necessary to examine additional mediating factors.

While there are several strengths to the current study, there are also a number of potential study limitations to consider. First, the study is limited by the retrospective nature of the childhood abuse data, as participants may have difficulty recalling events that have occurred in the past. Despite the potential of retrospective reports to introduce some sampling error, there is empirical support for the validity of accurate recall of adverse childhood events (Hardt & Rutter, 2004). Second, although this study is examining the relationship between childhood abuse, health anxiety, and related
constructs (e.g., emotion regulation, attachment, depression, anxiety, anxiety sensitivity) there may be additional extraneous variables (e.g., personality factors, adult abuse experiences, availability of social support, relationship to the abuser, access to mental health services, other traumatic events experienced) that were not considered in this investigation due to time constraints. Future research should explore additional variables that may be associated with childhood maltreatment and the development of health anxiety to provide more comprehensive knowledge of these relationships. Third, utilizing a university sample may limit the generalizability of the findings. The majority of participants in our sample were female, Caucasian, first-year university students. Future studies should utilize more diverse adult samples for further generalizability of the results. In addition, a relatively small percentage of those who endorsed a history of childhood abuse reported sexual abuse (14.4%) and physical neglect (11.0%). Future studied should utilize a larger sample of those who report these categories of abuse for a more complete understanding of the relationship between these types of abuse experiences and health anxiety. Fourth, when assessing emotion regulation, it is important to consider cultural variables that may play a significant role in emotion management; different cultures have varying expectations regarding appropriate and inappropriate emotion expression and regulation (Fredrickson, 1998). Although it is important to consider the potential impact of culture, a focus on the influence of cultural variables was outside of the scope of this project. Future studies may benefit from including a cultural component when examining emotion regulation. Fifth, the cross-sectional nature of the data precludes an assessment of the temporal relationship between childhood abuse and health anxiety. Future studies should employ a longitudinal design
in order to clarify this relationship as previous literature has indicated that health anxiety can develop in childhood (e.g., Wright & Asmundson, 2003, 2005) and it is conceivable that the onset of health anxiety may have preceded the occurrence of abuse in childhood. For example, a study that measures health anxiety annually throughout childhood and assesses childhood abuse experiences retrospectively in young adulthood would provide further information regarding the onset of health anxiety and abuse experiences in those affected. Sixth, while the current study offers support for the interpersonal model of health anxiety, the investigation is limited in the extension to other models of health anxiety. Future studies should examine these relationships in the context of the cognitive-behavioural model for a more comprehensive understanding of the mechanisms that underlie and maintain health anxiety. The cognitive-behavioural model of health anxiety proposes that maladaptive core beliefs regarding health and illness play a major role in the development of health anxiety (Salkovskis & Warwick, 2001). Thus, future research should include a measure of health beliefs when examining the relationship between childhood abuse, health anxiety, and associated constructs to examine the role of health-related cognitions in these relationships. Lastly, the data for the current research were collected via a web-based survey. There are a number of concerns associated with web-based data collection including random responding, multiple submissions by the same participant, and providing false information regarding one’s identity. Despite the concerns regarding this method, there is support that Internet findings generalize across different administration formats, are not adversely influenced by dishonest or repeat responders, and provide results that are consistent with traditional data collection methods (Gosling, Vazire, Srivastava, & John, 2004). An additional
drawback to online data collection is that the respondents do not have an opportunity to request assistance or to ask for clarification from the researcher if needed. On the other hand, online data collection has the benefit or providing privacy and anonymity when examining sensitive research topics.

4.8 Scientific and Clinical Implications

The results of this research provide empirical evidence for the relationship between childhood abuse experiences and health anxiety, advancing the current knowledge of factors associated with health anxiety in adulthood. These findings assist in clarifying the relationship between childhood abuse and health anxiety in adulthood, as previous empirical findings have demonstrated mixed results (i.e., Barsky et al., 1994; Noyes et al., 2002; Salmon & Calderbank, 1996). In sum, health anxiety was positively associated with overall severity of childhood abuse and all five childhood abuse categories (i.e., emotional, physical, and sexual abuse, and emotional and physical neglect). In addition, the current study investigated potential mediating factors in the relationship between childhood abuse and health anxiety and found that emotion dysregulation, attachment anxiety, and anxiety sensitivity partially mediated this relationship. These findings contribute to an understanding of factors that may be associated with childhood maltreatment and health anxiety in adulthood. Further research is necessary to determine additional mediating variables, as these partial mediators did not fully account for the relationship between childhood abuse and health anxiety. These findings also contribute to the theoretical literature by providing support for the interpersonal model of health anxiety, as anxious attachment was significantly associated with elevated health anxiety. In addition, the findings provided preliminary
support for a relationship between emotion dysregulation and elevated health anxiety and
warrant further investigation of the role of emotion regulation in the experience of health anxiety.

