

An Investigation of the Perceived Stress, Coping Strategies, and Physical Health of  
Childhood Maltreatment Survivors

by

Alanna D. Hager  
B.A., McGill University, 2006

A Thesis Submitted in Partial Fulfillment of the  
Requirements for the Degree of

MASTER OF SCIENCE

in the Department of Psychology

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University of Victoria

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### Abstract

This study investigated links between childhood maltreatment (CM), perceived stress, coping strategies, and physical health problems among adult women. There is mounting evidence to suggest that perceived stress and coping strategies help to explain the association between CM and physical health outcomes. However, research has yet to clarify the precise mechanisms through which stress and coping independently, and in combination, predict the health concerns of victimized women. Through the use of structural equation modeling (SEM), support was found for a model in which perceived stress partially mediated the association between CM and physical health problems. While emotion-focused coping was also found to partially mediate the CM-health relationship, problem-focused and avoidance coping did not. A moderated mediation model revealed that each coping strategy moderated the impact of maltreatment, but not of perceived stress, on physical health. Multi-mediation model testing indicated that

emotion-focused coping and perceived stress better explain the relationship between CM and health than either variable on its own, and that this coping strategy fully accounted for the link between CM and subsequent stress. Finally, multivariate regression analyses revealed that child physical abuse was uniquely associated with greater physical symptoms, and child psychological maltreatment had a unique link with functional impairment; however, no form of abuse uniquely explained health care utilization. Findings suggest that child maltreatment is a risk factor for adverse health outcomes in later life and that stress and coping strategies are important mechanisms in this relationship. Implications for clinicians, medical professionals, and researchers are discussed.

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## Introduction

Over the last few decades, an abundance of research has demonstrated that childhood maltreatment (CM) can have deleterious effects on women's well-being throughout life. Although the effects of CM on psychological outcomes have been well-established, the impact of CM on physical health is a relatively new and critical focus of the literature. There is mounting evidence that both perceived stress and coping strategies might independently explain the link between child maltreatment and physical health. Moreover, the literature suggests that these two variables might operate together to explain this relationship. Although a number of mechanisms have been suggested, it remains unclear how stress and coping strategies might work together to impact physical health status. One likely hypothesis is that coping strategies moderate the effects of stress on health. Alternatively, maladaptive coping strategies might lead to the development of greater perceived stress in the aftermath of abuse, which in turn might account for greater physical health problems.

The present study explores relationships between various forms of CM, perceived stress, coping strategies, and physical health among a non-clinical sample of adult women. Specifically, this investigation will test the hypotheses that perceived stress and coping strategies independently mediate the link between maltreatment in childhood and physical health problems in later life. Next, the study will explore the moderating role of coping on the relationships between CM, perceived stress, and physical health. This model will be compared to one that examines coping and perceived stress as interrelated mediators of the link between CM and health, with coping operating as an antecedent of

subjective stress. Finally, this study will explore how the various forms of maltreatment differentially relate to physical health outcomes.

### *Definition of Childhood Maltreatment*

It is becoming clear that specific forms of maltreatment may be related to different negative outcomes and that exposure to multiple types of maltreatment puts individuals at greatest risk of problems in later life (Briere, 2002). Accordingly, it is important to differentiate between the various forms of maltreatment and to identify the individuals at risk of abuse-related difficulties. Childhood maltreatment includes physical and sexual abuse, as well as psychological maltreatment, which involves emotional abuse and neglect. According to the Criminal Code of Canada, child physical abuse (CPA) refers to deliberate physical assault by an adult or significantly older or more powerful person that results in, or is likely to result in, physical harm to a child (Ministry of Child and Family Development [MCFD], 2007). The abusive acts can range from relatively low severity (i.e., hitting, slapping) to high severity (i.e., torture, burning, breaking bones), and injuries can include bruising, welts, fractures, or in extreme cases, death (MCFD, 2007).

Child sexual abuse (CSA) occurs when a child is used for the sexual gratification of another person. Behaviours include: touching private or sexual body parts; attempted or completed intercourse (vaginal or anal); threatening sexual acts; making sexual references; and deliberately exposing a child to sexual activity or material (MCFD, 2007). Sexual abuse frequently, but not necessarily, involves physical force or coercion and is thought to be inherently emotionally abusive (Bernstein & Fink, 1998).

Child psychological maltreatment (CPM) has received the least amount of attention compared to other forms of abuse and is the most difficult of these experiences to define. CPM generally refers to “acts of commission (abuse) or omission (neglect), or both, that communicate to the child that he or she is unwanted or unworthy of attention and affection” (Hart, Brassard, Binggeli, & Davidson, 2002). The American Professional Society on the Abuse of Children purports that CPM includes: (a) spurning, hostile rejection, and degradation; (b) exploiting or corrupting; (c) terrorizing; (d) denying emotional responsiveness or ignoring; (e) isolating; and (f) neglect of mental, health, and educational needs (Hart et al., 2002). Glaser (2002) augments this definition by explaining that these behaviours must “pervade or characterize the parent-child relationship,” suggesting that single accounts of such behaviours do not qualify as CPM. Due to the ambiguous, yet pervasive nature of CPM, prolonged psychological maltreatment can go unrecognized and may lead to greater problems than other forms of abuse (Allen, 2008; Glaser, 2002).

#### *Prevalence of Childhood Maltreatment*

Numerous studies have examined the epidemiology of CM in the general community. The most recent Canadian Incidence Study of Reported Child Abuse and Neglect reported a rate of 21.7 cases of substantiated child maltreatment per 1 000 children in 2003. There were an additional 28 251 cases of suspected CM that year (Public Health Agency of Canada [PHAC], 2005). This nation-wide study revealed that neglect was the most common form of maltreatment (30% of all substantiated cases), followed by physical abuse (24%), emotional abuse (15%), and sexual abuse (3%). While girls made up 49% of the victims, they constituted a larger proportion of sexual abuse

(63%) and emotional abuse (54%) cases, whereas boys were more often victims of physical abuse (54%) and neglect (52%).

Rates such as these likely underestimate the prevalence of child maltreatment, however, as they are exclusively based on reported abuse. Population-based studies that use self-report likely reflect more accurate rates of child maltreatment (Finkelhor, Ormrod, Turner, & Hamby, 2005). Lifetime prevalence estimates based on self-report tend to vary between studies, but are generally quite high. It has been estimated that approximately 30% of women and 40% of men have experienced some abuse before the age of 18 (Scher, Forde, McQuaid, & Stein, 2004).

Community-based studies have reported that rates of CPA among women range between 17% and 31%. Rates of CPA for men are generally higher (range of 21% to 37%; Briere & Elliott, 2003; Demaré, 1996; MacMillan et al., 1997; Scher et al., 2004). Reported estimates of CSA for women have varied from 3% to 36% (Finkelhor, 1994; Gorey & Leslie, 1997), but tend to range from 6% to 20% when more conservative measures are used (Dong, Dube, Giles, & Felitti, 2003; Scher et al., 2004; Schilling, Aseltine, & Gore, 2007). Studies consistently demonstrate that women experience higher rates of CSA compared to men (the ratio is approximately 3:1; Trickett, Kurtz, & Noll, 2004). Prevalence rates of CPM appear to be the highest of all abuse types. Community-based studies investigating rates of childhood emotional abuse (i.e., not including acts of omission) among men and women report rates between 11% and 14% (Chapman et al., 2004; Felitti et al., 1998). However, retrospective studies using more inclusive definitions of CPM have found that rates range between 22% and 70% (Finzi-Dottan & Karu, 2006; Grilo et al., 2005; Runtz & Roche, 1999; Vranceanu, Hobfoll, & Johnson, 2007).

Population-based research also demonstrates that the various forms of CM rarely occur in isolation. For example, Dong and colleagues (2003) found that of women with CSA histories, 26% had also experienced emotional abuse, and 46% had also experienced physical abuse. Findings suggest that caution must be exercised when attributing outcomes to a particular form of abuse if other types of abuse have not been examined. Moreover, even though men and women report comparable rates of child maltreatment, there is strong evidence that men and women react differently to these traumatic experiences (Morimoto, & Sharma, 2004; Ullman, & Filipas, 2005). This highlights gender as an important variable in child maltreatment research. In this vein, this study will examine the effects of various forms of CM on physical health in women.

#### *Childhood Maltreatment and Physical Health*

A vast number of studies document child maltreatment as a predictor of psychological problems among women (e.g., Briere & Elliott, 2003). Much less is known about the long-term effects of CM on women's physical health. Recent research suggests that women with histories of CM report significantly greater physical health concerns, medical diagnoses, and health care costs compared to non-victimized women; they also endorse poorer perceptions of their health and greater impairment in their everyday lives due to physical problems (Felitti et al., 1998; Green & Kimerling, 2004; Walker, Gelfand, et al., 1999). These findings highlight the multidimensionality of the physical health construct, which denotes biological and physiological factors, medical conditions, perceived symptoms, general health perceptions, and health-related quality of life. Accordingly, the relationship between CM and physical health can be understood by examining a range of studies that target different facets of health.

The majority of research in the area of CM and health has focused specifically on the effects that child sexual abuse may have on an array of physical problems. For example, CSA has been associated with several medically unexplained syndromes, such as gastrointestinal pain (Drossman, Li, Leserman, Toomey, & Hu, 1996), chronic non-malignant pain (Goldberg & Goldstein, 2000), irritable bowel syndrome (Hobbis, Turpin, & Read, 2002), chronic back pain (McCauley et al., 1997), chronic headaches (Goodwin, Hoven, Murison, & Hotopf, 2003), vaginismus (Reissing, Binik, Khalife, Cohen, & Amsel, 2003), and chronic fatigue syndrome (Taylor & Jason, 2002). Compared to non-victimized women, women with CSA histories also report more chronic diseases, including arthritis and breast cancer, and medical problems, such as respiratory, musculoskeletal, and neurological complications (Golding, 1994; Lechner, Vogel, Garcia-Shelton, Leichter, Steibel, 1993; Stein & Barrett-Connor, 2000). CSA has also been associated with an array of reproductive health problems, such as menstrual symptoms (Runtz, 2002), gynaecological concerns (Sickel, Noll, Moore, Putnam, & Trickett, 2002), and premenstrual dysphoric disorder (Girdler et al., 1998). As might be expected, sexually victimized women also report poorer perceptions of their overall physical health and have increased medical service utilization and costs (Hulme, 2000).

Studies have also documented a relationship between *any* form of CM and physical health problems in adulthood. One important study investigated 1 225 randomly selected women from a large Health Maintenance Organization (HMO; Walker, Gelfand, et al., 1999; Walker, Unutzer, et al., 1999). Women who reported a history of any child physical, sexual, or psychological abuse reported greater health care costs and emergency room visits than women without abuse histories. Previously-abused women also reported

more medical diagnoses in the past year, including pain disorders, hypertension, diabetes, and asthma, as well as increased health-risk behaviours. Other researchers report associations between a history of any CM and poorer perceptions of one's health and increased physical health symptoms (Cloitre, Cohen, & Edelman, & Han, 2001; Messina & Grella, 2006; Moeller, Bachmann, & Moeller, 1993). Importantly, the impact of childhood adversity is cumulative. Women with more severe histories of CM are more likely to experience poorer physical health status (Felitti et al., 1999; Walker, Gelfand, et al., 1999).

Though these studies provide convincing evidence for a relationship between CM and physical health, findings are somewhat limited. Recall that the various forms of CM tend to co-occur. When sexual abuse is examined in isolation, or when all abuse types are collapsed together, it is unclear which aspect of an abuse history impacts physical health. Studies that include physical and psychological maltreatment into their models provide us with a better understanding of the association between CM and physical health outcomes.

#### *Physical and Psychological Maltreatment and Physical Health*

Population-based studies reveal that the various forms of abuse differentially impact chronic medical conditions. Data from 8 000 women interviewed in the National Violence Against Women Survey indicates that after controlling for a history of CSA and revictimization in adulthood, child physical abuse was associated with poorer perceptions of general health and greater likelihood of sustaining a serious injury and using drugs and alcohol in adulthood. CPA, however, was not associated with a risk of acquiring a chronic physical health condition (Thompson, Arias, Basile, & Desai, 2002). Conversely, Springer, Sheridan, Kuo, and Carnes (2007) found that CPA was associated with

increased chronic health conditions in adulthood, including asthma, arthritis, thyroid disease, and urinary problems. This study, however, did not control for a history of child sexual or psychological abuse. Another population-based study demonstrated that chronic pain was more common among those with child physical, but not sexual, abuse histories (Walsh, Jamieson, MacMillan, & Boyle, 2007). Similarly, a study of treatment-seeking men and women found higher rates of CPM and CPA, but not CSA, among individuals with fibromyalgia compared to healthy controls (Van Houdenhove et al., 2001).

Not unlike medical conditions, self-reported physical symptoms seem to be more strongly associated with child physical abuse than sexual abuse. Using a large university sample, Runtz (2002) examined the differential effects of CPA and CSA on women's physical health. After controlling for CSA, CPA was related to increased general physical health symptoms across a range of bodily symptoms (i.e., backaches, flu, abdominal pain, vaginal pain, asthma). However, CSA on its' own and CSA in combination with CPA were related only to premenstrual symptoms. Similarly, Woods and Wineman (2004) found that CPA was uniquely associated with physical health complaints, over and above the effects of CSA and other childhood traumatic experiences. Child psychological maltreatment was not examined in either of these studies.

Research examining functional impairment also demonstrates that CPM and CPA are important predictors of health problems. Historically, functional impairment refers to the extent to which physical health negatively impacts aspects of one's life (e.g., social, occupational; Ware, Snow, Kosinski, & Gandek, 1993). A nationally-representative study in the Netherlands found that CPM, CPA, and total abuse experiences were associated with greater functional impairment; CSA and neglect were not (Afifi et al., 2007). A

study investigating female veterans seeking medical treatment found that CPM uniquely predicted increased role limitations due to physical problems, as well as greater pain and use of pain medication in the past six months. Physical abuse was associated with poorer perceptions of general health (Lang et al., 2006). Finally, recent data from the National Survey of Midlife Development in the United States revealed that women with histories of CPM by a mother or both parents were more likely to report increased functional impairment than women who were not abused. After controlling for a history of CPM, CPA was not associated with functional impairment. The authors concluded that psychological maltreatment is central to understanding the health outcomes associated with early adverse experiences (Irving & Ferraro, 2006).

#### *Summary*

Taken together, research suggests that child maltreatment is a major risk factor for a variety of physical health problems in later life, including greater physical symptoms, functional impairment, and medical service utilization. As the severity of childhood maltreatment increases (e.g., multiple types and greater frequency of abuse), so does the likelihood of poorer physical health. Notably, several methodological issues need to be addressed when interpreting these findings. Firstly, the majority of studies utilize specialized samples, such as medical clinic patients (e.g., Walker, Gelfand, et al., 1999). These samples may over-represent particularly vulnerable individuals and overinflate effect sizes.

Second, several studies fail to include multiple types of abuse into their models, which makes it difficult to determine the causal mechanism of poor health status (e.g., Shaw & Krause, 2002; Thompson et al., 2002). Moreover, definitions and measures of

CM have varied greatly between studies, which make comparisons difficult. Quite a few researchers measure CM dichotomously (e.g., Cloitre et al., 2001), which conceals the severity of the abuse experience.

Finally, several studies utilize single indicators of physical health, often relying on reported diagnosed medical conditions. As the literature illustrates, survivors of CM are experiencing a host of physical difficulties. Outcome measures based on medical diagnoses alone may be obscuring any of the subthreshold difficulties experienced by these women (e.g., pain, sleeplessness, muscles weakness). As endorsed by Wilson and Cleary (1995), comprehensive measures of health provide more meaningful descriptions of physical functioning. The current study will address the aforementioned limitations and recommendation by employing a latent physical health variable comprised of several indicators, as well as comprehensive measures of child physical, psychological, and sexual abuse within a community sample.

#### *The Relationship between Childhood Maltreatment and Physical Health*

Although there is mounting evidence for the link between maltreatment in childhood and physical health problems in later life, the pathway through which these experiences are related is still largely unsubstantiated. The direct relationship between CM and poor health might be explained by acute injuries or sexually transmitted infections acquired during a physical or sexual assault; however, most abuse survivors do not incur such problems (Leventhal, Martine, & Asnes, 2008). A number of studies report that various forms of psychopathology, such as posttraumatic stress disorder (PTSD; Lang et al., 2006; Schnurr & Green, 2004), depression (Golding, 1999), and dissociation (Romans, Belaise, Marin, Morris, & Raffi, 2002) partially explain the relationship

between CM and physical health problems. However, other mediating factors may be equally or more important in this association for a number of reasons. For instance, the variance in psychopathological variables accounted for by child maltreatment appears to be moderate at best (e.g., Golding, Cooper, & George, 1997; Romans et al., 2002; Schnurr & Green, 2004). Moreover, a considerable proportion of abuse survivors do not develop significant psychological difficulties (Haskett, Allaire, Kreig, & Hart, 2008). This suggests that there may be other more normative processes following early traumatic experiences (e.g., specific appraisals and responses) that help to explain the link between child maltreatment and physical health concerns.

One of the most widely cited explanations for physical health problems among the general population is heightened stress and maladaptive ways of coping with stress (Lazarus & Folkman, 1984). Although CM survivors appear to experience greater stress and use less effective coping strategies throughout their lives (Futa, Nash, Hansen, & Garbin, 2003; Schumm, Stines, Hobfoll, & Jackson, 2005), this mechanism has yet to be examined within a population of CM survivors.