The current findings have important clinical implications. First, the findings indicated that emotional abuse and neglect demonstrated a significant relationship with health anxiety, as well as emotion dysregulation, insecure attachment, depression, anxiety, and anxiety sensitivity, further emphasizing the detrimental effects of these often-unacknowledged forms of childhood abuse. Emotional abuse and neglect are serious and widespread forms of childhood maltreatment that should be addressed in clinical settings. Second, our findings reveal specific variables, namely anxiety sensitivity and general anxiety, that predict adult health anxiety. These findings are consistent with the extant literature and reiterate the importance of considering these factors when developing assessment and intervention strategies for health anxiety. Third, health anxiety was positively associated with overall severity of childhood abuse, which suggests that individuals with a significant childhood abuse history may be at an increased risk for the development of health anxiety. Accordingly, an early intervention focus on individuals who have an extensive history of childhood maltreatment may serve to prevent or reduce health anxiety. Furthermore, current findings indicate that a number of factors play a role in the path from childhood abuse experiences to health anxiety in adulthood, and that particular variables (i.e., emotion dysregulation, attachment anxiety, anxiety sensitivity) play a partial mediating role in this relationship. These novel findings provide a further understanding of possible risk factors that may be associated with health anxiety for individuals who have endured childhood abuse. An
understanding of the mediating factors in this relationship may also have implications for the assessment and treatment of health anxiety. For example, identifying and treating emotion dysregulation, attachment issues, and anxiety sensitivity in individuals with a history of childhood abuse may avert the development of health anxiety in adulthood. The current results and subsequent research can assist the development of prevention, assessment, and intervention strategies related to elevated levels of health anxiety.
5.0 References


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doi:10.1016/j.psychres.2010.08.018


Appendix A.

OFFICE OF RESEARCH SERVICES
MEMORANDUM

DATE: September 13, 2012

TO: Sarah Jane Reiser
456 Hamilton Street
Regina, SK S4R 2A7

FROM: Dr. Larena Hoeber
Chair, Research Ethics Board

Re: Childhood Abuse and the Development of Health Anxiety: The Roles of Attachment and Emotion Regulation (File # 08S1213)

Please be advised that the University of Regina Research Ethics Board has reviewed your proposal and found it to be:

☐ 1. APPROVED AS SUBMITTED. Only applicants with this designation have ethical approval to proceed with their research as described in their applications. For research lasting more than one year (Section 1F), ETHICAL APPROVAL MUST BE RENEWED BY SUBMITTING A BRIEF STATUS REPORT EVERY TWELVE MONTHS. Approval will be revoked unless a satisfactory status report is received. Any substantive changes in methodology or instrumentation must also be approved prior to their implementation.

☐ 2. ACCEPTABLE SUBJECT TO MINOR CHANGES AND PRECAUTIONS (SEE ATTACHED). Changes must be submitted to the REB and approved prior to beginning research. Please submit a supplementary memo addressing the concerns to the Chair of the REB. **Do not submit a new application.** Once changes are deemed acceptable, ethical approval will be granted.

☐ 3. ACCEPTABLE SUBJECT TO CHANGES AND PRECAUTIONS (SEE ATTACHED). Changes must be submitted to the REB and approved prior to beginning research. Please submit a supplementary memo addressing the concerns to the Chair of the REB. **Do not submit a new application.** Once changes are deemed acceptable, ethical approval will be granted.

☐ 4. UNACCEPTABLE AS SUBMITTED. The proposal requires substantial additions or redesign. Please contact the Chair of the REB for advice on how the project proposal might be revised.

Dr. Larena Hoeber

cc: Dr. Kristi D. Wright – Psychology Department

**supplementary memo should be forwarded to the Chair of the Research Ethics Board at the Office of Research Services (Research and Innovation Centre, Room 109) or by e-mail to research.ethics@uregina.ca**

Phone: (306) 585-4775
Fax: (306) 585-4693
Appendix B.

Pre-Screen Consent Form

Project Title: Childhood Abuse Experiences and Anxiety

Researcher: Sarah J. Reiser, B.A.
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Supervisor: Kristi D. Wright, Ph.D.
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University of Regina
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Purpose and Objective: The primary purpose of the present study is to examine the relationship between childhood abuse experiences and anxiety in adulthood. In addition, the research aim is to explore the roles of attachment and emotion regulation in this relationship.