#### *Perceived Stress and Physical Health*

Stress has long been considered an important psychosocial influence on physical health. Conceptualizations of stress and its impact on the body have been variable over time and between disciplines. Originating in the field of physics, the notion of stress refers to a mechanical force that acts on the body, capable of producing strain (Harris & Levey, 1975). For physiologists, stress is viewed as an environmental demand or threat that induces physiological arousal. This response might be adaptive (i.e., by motivating a fight or flight response), but may also be harmful to one's health when activated

repeatedly, for prolonged periods of time, or among vulnerable individuals (Endler, 1988; Selye, 1976).

Lazarus and Folkman (1984) greatly advanced stress research by emphasizing the role of *perceived* stress. They assert that for stress to occur and impact one's health, an individual must appraise a situation as threatening or demanding and exceeding his or her adaptive resources (Lazarus & Folkman, 1984). The perception of stress is determined by qualities of the stimulus (i.e., magnitude, intensity, controllability), as well as individual characteristics (i.e., mood, past experiences, personality, and coping skills). Perspectives on stress now generally acknowledge that a stress appraisal is responsible for triggering stress responses (e.g., physiological, behavioural) that may negatively impact physical health. Thus, while certain events are almost universally appraised as stressful (e.g., loss of a loved one), the impact of even these events depend on individuals' interpretations of their environment (Lazarus & Folkman, 1984).

The literature associating stress with physical health problems is vast. These studies predominantly rely on "objective" measures of stress, as in negative life events or circumstances that most people would find stressful. For example, negative life events, such as the death of a child or exposure to a natural disaster, have been related to the development of physical symptoms and diseases, such as cardiovascular disease and cancer (Glaser, 2005; Li, Hansen, Mortensen, & Olsen, 2002). Chronic (persistent) stressors, such as marital discord, caregiving, and work strain, appear to be the most harmful because they are linked with long-term physical health difficulties, including infection, autoimmune problems, disease, and inflammation (Cohen, Frank et al., 1998; Day & Livingstone, 2001; Segerstrom & Miller, 2004). While acute (brief) stressors have

been shown to enhance certain immune processes (Segerstrom & Miller, 2004), increased frequency of time-limited stressors (i.e., car accident, exam, public speaking) can also lead to poorer physical health (Day & Livingstone, 2001; DeLongis, Folkman, & Lazarus, 1988; Evans & Edgerton, 1991; Segerstrom & Miller, 2004).

Psychoneuroimmunologists also tend to utilize objective measures of stress when examining the impact of stress on physiological systems and physical health. Certain physiological processes are particularly reactive following exposure to stressors, such as natural events (e.g., war, victimization) or laboratory tasks (public speaking, timing mental arithmetic; Carpenter et al., 2007; Roelofs & Spinhoven, 2007; Weissbecker, Floyd, Dedert, Salmon, & Sephton, 2006). Accordingly, two neuroendocrine systems are considered the primary indicators of the body's stress response: the hypothalamic-pituitary-adrenocortical axis (HPA) and the sympathetic-adrenal-medullary (SAM) system. Both systems are also implicated in the maintenance of physical health. When exposed to a stressor, the HPA system produces cortisol, a "stress hormone" responsible for the initiation of anti-inflammatory responses and the metabolism of carbohydrates, fats, and proteins. Similarly, catecholamines are released upon SAM system activation, which help regulate cardiovascular, pulmonary, hepatic, skeletal muscle, and immune systems. These systems appear to be quite resilient in the context of acute or controllable stressors (Sapolsky, Romero, & Munck, 2000). However, early, prolonged, or repeated activation of the HPA and SAM systems can permanently hinder their control of these physiological processes and increase risk for physical health problems (Friedman & McEwen, 2004; Roelofs & Spinhoven, 2007).

Both of these bodies of literature provide good evidence for a link between stress and physical health and how this association might be explained physiologically. However, by utilizing “objective” measures of stress, researchers are assuming that negative events are experienced equally across individuals. As aforementioned, the magnitude of perceived stress can be quite variable; a situation may not be appraised as stressful at all for an individual who recognizes it as inherently nonthreatening or has the necessary skills and experience to cope with it (Spielberger, 1976). Accordingly, several researchers emphasize the importance of measuring *perceived* stress opposed or in addition to objective stress when examining the influence of stress on physical health (Cohen, Karmarch, & Mermelstein, 1983; Lazarus & Folkman, 1984).

Consistent with these assertions, several studies have elucidated the significance of measuring perceived stress in the context of physical health. The most common method for examining appraised stress is to have participants rate their global perceived stress, referring to the degree to which one’s life is appraised as stressful, without reference to specific events or stressors (Cohen et al., 1983). This form of stress has been associated with an array of physical health outcomes among different populations. For example, Golden-Kreutz et al. (2005) found that global perceived stress, as well as perceived stress related to one’s diagnosis, negatively impacted the physical health-related quality of life of breast cancer patients. Oleske et al. (2006) reported that higher self-rated stress predicted chronic work-related pain among union employees. Self-perceived stress has also been linked with greater physical symptoms, such as peptic ulcers, fatigue, muscle weakness, and heartburn, within community samples (Anda et al., 1992; Benham, 2006; Weekes, MacLean, & Berger, 2005). Population-based studies

shave found that increased perceived stress is associated with greater distress due to physical problems (Benham, 2006), but is not related to subjective ratings of general health (Gehring, Aubert, Padlina, Martin-Diener, & Somaini, 2001). Interestingly, a longitudinal clinical study revealed that initial subjective stress predicted poorer immune functioning among cancer patients. Moreover, patients exhibiting a decline in perceived stress showed improvement over time (Thornton, Andersen, Crespino, & Carson, 2007), suggesting that stress management might be a critical health promotion tool.

Other measures of perceived stress involve rating the extent to which a specific event is bothersome or threatening. For example, self-rated job insecurity (Hellgren, Sverke, & Isaksson, 1999), work stress (Dahlgren, Kecklund, & Akerstedt, 2005) and stress about one's infertility (Klonoff-Cohen, Chu, Natarajan, & Sieber, 2001) have all been shown to predict poorer physical health outcomes. Certain self-rated stress scales yield a composite score of perceived stress across various stressors (e.g., Daily Hassles Scale; Kanner, Coyne, Schaeffer, & Lazarus, 1981) and also demonstrate the influence of subjective stress on physical health. Self-reported stress pertaining to circumstances including car maintenance, the weather, intimacy, and insufficient money has been linked with greater physical health problems, including disease symptoms, headaches, and gynaecological, respiratory, and gastrointestinal concerns, and a variety of other symptoms (Kim & Seidlitz, 2002; Tatrow, Blanchard, Hickling, & Silverman, 2003; Thakkar & McCanne, 2000). Finally, perceived stress has been associated with increased visits to physicians, as well as to alternative medical services (e.g., Barsky & Borus, 1999; Dobkin, De Civita, Bernatsky, Kang, & Baron, 2003).

Overall, findings suggest that perceived stress is an important determinant of physical health problems. Importantly, perceived stress has been shown to be a better predictor of health-related outcomes compared to objective stressors (Cohen, Karmarch et al., 1983; Pbert, Doerfler, & DeCosimo, 1992; Takkouche, Regueira, & Gestal-Otero, 2001). This suggests that studies using objective measures of stress may be underestimating the strength of the relationship between stress and physical health. They also inaccurately imply that a stressor is, in and of itself, the precipitating cause of illness, instead of a cognitively mediated stress response.

Explanations for how stress impacts physical health tend to vary by discipline, with physiologists emphasizing neurobiological mechanisms and psychologists highlighting cognitive and behavioural pathways. To reconcile these discrepancies, Cohen and colleagues (1997) integrate the various stress perspectives into an organizational framework that contextualizes perceived stress and explains how a multi-stage stress process influences physical health status. They posit that when faced with an environmental demand, individuals appraise whether the demands are threatening and whether they have sufficient adaptive capacities to cope. If the situation is viewed as taxing and beyond their coping abilities, individuals will perceive themselves as stressed. The perception of stress is believed to trigger behavioural responses (i.e., unhealthy coping strategies) or physiological reactions that put individuals at risk of illness.

In addition to the neurobiological and behavioural mechanisms mentioned above, cognitive researchers suggest that perceived stress might also impact physical health through an attentional pathway. Subjective stress can impact how individuals perceive and experience physical symptoms. Stress can enhance self-focused attention, which may

increase awareness of bodily sensations and sensitivity to symptoms (e.g., rapid heartbeat and breathing, sweating). The heightened arousal may convince individuals that their symptoms require medical attention (Kirmayer, Groleau, Looper, & Dao, 2004; Mayer, Naliboff, Chang, & Coutinho, 2001). Another important aspect of the attentional mechanism is somatization: “a tendency to experience and communicate somatic distress and symptoms unaccounted for by pathological findings, to attribute them to physical illness, and to seek medical help for them” (Lipowski, 1988, p. 1358). Moreover, attentional mechanisms can involve decreased attention to medical problems. Under stress, physical problems may go unnoticed and untreated, possibly rendering them more severe (Schnurr & Green, 2004).