Procedures: You, a current psychology student of the University of Regina, are being pre-screened for eligibility to take part in an online study about childhood abuse experiences and anxiety in adulthood. After completion of the following questionnaire, you may be contacted by the Primary Investigator, Sarah Reiser, to participate in the full study. Students recruited through the psychology participant pool will be given a 1% course credit for one hour of participation. Those not eligible to participate through the participant pool will have the option of being entered into a draw to win one of two $50 Southland Mall gift certificates. There is no compensation for participation in the pre-screening. Before you agree to participate, we would like to provide you with information about the procedures involved in the study so that you can make an informed decision. You will be asked to read and complete this informed consent form. Following consent, you will be asked to complete a brief demographics questionnaire, as well as a questionnaire about your history of childhood abuse experiences. Total time is expected to be approximately 5 to 10 minutes. Please feel free to ask any questions regarding the procedures and goals of the study or your role. (Please note: For those students who have the research supervisor, Dr. Kristi Wright, as a professor, Dr. Wright will not know who did and did not participate in the pre-screen. Dr. Wright will not be in the classroom during the pre-screen and will not have access to any of the pre-screen forms. If you are in Dr. Wright’s class you will not receive any additional privileges if you chose to participate in this pre-screen or incur any penalties by participating or not participating in this study).
If you are contacted to participate in the full online study, you will be asked to read and complete a full study consent form. Following consent you will be asked to complete a short demographics form and a total of eight questionnaires that will ask questions about your experiences with childhood abuse, health anxiety, attachment orientation, emotion regulation, anxiety, and mood. The total time is expected to be approximately 1 hour.

**Funded by:** This project had been funded by the Canadian Institutes of Health Research (CIHR).

**Voluntary Participation:** Participation in this study is entirely voluntary, so it is your decision whether or not to take part in this study. Before you make a decision it is important for you to understand what the research involves. This consent form will tell you about the study, the purpose of the research, what will happen during the study, and the possible risks, and benefits. If you do decide to take part in this study, you will be asked to sign this consent form. Even after signing the informed consent form, you can choose to drop-out at any time, refuse to answer any questions, as well as request that the information collected not be used. Choosing not to participate will not result in any negative consequences (e.g., affecting grades or services provided by the university).

**Who is conducting the study:** The Primary Investigator is Sarah J. Reiser, B.A. She is a Master’s student in Clinical psychology at the University of Regina. This project is part of a Master’s thesis required for partial fulfillment of the University of Regina’s Master’s program.

**Potential Risks:** Some of the survey content (i.e., questions regarding childhood abuse history) could elicit emotional discomfort. The pre-screen questionnaire could be potentially upsetting and includes questions regarding childhood sexual abuse, physical abuse from parents, and parents who abused alcohol/drugs. If you do experience distress due to the survey content, we would like to remind you that your participation is voluntary and you may withdraw from the survey for any reason, at any time, without explanation. You may also bypass any questions you do not want to answer. Please see the bottom of this consent form for contact information for mental health resources that are available to you in the case that do experience distress and would like to seek assistance.

**Potential Benefits:** No direct benefit can be guaranteed; however, it is anticipated that the findings from this investigation will facilitate further knowledge of anxiety and the role of childhood abuse, attachment, and emotion regulation in the experience of health anxiety. Although participants may not benefit directly from this study, it has the potential to greatly improve our understanding of anxiety.

**Confidentiality:** Any information gathered during the data collection process is strictly confidential and will be used for research purposes only by the University of Regina. All information collected will be made anonymous. The electronic file will not contain any identifying information. The consent forms (containing the participant name) will be kept separate from the participant responses. No participant names will be put on the
questionnaires or the demographic form. All of the information that we collect will be stored on a lap top/lab computer (requiring an access code) at the University of Regina in the primary investigator’s research lab for an indefinite amount of time.

**Right to Withdraw:** As a reminder, your participation is voluntary and you may withdraw from the pre-screening process for any reason, at any time without explanation.

**Follow up:** A summary of study results will be available once all data have been collected and analyzed. This will likely take over a year. If you would like to view the results of this project or have any further questions regarding research findings, please feel free to contact us.

**Questions or Concerns:** If you have any questions, feedback or comments about the research study or the results of the research study, please feel free to contact the Primary Investigator, Sarah Reiser or the research supervisor, Dr. Kristi D. Wright (see the contact information at the top of page 1).

If you have any questions or concerns about your rights as a research participant, you may contact the Chair of the Research Ethics Board at (306) 585-4775 (email: research.ethics@uregina.ca).