In sum, it has been suggested that perceived stress is a critical component of a stress response, in part responsible for whether an environmental demand influences the pathogenesis of physical health problems. Perceived stress might precipitate the development of poor health outcomes through a number of different pathways (e.g., neurobiologically, behaviourally, attentionally). Child maltreatment has long been considered a risk factor for adjustment difficulties in later life, including increased stress and problems managing stress. Consequently, perceived stress may help explain the poor health outcomes associated with child maltreatment.

#### *Perceived Stress as a Mediator between Maltreatment and Health*

Developmental and neurobiological theories suggest that child maltreatment survivors might be more likely to experience greater stress throughout their lives, and consequently be at greater risk of physical health problems. As mentioned above, early adverse experiences, such as CM, can permanently alter the central stress response

system, rendering individuals more reactive to subsequent stressors and susceptible to disease (McEwin, 1998). Moreover, abuse survivors might be more likely to interpret events and interactions as threatening based on their past experiences (Pine, 2003; Schumm et al., 2005). Spaccarelli (1994) also suggests that CM might deplete one's resources for coping with everyday events, thus enhancing the likelihood of experiencing stress throughout life and consequent health problems.

Evidence for the link between child maltreatment and stress in adulthood has primarily stemmed from neurobiological research. Several studies demonstrate that following exposure to laboratory stressors, adult survivors of CM tend to display heightened neuroendocrine stress responses. Researchers conclude that extreme stress early in life, such as CM, creates a biological vulnerability towards subsequent stress (Heim, Newport, Bonsall, Miller, & Nemeroff, 2001; McEwin, 1998). From a stress appraisal perspective, these findings suggest that CM survivors experience events as more threatening throughout their lives and are thus more reactive to stress. Evidence for the latter claim stems from research with the general population, showing that heightened perceived stress predicts disturbances in several biological markers of stress (e.g., cortisol, triglycerides; Goldman, Gleib, Seplaki, Liu, & Weinstein, 2005).

Studies that specifically examine the perceived stress of CM survivors are limited and somewhat inconsistent. Schumm and colleagues (2005) investigated the current perceived stress and psychological health of adult survivors of CM. Stress was defined as the degree to which one experiences resource losses in personal (e.g., self-esteem), instrumental (e.g., finances), material (e.g., car), and social domains. They found that severity of child sexual abuse, but not physical abuse, predicted heightened subjective

stress among women. Moreover, perceived stress mediated the link between maltreatment and PTSD and depression symptoms. Another study examined the subjectively appraised stress and emotional reactivity towards perceived stress within a sample of women who had or had not experienced severe sexual or physical abuse as children (Glaser, van Os, Portegijs, Myin-Germeys, 2006). While severe CM predicted stronger emotional reactions towards stress in adulthood, overall levels of perceived stress did not vary between victimized and non-victimized women. Studies utilizing less stringent definitions of CM, however, have found that CM significantly predicts greater perceived stress in adulthood (Bell & Belicki, 1998; Hyman, Paliwal, & Sinha, 2007).

Despite theoretical and empirical support for links between CM, subjective stress, and physical health problems, few studies have explored the interrelationship among these variables. A number of studies report that lifelong dysregulations of the physiological stress response associated with CM are also linked with physical health problems in adulthood (Kendall-Tackett, 2000; Weissbecker et al., 2006). Cromer and Sachs-Ericsson (2006) found that increased negative life events in adulthood (e.g., break-up, death of a close friend, unemployment) more than doubled the likelihood of poorer physical health among women with histories of child sexual or physical abuse, even after controlling for PTSD.

Thakkar and McCanne (2000) conducted the only study to date on the perceived stress and physical health problems of CM survivors. They found that female undergraduate students with CSA histories were more likely to exhibit greater physical symptoms (e.g., gynaecological, respiratory, gastrointestinal) in the few days preceding a subjectively stressful event than those who had not been abused. Unexpectedly,

previously abused did not report higher levels of daily stress. Results suggest that abused women may be particularly susceptible to the effects of daily perceived stress on physical health, but may not actually experience events as more stressful. Similar to Glaser et al.'s (2006) study, a restrictive measure of CM may be obscuring the full relationship between CM and perceived stress. More research is necessary to confirm these links.

Overall, there is good evidence that perceived stress influences the development of physical health problems. There are also strong theoretical assertions for why CM survivors might experience greater stress throughout their lives and be more vulnerable to the effects of stress. Empirical research is beginning to substantiate this link. Taken together, perceived stress might help to explain the effects of CM on physical health concerns. To date, no study has examined perceived stress as a mediator in the relationship between the various forms of CM and a range of physical health problems.

#### *Coping with Stress and Physical Health*

Since the inception of coping research over 40 years ago, coping has been regarded as an integral component in the relationship between stressful events and physical health status (e.g., Lazarus, 1966). Coping refers to a person's cognitive and behavioural efforts to manage (e.g., minimize, master, or tolerate) internal or external demands that are appraised as stressful (Lazarus & Folkman, 1984). Coping strategies are generally considered to have two major functions: dealing with the problem causing the distress (e.g., problem-focused coping) and regulating the emotion associated with the stressful event (e.g., emotion-focused coping). Problem-focused coping involves direct efforts to alter the situation, as well as rational efforts to analyze and solve the problem at hand. It may include breaking down a problem into more manageable pieces, cognitively

restructuring the problem, considering alternatives, attempting to alter the situation, or obtaining advice or support from others. Alternatively, emotion-focused coping strategies are emotional reactions that are self-oriented. Reactions include emotional responses (e.g., self-blame, getting angry, becoming tense), self-preoccupation, fantasizing about being in another situation, or more positive reactions, such as acceptance, self-control, and being optimistic (Endler & Parker, 1990a; Lazarus & Folkman, 1984). In some cases, emotion-focused coping attempts can actually increase stress (e.g., become upset or tense). Other researchers have proposed a third basic dimension of coping, avoidance, which can be either task- or person-oriented (Billings & Moos, 1984; Endler & Parker, 1990a). Avoidance entails engaging in alternative activities (e.g., substance use, shopping, eating) or cognitive changes (e.g., distancing, numbing) to distract oneself from stress and associated negative emotions.

Coping is typically operationalized in the literature one of two ways. The process approach assumes that coping is flexible and responsive to environmental demands (Lazarus & Folkman, 1984). Thus, researchers may examine how one copes with a particular stressor or whether coping behaviours change between stressors. Alternatively, others define coping as a trait-like style for confronting and dealing with problematic situations. From this perspective, individuals are classified according to their typical manner of coping, based on an index of general coping techniques used across stressful situations (e.g., Endler & Parker, 1990c). Both coping approaches have received criticism, the former for being too unstable across time, and the latter for ignoring context (Endler & Parker, 1990a; Lazarus & Folkman, 1984). Moreover, neither perspective

acknowledges that coping responses may not be mutually exclusive, when in fact they can co-occur in stressful situations (Carver & Scheier, 1994).

Despite these methodological differences, theorists generally agree that coping strategies differentially influence psychological and physical well-being (e.g., Billings & Moos, 1984; Endler, 1988; Lazarus & Folkman, 1984; Spaccarelli, 1994). Problem-focused coping (i.e., creating a plan of action, asking for advice) can be stressful and demanding in the short-term, but it is associated with better mental health in the long run. Conversely, increased reliance on avoidance coping strategies can have short-term benefits (e.g., suppression of stress), but are related to poorer psychological adjustment over time (Campbell-Sills, Cohan, & Stein, 2006; Endler & Parker, 1990a, 1990b). The impact of emotion-focused coping strategies tends to vary depending on the type of emotion-focused coping being used. More adaptive strategies, such as positive reappraisal, acceptance, and optimism, have been linked with decreased psychological distress (Greenglass & Burke, 1991). Alternatively, negative forms of emotion-focused coping, such as rumination, self-blame, and becoming tense, are associated with greater mental health problems (McWilliams, Cox, & Enns, 2003).

Though fewer, studies on coping and physical health generally produce similar results. Most research on coping and physical health focuses on how coping with the stress of illness impacts the progression of various medical diseases. Cross-sectional and longitudinal studies show that using problem-focused coping to deal with one's illness, such as planful problem-solving, having a fighting spirit, and cognitive reframing, are associated with decreased AIDS symptoms and slower HIV progression, longer survival from and less recurrence of cancer, and decreased arthritis-related pain (Newth &

DeLongis, 2004; Petticrew, Bell, & Hunter, 2002; Temoshok, Wald, Synowski, & Garzino-Demo, 2008). Conversely, emotion-focused and avoidance coping pertaining to one's illness have been associated with greater arthritis-related pain, increased AIDS symptoms, and the development of symptoms in asymptomatic HIV-positive individuals (Affleck et al., 1999; Stein & Rotheram-Borus, 2004; Temoshok et al., 2008). In addition, greater use of helplessness, avoidance, and repression when coping with disease have been linked to increased side effects following chemotherapy, higher chance of cancer-related death, and quicker progression of cancer (Molassiotis, Van Den Akker, Milligan, & Goldman, 1997; Shapiro et al., 1997; Weighs, Enright, Simmens, & Reiss, 2000).