The following resources are available if you are experiencing emotional distress due to the pre-screen content and require assistance:

U of R Counselling Services: 585-4491  
Crisis/Suicide Line: 525-5333  
Mobile Crisis Line: 525-5333  
Mental Health Clinic: 766-7800

**Participant Consent to Participate:**

1. Are you 18 years of age or older?
   
   _____Yes  _____No

2. Have you read and understood the information page?
   
   _____Yes  _____No

3. Do you freely and voluntarily consent to take part in the research?
   
   _____Yes  _____No
4. Do you understand that you are being pre-screened for eligibility for participation in a full study?

_____ Yes  _____ No

*** Providing your email address (on Page 4) indicates your consent to participate in the pre-screening process of this project.
Appendix C.

Consent Form

Project Title: Childhood Abuse and Health Anxiety: The Roles of Attachment and Emotion Regulation

Researcher: Sarah J. Reiser, B.A.
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Email: kristi.wright@uregina.ca

Purpose and Objective: You are being invited to take part in an online study to examine childhood abuse experiences and the development of health anxiety. The primary purpose of the present study is to examine the relationship between childhood abuse experiences and health anxiety in adulthood. In addition, the research aims to explore the roles of attachment and emotion regulation in this relationship.

Procedures: You, a current psychology student of the University of Regina, are being invited to participate in an online study. Students recruited through the psychology participant pool will be given a 1% course credit for one hour of participation. Before you decide if you wish to participate, we would like to provide you with information about the procedures involved in the study so that you can make an informed decision. Firstly, you will be asked to read and complete this informed consent form. Following consent you will be asked to complete a short demographics form and then you will be asked to complete a total of eight questionnaires that will ask questions about your experiences with childhood abuse, health anxiety, attachment orientation, emotion regulation, anxiety, and mood. The total time is expected to be approximately 1 hour, however it may take less time. Please feel free to ask any questions regarding the procedures and goals of the study or your role.

Funded by: This project had been funded by the Canadian Institutes of Health Research (CIHR).
Voluntary Participation: Participation in this study is completely voluntary, so it is your decision whether or not you want to take part. To help you decide whether you do or do not want to participate, it is important to understand what this research involves. This consent form will describe the study, the purpose of the research, what will happen during the study, and the possible risks and benefits. If you do decide to take part in this study, you will be asked to sign this consent form to indicate your informed consent to participate. Although, even after you sign you can choose to drop out at any time, refuse to answer any questions, as well as request that the information collected not be used. Lack of participation will not result in any negative consequences.

Who is conducting the study: The Primary Investigator is Sarah J. Reiser. She is a clinical psychology student completing her Master’s degree at the University of Regina. This project is a part of her Master’s thesis required for partial fulfillment of the University of Regina’s Clinical Psychology Master’s program.

Potential Risks: Some of the survey content (i.e., questions regarding childhood abuse history) could elicit emotional discomfort. The questionnaires could be potentially upsetting and include questions regarding childhood sexual abuse, physical abuse from parents, and parents who abused alcohol/drugs. If you do experience distress due to the survey content, we would like to remind you that your participation is voluntary and you may withdraw from the survey for any reason, at any time, without explanation. You may also bypass any questions you do not want to answer. The online survey will also include a “skip” function whereby participants who experience extreme distress can automatically be directed to a page with the contact information of the mental health professional, a phone number for the suicide prevention hotline, and an option for the participant to provide their contact information for the purposes of being contacted by a mental health professional in regards to the distress elicited by the survey content.

Potential Benefits: No direct benefits can be guaranteed; however, it is anticipated that the findings from this investigation will facilitate further knowledge of health anxiety and the role of childhood abuse, attachment, and emotion regulation in the experience of health anxiety. Although participants may not benefit directly from this study, it has the potential to greatly improve our understanding of health anxiety.

Compensation: Eligible psychology undergraduate students (i.e., those who participate through the participant pool) will receive an extra 1% course credit towards their course grade. If you are not eligible to receive the additional course credit, you will have the option of being entered into a draw to win one of two $50 Southland Mall gift certificates.

Confidentiality: Any information gathered during the data collection process is strictly confidential and will be used for research purposes only by the University of Regina. All information collected will be made anonymous. The electronic file will not contain any identifying information. The consent forms (containing the participants names) will be kept separate from the participant responses. Participant names will not be put on the demographics forms or any of the questionnaires. The student ID number or the email
address provided to receive the compensation will be kept separate from all forms and will not be linked to any data collected. The names of participants who consented to partake will be kept in a separate password protected file and this file will be kept in the primary researcher’s lab at the University of Regina for a period of 5 years after which it will be deleted. All of the unidentifiable data that we collect will be stored on a laptop/lab computer (requiring an access code) at the University of Regina in the primary investigator’s research lab for a minimum of 5 years for future reference.

**Use of Survey Monkey:** It is also important for you to know that "Survey Monkey", a web-survey company that is located in the USA, is the host of this on-line research. This company is subject to U.S. laws; in particular, the US Patriot Act that allows authorities access to the records of Internet service providers. Survey Monkey's servers record incoming IP addresses - including that of the computer that you use to access the survey. However, no connection is made between your data and your computer's IP address. If you choose to participate in the survey, you understand that your anonymous responses to the survey questions will be stored and accessed in the USA. **As An Internet-Based Study, What Are the Possible Breaches to Confidentiality and Security:** As an Internet-based research study, there is very little risk that participation may compromise your privacy. A description of these risks follows:

1. To prevent multiple submissions from the same source, this study will record your computer's Internet address, which is a special identification number assigned to your computer by your Internet Service Provider. This information will be stored in a file until the research is completed, at which point the file will be deleted. This information will not be used to identify individuals.

2. The electronic submission of your responses may, in rare instances, be intercepted by unauthorized third parties using sophisticated tools. The likelihood of this occurring is extremely rare and is a risk for anyone when using a computer generally.

3. When using a computer that is connected to the Internet to access websites, information about the websites that you visit will be stored in your Internet browser's history list and in its disk cache. This can be resolved by clearing the history list and disk cache. Note, however, that responses to the survey are only stored temporarily on your computer until you close your browser window. Therefore, after you submit your responses, your computer will automatically delete this information.

4. Given the manner in which this study is being conducted, all of the survey responses will be sent immediately to the survey software website. The survey software website then stores the responses in a private folder accessible only by the primary researchers. All responses will be downloaded weekly and kept in a secure location by the primary researcher until the conclusion of the study. The data stored on these disks cannot be associated with you or your Internet address.

**Right to Withdraw:** As a reminder, your participation is voluntary and you may withdraw from the research project for any reason, at any time without explanation or
penalty of any sort. Should you wish to withdraw, you may exit the study at any time and any information obtained will be permanently deleted from our data collection. Your right to withdraw data from the study will apply until data has been pooled (the estimated date for this is February 2013). After this it is possible that some form of research dissemination will have already occurred and it may not be possible to withdraw your data.

**Follow up:** A summary of study results will be available once all data have been collected and analyzed. This will likely take over a year. For this information, or any further questions regarding research findings, you may contact the researchers using the information at the top of page 1.

**Questions or Concerns:** If you have any questions, concerns, or feedback about the research study or the results of the research study, please feel free to contact the researchers using the information at the top of page 1.

If you have any questions or concerns about your rights as a research participant, you may contact the Chair of the Research Ethics Board at (306) 585-4775 (email: research.ethics@uregina.ca).

**Participant Consent to Participate:**

Are you 18 years of age or older?

Yes

No

Have you read and understood the information page?

Yes

No

Do you freely and voluntarily consent to take part in the research?

Yes

No

Completion of this online questionnaire implies consent to participate in this project. If you have questions you may e-mail the primary investigator, Sarah Reiser, at reiser2s@uregina.ca or, you may contact her supervisor, Dr. Kristi Wright, at kristi.wright@uregina.ca.
You may also contact the Chair of the Research Ethics Board at the University of Regina at (306) 585-4775 or by e-mail: research.ethics@uregina.ca

The following resources are available if you are experiencing emotional distress due to the survey content and require assistance:

U of R Counselling Services: 585-4491  Crisis/Suicide Line: 525-5333
Mobile Crisis Line: 525-5333  RQHR Mental Health Clinic: 766-7800
Appendix D.

Pre-Screen Questionnaire

The following questions ask about events or circumstances you may have experienced while growing up. While you were growing up, during your first 18 years of life:

YES          NO

1. Did a parent or other adult in the household often or very often swear at you, insult you, put you down, or humiliate you?

2. Did a parent or other adult in the household often or very often act in a way that made you afraid that you might be physically hurt?

3. Did a parent or other adult in the household often or very often push, grab, slap, or throw something at you?

4. Did a parent or other adult in the household ever hit you so hard that you had marks or were injured?

5. Did an adult or person at least 5 years older than you ever touch or fondle you or have you touch their body in a sexual way?

6. Did an adult or person at least 5 years older than you ever attempt or actually have oral, anal, or vaginal intercourse with you?

7. Did you often or very often feel that no one in your family loved you or thought you were important or special?

8. Did you often or very often feel that your family didn’t look out for each other, feel close to each other, or support each other?