Though earlier studies yielded inconsistent findings on the relationship between coping and self-reported physical symptoms (see review by Penley, Tomaka, & Wiebe, 2002), more methodologically-sound studies have recently substantiated this link. Community-based research shows that greater problem-focused coping predicts better self-rated health, health satisfaction, and fewer health problems (Poetz, Eyles, Elliott, Wilson, & Keller-Olaman, 2007; Wilson, Pritchard, & Revalee, 2005). Alternatively, avoidant coping has been positively associated with physical ailments for adolescents (Wilson et al., 2005). In addition, Leitschuh (1999) found that avoidance coping through the use of drugs or alcohol and emotion-focused coping (e.g., self-blame) predicted poorer self-reported physical symptoms and medical histories among undergraduate students. There is also emerging evidence that religiosity, deemed both a problem-focused and a positive emotion-focused approach, can benefit one's health (e.g., Krause, 1998). Avoidance coping has also been related to decreased medical service utilization, while problem-focused coping has the opposite effect (Miller and Cronan, 1998).

In summary, there is strong evidence for a direct relationship between various coping strategies and physical health problems. Problem-focused coping is generally depicted as an adaptive response to stress because it predicts better disease outcome and self-rated physical health, while emotion-focused and avoidance coping appear to be more maladaptive stress reactions by leading to poorer health status.

As previously mentioned, harmful behavioural responses to stress are a key mechanism through which stress is thought to impact physical health (Cohen, Kessler et al., 1997; Lazarus & Folkman, 1984; Schnurr & Green, 2004). To elaborate, individuals who tend to be more problem-focused are thought to take more appropriate action when faced with a demand. Conversely, avoidance of a problem or being emotion-focused may impact health by impeding one's self-care, attention to worsening symptoms, or adherence to treatment regimes. Furthermore, problem solvers may have a greater sense of control and associated positive affect in the face of stress. While avoidant strategies might provide temporary relief, they can ultimately exacerbate feelings of distress, depression, or anxiety. The negative affect itself could be an indirect pathway through which avoidant and emotion-focused coping contributes to poor health (Schnurr & Green, 2004; Spaccarelli, 1994). Finally, those who use avoidant and emotion-focused coping are more likely to engage in health-risk behaviours (e.g., substance use) as a means of escape, which also might serve as an indirect pathway for coping to impact health (Rheingold, Acierno, & Resnick, 2004).

#### *Coping as a Mediator between Child Maltreatment and Health*

Given the distressing nature of child maltreatment experiences, the coping strategies of CM survivors and their impact on health have warranted investigation.

Several theories posit that child maltreatment influences the development of maladaptive coping techniques, which can then influence poor health status. One explanation is that abuse survivors may develop avoidance or emotion-focused methods of coping to provide some temporary emotional relief from the shame and helplessness evoked by their victimization (Briere, 2002; Runtz & Schallow, 1997). These strategies can become reinforced for being functional at the time, but may later create problems for physical health (Widom, 2000). In addition, CM survivors may develop avoidant or emotion-focused coping styles to manage any psychopathological symptoms (i.e., PTSD, depression) that may develop after an extensive abuse experience (Follette, Polusny, Bechtle, & Naugle, 1996).

Other researchers suggest that coping with extreme stress, such as CM, can exhaust a person's psychological resources needed for effective coping; maladaptive coping strategies can then become dominant responses to stress (Hobfoll, Freedy, Green, & Solomon, 1996). Finally, Hitchcock (1987) proposed that adults who have been physically abused as children may be at a particular disadvantage when facing later stressors. She posited that parents who cope with frustration through aggression model inappropriate coping for their children and fail to provide examples of adaptive coping. In summary, there are good reasons to believe that maltreatment experiences in childhood might provoke greater reliance on maladaptive coping strategies throughout life.

A considerable amount of research supports the theoretical assertion that CM survivors utilize more avoidant and emotion-focused coping and less problem-focused coping strategies throughout their lives. Several researchers demonstrate that women with histories of CM are particularly likely to rely on health-risk behaviours as means of

avoidance coping, such as the use and abuse of substances (Felitti et al., 1998; Rheingold et al., 2004). Moreover, Futa et al. (2003) found that women used more distancing and self-blame when coping with memories of child abuse compared to non-abused women coping with other painful childhood memories. The abused women also reported less problem-focused coping responses, such as social support seeking and emphasizing the positive. Similarly, Gibson and Leitenberg (2001) found that women with a history of child sexual abuse were more likely to use avoidant coping to deal with adult sexual assault than female college students without this history. The authors' follow-up study confirmed this relationship in the context of everyday stressors. They reported that greater exposure to abuse (including sexual and physical abuse, witnessing violence, and parental rejection) was associated with increased reliance on disengagement methods of coping with a recent non-abuse-related stressor (Lietenberg, Gibson, & Novy, 2004). Moreover, CSA specifically (Gipple, Lee, & Puig, 2006) and CM in general (Hyman et al., 2007) have predicted greater use of avoidance coping with current life stressors. Finally, child psychological maltreatment has been found to uniquely predict greater use of avoidance coping with current stressors (Caples & Barrera, 2006) and less frequent use of social support seeking and problem-focused coping with a past traumatic event (Gipple et al., 2006).

Given the potentially harmful consequences of maladaptive coping strategies, researchers have investigated whether the coping strategies of CM survivors account for poorer health outcomes. Most of this research examines how coping with trauma impacts mental health outcomes (e.g., Bal, van Oost, de Bourdeaudhuij, & Crombez, 2003; Coffey, Leitenberg, Henning, Turner, & Bennett, 1996; Runtz & Schallow, 1997;

Vranceanu et al., 2007). However, coping strategies have also been shown to mediate the association between CM and physical health status. For instance, Romans and colleagues (2002) found that greater use of maladaptive strategies for coping with trauma (e.g., distancing and numbing) predicted more severe medical conditions among abuse survivors. Lawler, Ouimette, and Dahlstedt (2005) examined how women with trauma histories (e.g., child sexual abuse, death of a parent, natural disaster) cope with their stressful pasts as well as their current physical health. Avoidance of one's traumatic past mediated the link between a traumatic event and current physical health problems. However, the use of avoidant coping to deal with one's health problems did not account for the relationship between trauma severity and health status. Null findings may be due to sample size limitations or the use of a single collapsed category for all trauma types. Finally, child maltreatment survivors who are able to find meaning from their traumatic past exhibit better reproductive health outcomes compared to those who use less of this adaptive coping strategy (Eadie, Runtz, & Godbout, 2008).

Overall, there is emerging evidence that CM influences the development of avoidance and emotion-focused coping strategies, which in turn predict poorer health status among women. CM survivors who utilize more problem-focused coping strategies are more likely to have better health. More research is necessary to confirm these findings in relation to physical health outcomes. The existing research is heavily focused on how CM survivors cope with their traumatic histories. Though important, it is also necessary to understand how CM survivors cope with a variety of stressors throughout their lives. These women may be increasingly at risk of physical health problems as they encounter new stressors.

A major limitation to coping research in general is the overreliance on objective measures of stress. Recall that coping is defined as one's responses to the appraisal of stress. Only once stress is perceived and ineffective coping strategies are employed, are negative events considered harmful to one's health (Cohen, Kessler et al., 1997; Lazarus & Folkman, 1984). Incongruously, studies that examine the impact of coping with stress on health rarely assess whether the stressor in question is *perceived* as stressful. Instead, researchers tend to examine how one copes with an objective stressor, which may be perceived as stressful to varying degrees, or not at all, by individual participants. Integrating perceived stress into models of coping with stress and health is essential for understanding how stress and coping work together to predict health status; self-reported perceived stress and coping strategies can more accurately reflect individual differences in appraisals and responses.

#### *Stress, Coping, and Physical Health*

Although the literature describes perceived stress and coping strategies as inseparable determinants of health status, there have been surprisingly few attempts to examine how these variables work together. Considerable disagreement exists over how best to conceptualize the interrelationship between stress and coping. One hypothesis is that coping *mediates* the relationship between perceived stress and health outcomes (e.g., Thompson, Gil, Burbach, Keith, & Kinney, 1993). Indeed, some studies have supported this indirect effect, suggesting that when perceived stress is high, individuals are more likely to utilize avoidant and emotion-focused coping strategies and less likely to use problem-focused coping strategies, which can lead to physical health problems (e.g., Diong et al., 2005; Stein & Rotheram-Borus, 2004; Wadsworth & Compas, 2002).

Other researchers (e.g., Holmbeck, 1997) argue, however, that coping can more appropriately be considered as a *moderator* of stress. Holmbeck posits that the degree of perceived stress does not generally influence the selection of a particular coping strategy. Rather, the impact of stress on health is thought to depend on the level or type of coping strategy that is employed. For instance, high levels of stress are expected to produce poor health outcomes only when an adaptive coping strategy is ignored or when a harmful coping strategy is exercised. Despite these assertions, the moderational role of coping has received inconsistent support. A number of studies have found that coping strategies differentially influence the relationship between stress and mental health, with problem-focused coping buffering and avoidant and emotion-focused coping exacerbating the effects of stress (e.g., Treharne, Lyons, Booth, & Kitas, 2007). Day and Livingstone (2001) examined the interaction effects of acute and chronic work-related stressors and a variety of coping strategies on the physical health of military personnel. While they did not find a moderating effect for any problem-focused coping techniques, emotion-focused and avoidance coping were associated with greater physical health problems in the context of increased stress. Moreover, others have reported that coping moderates the relationship between perceived job stress and job satisfaction, but does not buffer or enhance stress effects on physical health (Kirkcaldy, Cooper, & Brown, 1995). There is also some evidence that coping moderates the effects of early, and extreme, life stress, such as maltreatment, on subsequent functioning. Haden and colleagues (2007, 2008) and Gonzales and colleagues (2001) for example, report that following victimization experiences, high disengagement coping and low problem-focused coping predict greater psychological distress and physical health problems among girls and young women.

Researchers have suggested that coping may serve as a mediator or moderator depending on the type of coping and the type of stress in question. For instance, Holmbeck modified his argument by positing that early and chronic traumatic stress, such as child maltreatment, can lead to the development of persistent maladaptive coping strategies, which can, in turn, impact health (i.e., mediation). This claim is consistent with findings that CM predicts greater use of avoidant and emotion-focused coping strategies throughout life (e.g., Briere, 2002; Spaccarelli, 1994). Alternatively, how one copes with a current stressor might be context-specific, as opposed to being a function of the stress itself, and may thus interact with stress to predict health status (Lazarus & Folkman, 1984).

A related perspective on stress and coping proposes that coping strategies influence the extent to which one experiences stress. Accordingly, stress is considered as a mediator in the relationship between coping and health. This hypothesis stems from transactional models of stress and coping, which posit that individuals' reactions to their environments can actually create more stressful situations (Lazarus and Folkman, 1984; Spaccarelli, 1994). A number of studies have supported this model. For instance, problem-focused coping strategies (positive reappraisal, seeking social support) have been shown to predict lower levels of perceived stress among women with chronic injuries. Conversely, avoidance and emotion-focused coping have been strongly related to increases in perceived stress (Lequerica, Forch-Heimer, Tate, & Roller, 2008). Haritatos, Mahalingam, and James (2007) found that decreased perceived stress fully mediated the relationship between high effort problem-focused coping and better physical functioning and fewer somatic symptoms and partially mediated the effects of positive

coping on self-rated health. Similarly, greater problem-focused coping (e.g., perceived control) has been associated with decreased perceived stress among university students, which in turn predicted better self-rated health and illness symptoms. Interestingly, this relationship was stronger for women than it was for men (Hall, Chipperfield, Perry, Ruthig, & Goetz, 2006). These findings suggest that problem-focused coping can be stress-reducing, which increases the likelihood of better health outcomes. Alternatively, avoidant and emotion-focused coping seems more likely to predict greater perceived stress, which can influence poorer health outcomes.

Taken together, there appears to be two theoretically-based explanations for how stress and coping might help explain the link between child maltreatment and physical health. Firstly, coping might serve as a moderator of the effects of CM and perceived stress on subsequent functioning. Next, there is mounting evidence for links between early adverse experiences and the development of maladaptive coping strategies, as well as between ineffective coping and subsequent perceived stress. Therefore, coping strategies might serve a mediating role in the relationship between CM and perceived stress, which in turn predict health status. To date, no study has examined either of these multivariate models.

#### *Overall Summary*

In summary, there is accumulating support for the relationship between the various forms of childhood maltreatment and several physical health concerns, including greater self-reported physical symptoms, increased functional impairment, and higher rates of medical service utilization (Irving & Ferraro, 2006; Runtz, 2002; Walker, Gelfand, et al., 1999). The mechanisms linking CM and physical health status are still

largely unsubstantiated. There is good evidence that child maltreatment survivors experience greater stress throughout their lives (Schumm et al., 2005). Increased perceived stress is consistently implicated as a predictor of physical health problems (Cohen et al., 2007). This suggests that perceived stress might help explain (i.e., mediate) the relationship between CM and physical health status; to date, no study has tested this hypothesis.

A considerable amount of research suggests that CM survivors are more likely to utilize less problem-focused and more avoidant and emotion-focused coping strategies throughout their lives. These coping strategies appear to differentially influence physical health outcomes. Accordingly, coping may also help to explain the relationship between CM and health concerns.

Theoretically, perceived stress and coping strategies work together to predict physical health outcomes and may jointly explain how CM impacts physical health status. Surprisingly few studies have examined these variables in an integrative model; hence, further testing of the interrelationships among these variables is warranted. Plausible mechanisms include: (1) perceived stress serves as a mediator in the link between child maltreatment and physical health outcomes, while coping strategies moderate the influences of child maltreatment and perceived stress on physical health (i.e., moderated mediation model); and (2) CM influences greater avoidant and emotion-focused coping and less problem-focused coping, each of which predicts increased perceived stress. In turn, greater stress leads to poorer physical health status (i.e., multi-mediation model).

Present Study

The present study will investigate associations among maltreatment in childhood, perceived stress, coping strategies, and physical health in a non-clinical sample of adult women. The primary goal of the study is to compare various mechanisms through which perceived stress and coping strategies explain the link between CM and physical health outcomes using structural equation modeling (SEM). Hypothesized and explored models are presented in Figures 1-4. The majority of CM research investigates the impact of sexual abuse or the cumulative effect of all experienced abuse without differentiating among the various forms of maltreatment. Therefore, an advantage to this study is its examination of the impact of physical, sexual, and psychological maltreatment on health.

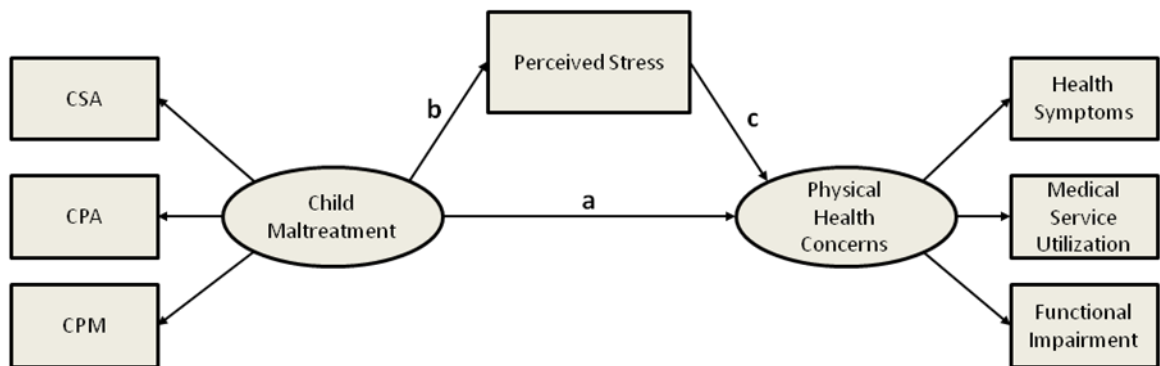


Figure 1. Hypothesized model of perceived stress as a mediator in the relationship between child maltreatment and physical health concerns.

Note. The components represented by rectangles are measured variables, while the components represented by circles are latent variables.

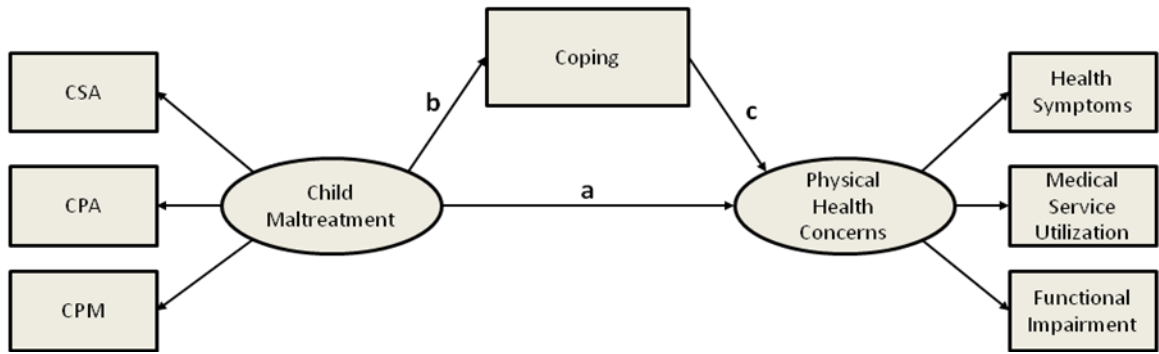


Figure 2. Hypothesized model of coping strategies as a mediator in the relationship between child maltreatment and physical health concerns.