9. Did you often or very often feel that you didn’t have enough to eat, had to wear dirty clothes, and had no one to protect you?
10. Did you **often or very often** feel that your parents were too drunk or high to take care of you or take you to the doctor if you needed it?
Appendix E.

Demographic Information Form

1. What is your sex?
   _____Male        _____Female

2. How old are you?
   Age: _______

3. What is your date of birth? (Month, Day, Year)
   Birthday: MM DD YY

4. What is your ethnicity?
   _____White/Caucasian   _____Black/African   _____Hispanic
   _____Asian   _____Aboriginal/First Nations   _____Middle Eastern
   _____Mixed Ethnicity   _____Other (please specify)

5. What is your highest level of education?
   University: _____first year _____second year _____more than 4 years
   _____third year _____fourth year

6. What is your current relationship status?
   _____Single   _____In a relationship

7. What is your parents’ current relationship status?
   _____Married   _____Divorced   _____Separated   _____Other (please specify)

8. Do you have an existing health condition?
   YES       NO

If YES, please list:
9. As a child (before age 18) did you have a diagnosed medical condition or experience a serious injury?

YES   NO

If YES, please list:

10. Do you have an existing mental health condition (e.g., attention deficit/hyperactivity disorder, depression, panic disorder, schizophrenia)?

YES   NO

If YES, please list:

11. Have you previously had a mental health condition?

YES   NO

If YES, which condition(s)? And how old were you?
Appendix F.

Short Health Anxiety Inventory

Instructions: Each question in this section consists of a group of four statements. Please read each group of statements carefully and then select the one that best describes your feelings, over the past 6 months. Identify the statement by choosing the letter next to it, i.e., if you think that statement (a) is correct, choose statement (a); it may be that more than one statement applies, in which case, please choose any that are applicable.

1. (a) I do not worry about my health.
   (b) I occasionally worry about my health.
   (c) I spend much of my time worrying about my health.
   (d) I spend most of my time worrying about my health.

2. (a) I notice aches/pains less than most other people (of my age).
   (b) I notice aches/pains as much as most other people (of my age).
   (c) I notice aches/pains more than most other people (of my age).
   (d) I am aware of aches/pains in my body all the time.

3. (a) As a rule I am not aware of bodily sensations or changes.
   (b) Sometimes I am aware of bodily sensations or changes.
   (c) I am often aware of bodily sensations or changes.
   (d) I am constantly aware of bodily sensations or changes.

4. (a) Resisting thoughts of illness is never a problem.
   (b) Most of the time I can resist thoughts of illness.
   (c) I try to resist thoughts of illness but am often unable to do so.
   (d) Thoughts of illness are so strong that I no longer even try to resist them.

5. (a) As a rule I am not afraid that I have a serious illness.
   (b) I am sometimes afraid that I have a serious illness.
   (c) I am often afraid that I have a serious illness.
   (d) I am always afraid that I have a serious illness.

6. (a) I do not have images (mental pictures) of myself being ill.
   (b) I occasionally have images of myself being ill.
   (c) I frequently have images of myself being ill.
   (d) I constantly have images of myself being ill.

7. (a) I do not have any difficulty taking my mind off thoughts about my health.
   (b) I sometimes have difficulty taking my mind off thoughts about my health.
   (c) I often have difficulty in taking my mind off thoughts about my health.
   (d) Nothing can take my mind off thoughts about my health.

8. (a) I am lastingly relieved if my doctor tells me there is nothing wrong.
(b) I am initially relieved but the worries sometimes return later.
(c) I am initially relieved but the worries always return later.
(d) I am not relieved if my doctor tells me there is nothing wrong.

9.   (a) If I hear about an illness I never think I have it myself.
(b) If I hear about an illness I sometimes think that I have it myself.
(c) If I hear about an illness I often think I have it myself.
(d) If I hear about an illness I always think that I have it myself.

10.  (a) If I have a bodily sensation or change I rarely wonder what it means.
(b) If I have a bodily sensation or change I often wonder what it means.
(c) If I have a bodily sensation or change I always wonder what it means.
(d) If I have a bodily sensation or change I must know what it means.

11.  (a) I usually feel at very low risk for developing a serious illness.
(b) I usually feel at fairly low risk for developing a serious illness.
(c) I usually feel at moderate risk for developing a serious illness.
(d) I usually feel at high risk for developing a serious illness.

12.  (a) I never think that I have a serious illness.
(b) I sometimes think that I have a serious illness.
(c) I often think that I have a serious illness.
(d) I usually think that I have a serious illness.