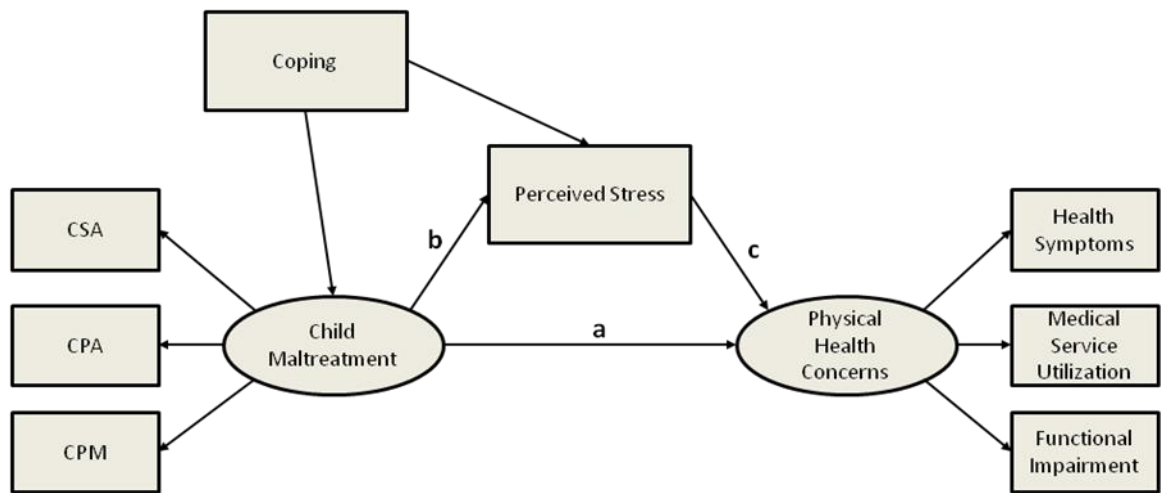


Figure 3. Investigated moderated mediation model. Perceived stress mediates the direct relationship between predictor (child maltreatment) and outcome (physical health concerns). Coping strategies moderate the effects of child maltreatment and perceived stress. Arrows extending from coping symbolically demonstrate its impact on other variables and do not represent regression paths.

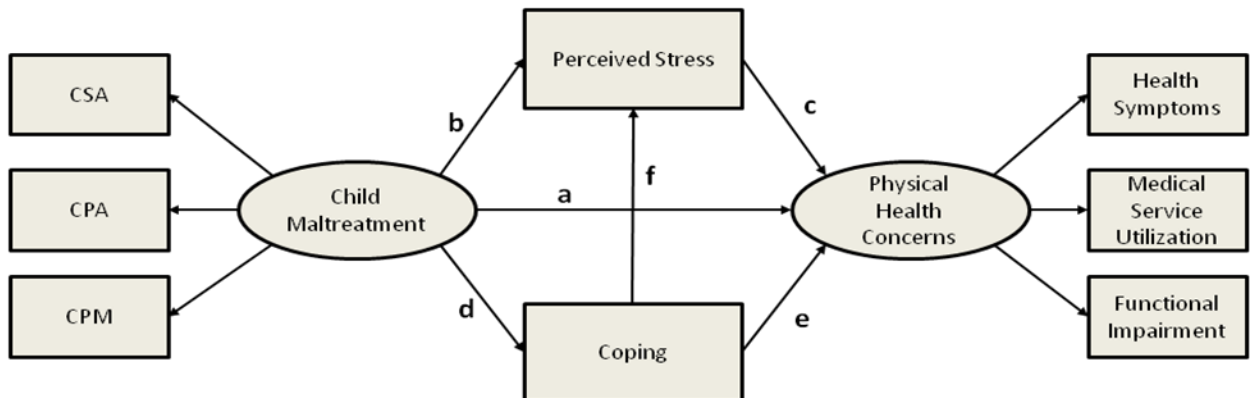


Figure 4. Investigated model of coping strategies and perceived stress as mediators in the link between childhood maltreatment and physical health outcomes.

*Hypotheses*

1. When compared to women with no child maltreatment, CM survivors will exhibit greater physical health concerns as indicated by self-reported physical symptoms, functional impairment, and medical service utilization.
2. Perceived stress will serve as a mediator in the relationship between CM and self-reported physical health concerns.
3. Each coping strategy (problem-focused, emotion-focused, and avoidance) will mediate the association between CM and physical health status.

*Research Questions*

1. How do perceived stress and coping strategies operate together to explain the association between child maltreatment and physical health outcomes? The following two models will be tested and compared:
  - a) The extent to which CM and perceived stress influence subsequent functioning will depend on the extent to which coping strategies are effective. Specifically, CM and perceived stress may be stronger predictors of physical health concerns for those who use less problem-focused or more avoidant and emotion-focused coping strategies (moderated mediation; Figure 3).
  - b) Coping strategies and perceived stress will operate as interrelated mediators in the relationship between CM and physical health concerns. In particular, an indirect pathway from CM to physical health through coping strategies and subsequently perceived stress will be tested (multi-mediation; Figure 4).
2. Are child maltreatment types (e.g., sexual, physical, psychological) differentially associated with physical health outcomes?

## Methods

### *Participants*

Participants included in the current study were part of a broader, SSHRC funded research project, the Women's Health and Relationships Study (WHRS), which investigated the impact of women's victimization experiences on physical and mental health (Runtz, 1998; Roche, 2000). The total sample consisted of 260 women who responded to recruitment notices posted throughout Victoria, British Columbia, including the university and offices of health care professionals. The data from 16 participants were removed prior to analyses due to missing data on entire scales of interest. Respondents over the age of 60 ( $n = 9$ ) were also excluded because physical health problems associated with older age could confound the study's hypothesized relationships.

The remaining 235 participants had a mean age of 37.10 years ( $SD = 10.96$ ), with a median age of 37.0 years; 86% were under age 50. Most women reported that they were Canadian citizens (95%) and heterosexual (87%). Over 90% of participants identified their racial background as Caucasian. Small numbers of First Nations, Asian, East Indian, and African Canadian made up the remaining 8%. Three relationship statuses were equally represented: single/never married, married/cohabiting, and divorced/ separated.

The median annual household income fell between \$20 000 and \$29 000, with 8% of the sample earning over \$70 000 annually, and 16% earning less than \$10 000 each year. In 70% of the cases, either one or two people were dependent on the reported income. The median category for the highest level of education received was some university education. Approximately half of the participants' mothers and fathers

achieved at least a high school diploma. Demographic details for this sample are presented in Table 1.

### *Procedures*

Recruitment of participants for the WHRS was conducted primarily through the offices of physicians, psychologists, social workers, and counsellors in the Greater Victoria area. Health care professionals were sent letters requesting that they post recruitment notices and brochures about the study in their offices. The study was advertised as a confidential and anonymous examination of women's health and stressful life events, including issues such as child abuse and physical and emotional concerns. Advertisements were targeted at women 18 years of age or older who were offered reimbursement of \$25 for their participation, as well as the option of entering a draw for an additional monetary reward (3 prizes of \$100 each). See Appendix A for the letter to professionals and Appendix B for the recruiting poster.

Respondents to the recruitment notices were initially screened by phone to exclude those currently in a crisis situation, or who had recently experienced a psychiatric hospitalization or recently received treatment for a substance abuse problem. During this assessment, those who were eligible to participate were informed about the study's details, including the sensitive and personal nature of the questions, their right to refuse to answer questions or withdraw from the study at any time, and the confidentiality of all their responses. Of a total of 330 initial respondents, 12 women were excluded following the telephone screening, and an additional 58 volunteers did not attend their appointments for testing.