13.  (a) If I notice an unexplained bodily sensation I don’t find it difficult to think about other things.
(b) If I notice an unexplained bodily sensation I sometimes find it difficult to think about other things.
(c) If I notice an unexplained bodily sensation I often find it difficult to think about other things.
(d) If I notice an unexplained bodily sensation I always find it difficult to think about other things.

14.  (a) My family/friends would say I do not worry enough about my health.
(b) My family/friends would say I have a normal attitude about my health.
(c) My family/friends would say I worry too much about my health.
(d) My family/friends would say I am a hypochondriac.
Appendix G.

Childhood Trauma Questionnaire

Note: Questions are unavailable due to copyright protection.
Appendix H.

Difficulties in Emotion Regulation Scale

Using the following scale, indicate how often the following statements apply to you.

1. I am clear about my feelings.
2. I pay attention to how I feel.
3. I experience my emotions as overwhelming and out of control.
4. I have no idea how I am feeling.
5. I have difficulty making sense out of my feelings.
6. I am attentive to my feelings.
7. I know exactly how I am feeling.
8. I care about what I am feeling.
9. I am confused about how I feel.
10. When I’m upset, I acknowledge my emotions.
11. When I’m upset, I become angry with myself for feeling that way.
12. When I’m upset, I become embarrassed for feeling that way.
13. When I’m upset, I have difficulty getting work done.
14. When I’m upset, I become out of control.
15. When I’m upset, I believe that I will remain that way for a long time.
16. When I’m upset, I believe that I’ll end up feeling very depressed.
17. When I’m upset, I believe that my feelings are valid and important.
18. When I’m upset, I have difficulty focusing on other things.
19. When I’m upset, I feel out of control.
20. When I’m upset, I can still get things done.
21. When I’m upset, I feel ashamed with myself for feeling that way.
22. When I’m upset, I know that I can find a way to eventually feel better.
23. When I’m upset, I feel like I am weak.
24. When I’m upset, I feel like I can remain in control of my behaviours.
25. When I’m upset, I feel guilty for feeling that way.
26. When I’m upset, I have difficulty concentrating.
27. When I’m upset, I have difficulty controlling my behaviours.
28. When I’m upset, I believe that there is nothing I can do to make myself feel better.
29. When I’m upset, I become irritated with myself for feeling that way.
30. When I’m upset, I start to feel very bad for myself.
31. When I’m upset, I believe that wallowing in it is all I can do.
32. When I’m upset, I lose control over my behaviours.
33. When I’m upset, I have difficulty thinking about anything else.
34. When I’m upset, I take time to figure out what I’m really feeling.
35. When I’m upset, it takes me a long time to feel better.
36. When I’m upset, my emotions feel overwhelming.
1 = Almost never (0-10%)
2 = Sometimes (11-35%)
3 = About half the time (36-65%)
4 = Most of the time (99-100%)
5 = Almost always (91-100%)
Appendix I.

Experiences in Close Relationships – Revised

The statements below concern how you feel in emotionally close relationships. We are interested in how you generally experience close relationships, not just in what is happening in a current relationship. Respond to each statement by choosing a response to indicate how much you agree or disagree with each statement (on a scale of 1 [strongly disagree] to 7 [strongly agree]).

1. I often worry that others don't really love me.
2. I often worry that others will not want to stay with me.
3. I'm afraid that I will lose others’ love.
4. I worry that others won’t care about me as much as I care about them.
5. I often wish that others’ feelings for me were as strong as my feelings for them.
6. I worry a lot about my relationships.
7. When others out of sight, I worry that they might become interested in someone else.
8. When I show my feelings for others, I'm afraid they will not feel the same about me.
9. I rarely worry about others leaving me.
10. Others make me doubt myself.
11. I do not often worry about being abandoned.
12. I find that others don't want to get as close as I would like.
13. Sometimes others change their feelings about me for no apparent reason.
14. My desire to be very close sometimes scares others away.
15. I'm afraid that once others get to know me, they won't like who I really am.
16. It makes me mad that I don't get the affection and support I need from others.
17. I worry that I won't measure up to others.
18. Others only seem to notice me when I’m angry.
19. I prefer not to show others how I feel deep down.
20. I feel comfortable sharing my private thoughts and feelings with others.
21. I find it difficult to allow myself to depend on others.
22. I am very comfortable being close to others.
23. I don't feel comfortable opening up to others.
24. I prefer not to be too close to others.
25. I get uncomfortable when others want to be very close.
26. I find it relatively easy to get close to others.
27. It's not difficult for me to get close to others.
28. I usually discuss my problems and concerns with others.
29. It helps to turn to others in times of need.
30. I tell others just about everything.
31. I talk things over with others.
32. I am nervous when others get too close to me.
33. I feel comfortable depending on others.
34. I find it easy to depend on others.
35. It's easy for me to be affectionate with others.
36. Others really understand me and my needs.
Appendix J.

Center for Epidemiologic Studies Depression Scale – Revised

Below is a list of the ways you might have felt or behaved. Please choose the best option to indicate how often you have felt this way in the past week or so.

1. My appetite was poor.
2. I could not shake off the blues.
3. I had trouble keeping my mind on what I was doing.
4. I felt depressed.
5. My sleep was restless.
6. I felt sad.
7. I could not get going.
8. Nothing made me happy.
9. I felt like a bad person.
10. I lost interest in my usual activities.
11. I slept much more than usual.
12. I felt like I was moving too slowly.
13. I felt fidgety.
14. I wished I were dead.
15. I wanted to hurt myself.
16. I was tired all the time.
17. I did not like myself.
18. I lost a lot of weight without trying to.
19. I had a lot of trouble getting to sleep.
20. I could not focus on the important things.

0 = Not at all or less than one day
1 = 1-2 days
2 = 3-4 days
3 = 5-7 days
4 = Nearly every day for 2 weeks
Appendix K.

Anxiety Sensitivity Index – 3

For each statement below, please choose the response that best represents how well the statement describes you.

1. It is important for me not to appear nervous.
2. When I cannot keep my mind on a task, I worry that I might be going crazy.
3. It scares me when my heart beats rapidly.
4. When my stomach is upset, I worry that I might be seriously ill.
5. It scares me when I am unable to keep my mind on a task.
6. When I tremble in the presence of others, I fear what people might think of me.
7. When my chest feels tight, I get scared that I won’t be able to breathe properly.
8. When I feel pain in my chest, I worry that I’m going to have a heart attack.
9. I worry that other people will notice my anxiety.
10. When I feel “spacey” or spaced out I worry that I may be mentally ill.
11. It scares me when I blush in front of people.
12. When I notice my heart skipping a beat, I worry that there is something seriously wrong with me.
13. When I begin to sweat in a social situation, I fear people will think negatively of me.
14. When my thoughts seem to speed up, I worry that I might be going crazy.
15. When my throat feels tight, I worry that I could choke to death.
16. When I have trouble thinking clearly, I worry that there is something wrong with me.
17. I think it would be horrible for me to faint in public.
18. When my mind goes blank, I worry there is something terribly wrong with me.

0 = Agree very little
1 = Agree a little
2 = Somewhat agree
3 = Agree a lot
4 = Agree very much
Appendix L.

Trait Form of the State-Trait Anxiety Inventory

Note: Questions are unavailable due to copyright protection.
Appendix M.

Debriefing Form

**Project Title:** Childhood Abuse and Health Anxiety: The Roles of Attachment and Emotion Regulation

Thank you for taking the time to participate in this study on childhood abuse experiences and the development of health anxiety. This study constitutes the Master’s thesis of Sarah Reiser and your contribution is appreciated.

It is generally believed that experiences in childhood can predispose a person to the development of health anxiety later in life (e.g., Noyes et al., 2002), including findings that suggest that a history of childhood abuse may be associated with later development of health anxiety (e.g., Barsky, Wool, Barnett, & Cleary, 1994). However, empirical research exploring this relationship is limited and the few studies that do examine this relationship reveal mixed findings on the potential association (i.e., Barsky et al., 1994; Noyes et al., 2002; Salmon & Calderbank, 1996). If childhood abuse experiences are associated with the development of health anxiety, it is imperative to further explore the possible factors that may contribute to this relationship.

The researchers in the present study are seeking to investigate the association between childhood abuse experiences and health anxiety and the roles that emotion regulation and attachment orientation may play in this relationship. It is anticipated that this research will provide further knowledge of potential precipitants to the development of health anxiety. The findings may also assist in clarifying the relationship between childhood abuse experiences and health anxiety in adulthood, as previous empirical findings have demonstrated mixed results. Specifically, investigating the roles of emotion regulation and attachment may allow for a better understanding of why some maltreated children develop health anxiety and some do not; this potential finding may have implications for strategies that may be useful in the prevention or treatment of health anxiety.

Thank you for your participation. If you are interested in the results of this study please contact the primary investigator, Sarah Reiser (reiser2s@uregina.ca), who will arrange for the information to be sent to you once the study is complete. Questions are welcomed, and any concerns that you may have are important and should be addressed.

The following resources are available if you experienced emotional distress due to the survey content and require assistance:

- U of R Counselling Services: 585-4491
- Mobile Crisis Line: 525-5333
- Crisis/Suicide Line: 525-5333
- RQHR Mental Health Clinic: 766-7800