Table 1

*Demographics of the Participants*

Variable	<i>N</i>	<i>n</i>	%
Marital status	235		
Single		86	36.6
Married		45	19.1
Common-law		33	14.0
Separated		20	8.5
Divorced		50	21.3
Widowed		1	0.4
Sexual Orientation	235		
Heterosexual		205	87.2
Lesbian		14	6.0
Bisexual		15	6.4
Other		1	0.4
Citizenship	235		
Canadian		223	94.9
Other		12	5.1
Racial Affiliation	234		
Caucasian		216	91.9
First Nations		5	2.1
Black		1	0.4

*Table continues*

Variable	<i>N</i>	<i>n</i>	%
Asian		3	1.3
Indian		1	0.4
Mixed		8	3.4
Education	235		
Professional degree		34	14.5
College graduate		52	22.1
1-3 years college		98	41.7
High School graduate		35	14.9
10-11 years		14	6.8
<10 years		2	.9
Income	226		
<10 000		38	16.2
10 000 – 19 999		53	22.6
20 000 – 29 999		30	12.8
30 000 – 39 999		30	12.8
40 000 – 49 999		17	7.2
50 000 – 59 999		22	9.4
60 000 – 69 999		11	4.7
70 000 or more		18	7.7

The remaining 260 participants met with trained research assistants at the University of Victoria for approximately 2 to 3 hours each. Participants reviewed and signed documents indicating their understanding of the study and their rights as participants, as well as their informed consent to participate. See Appendix C for the Informed Consent Form and Appendix D for the Information to Participants sheet. Participants then took approximately 60 to 120 minutes to fill out a battery of questionnaires, followed by a 90-minute semi-structured interview. The interview assessed demographic information and victimization experiences. All interviews were conducted by Dr. Runtz or by a trained psychology doctoral student. Interviews were audiotaped so that multiple researchers could rate and agree upon coding of abuse variables. Research assistants were instructed to terminate testing should a participant become overly distressed during the session; however this procedure was never required.

Following the interviews, participants were debriefed about the study's purpose. At this time, the interviewer answered any of the participant's questions, assessed the level of distress or discomfort experienced by the participant, and provided a written debriefing sheet and list of available mental health community resources (see Appendix E and F). Participants were then paid for their participation and offered the opportunity to enter a contest for prizes to be drawn at the end of the WHRS data collection. Participants were also reimbursed for their bus fare if required.

### *Measures*

The portions of the interview and questionnaires used for this study are described below. Descriptive statistics for each continuous measure are provided in Table 2.

Table 2

*Descriptive Statistics for Main Variables*

Measure	<i>M</i>	<i>SD</i>	Range
CPA	8.37	13.93	0-128
CPM	71.08	27.01	32-153
Perceived Stress	26.97	9.31	2-53
Problem-focused Coping	55.76	10.63	21-80
Emotion-focused Coping	44.75	11.72	16-78
Avoidance Coping	20.70	5.58	5-25
Health Symptoms	46.58	29.71	3-249
Medical Service Utilization	6.15	3.33	0-16
Functional Impairment	17.71	7.87	7-35

*Note.* CPA = child physical abuse; CPM = child psychological maltreatment.

### *Demographics*

Participants were asked a series of demographic questions regarding their age, marital status, sexual orientation, citizenship, racial identity, education, and income. See Appendix G for the portion of the demographic interview used in this study.

Demographic information is presented above in the section on participants.

### *Victimization Experiences*

*Physical Abuse Questionnaire* (PAQ; Demaré, 1992). The PAQ is a retrospective self-report measure of child physical abuse. The scale has 16 items intended to represent a broad range of behaviours that professionals consider to be physically abusive.

Participants were asked to endorse whether, before the age of 18, they had experienced any of the listed behaviours as perpetrated by their mother, father, or other parental

figure. Items were rated on a 5-point Likert-type scale ranging from 0 (never) to 4 (very often). The PAQ items range from relatively low severity (e.g., hitting or slapping) to moderate severity (e.g., bruising, punching) to high severity (e.g., physical torture, breaking of bones, burning). A Severe Physical Abuse subscale can be obtained (6 items; see Appendix H). Total scores on the PAQ can range from 0 to 192 (maximum score of 64 for CPA by mother, father, and other parental figure). In our sample, total scores for the PAQ ranged from 0 to 128, with a mean score of 8.37 ( $SD = 13.93$ ). For the Severe Physical Abuse subscale, our sample yielded a mean score of 1.08 ( $SD = 5.17$ ).

An initial examination of the PAQ's reliability in a large undergraduate sample yielded an alpha reliability coefficient of .89 for the total PAQ and .74 for the 6-item Severe Physical Abuse subscale (Demaré, 1996). In the present sample, Cronbach's alpha was .95 for the full scale and .94 for the severe CPA subscale.

*Psychological Maltreatment Questionnaire* (PMQ; Demaré, 1992). The PMQ is a retrospective self-report measure that assesses child psychological maltreatment. In this study, psychological maltreatment refers to various types of parental behaviours that are thought to be emotionally damaging to children. Participants indicate on a 5-point scale ranging from 1 (never) to 5 (very often) the frequency with which they experienced any of 72 behaviours before the age of 18 by one or more of their parental figures.

The PMQ consists of 12 subtypes of psychological maltreatment (6 items each) that are consistent with other widely-held psychological maltreatment classifications (i.e., APSAC, 2002). This study used an abbreviated version of the PMQ for brevity (PMQ – Short Form; 32 items total) that includes representative items from each of the 12 subtypes. The subtypes include: *controlling/stifling independence* (e.g., totally

disregarding your input into decisions that affected you); *corrupting* (e.g., permit or encourage you to tell lies); *degrading* (e.g., criticize or shame you in front of other people); *denying emotional responsiveness* (e.g., appear to be disinterested in you); *exploiting* (e.g., make you cater to their desires with little concern for your own comfort); *isolating* (e.g., refuse to allow you to participate in activities organized by a school or community organization); *physical neglect* (e.g., fail to provide adequate clothing for you even though they had the means to do so); *physical terrorism* (e.g., break one of your possessions in order to “hurt” you); *rejecting* (e.g., tell you they would be happier without you); *unreliable and inconsistent care* (e.g., have unpredictable and changing expectations of you); *verbal terrorism* (e.g., threaten to give you a beating); and *witness to violence* (i.e., physically harm a member of your family when you were present).

Total scores on the PMQ – Short Form can range from 32 to 160. In this sample, scores ranged from 32 to 153 with a mean of 71.08 ( $SD = 27.01$ ). Excellent internal consistency has previously been reported for the full scale ( $\alpha = .97$ ; Demaré, 1996) and was found to be similar for the short form within the current sample ( $\alpha = .96$ ). The PMQ is provided in Appendix I. The correlation between the PMQ – short form and the original 72 item scale is .98 (D. Demaré, personal communication, May 11, 2001).

*Child sexual abuse (CSA)*. A semi-structured interview designed specifically for the WHRS was used to assess early sexual victimization experiences. Questions were largely based on well-validated questionnaires that assess sexual abuse (e.g., Traumatic Antecedents Questionnaire, Herman & van der Kolk, 1990); the interview format used here allowed for a more comprehensive assessment of the nature of these experiences (See Appendix J). To assess for the severity and nature of a history of CSA, participants

were asked about their non-consensual sexual experiences as a child, including their relationship to the perpetrator, how often the experience occurred, age when abuse occurred, use of force, physical violence, and/or coercion, whether the experience was kept secret, and how upset they were by the experience. CSA was defined as: 1) sexual contact (fondling of sexual body parts, oral-genital contact, or attempted or completed intercourse) between a child who was 17 years-old or younger and a person who was 5 or more years older, or 2) sexual contact or behaviour between a child and a person who was not 5 years older, but who used force or threats to get the child to participate. Consensual sexual activity between peers and mild forms of unwanted sexual activity (e.g., exposure from a distance by a stranger) were not considered to be CSA in this study. Data were collected for up to five independent incidents of child sexual abuse for each participant. The majority of participants experienced only one or two incidents of CSA. For the purposes of the present study, participants were categorized dichotomously on this variable based on whether or not they had experienced CSA.

### *Perceived Stress*

*Perceived Stress Scale* (PSS; Cohen et al., 1983). The PSS is among the most widely used self-report measures of stress. The scale is comprised of 14 items that assess the degree to which recent life situations are generally appraised as stressful (see Appendix K for sample items). Participants were asked to indicate how often they had certain types of thoughts, feelings, or reactions in the past month (e.g., “in the last month, how often have you been upset because of something that happened unexpectedly?” or “in the last week, how often have you found that you could not cope with all the things that you had to do?”). Items are ranked on a five-point scale ranging from 0 (never) to 4

(very often). Total scores on the PSS are obtained by reversing the scores on seven positive items and then summing across all 14 items. In this sample, total scores ranged from 2 to 53 (out of a possible 56), with a mean of 26.68 ( $SD = 9.43$ ). Similarly, Cohen et al. (1983) reported a mean of 25.6 ( $SD = 8.24$ ) in his female community sample.

The PSS has shown adequate internal and test-retest reliability ( $\alpha = 0.84$  and  $0.85$ , respectively; Cohen et al., 1983). Moreover, it provides stronger predictive validity of health outcomes compared to measures of objective stressors (Cohen et al., 1983). In this sample, the standardized Cronbach's alpha was also strong ( $\alpha = .89$ ).

### *Coping Strategies*

*Coping Inventory for Stressful Situations* (CISS; Endler & Parker, 1990c). The CISS is a 48-item self-report questionnaire that measures four different coping strategies: problem-focused (e.g., “analyze my problem before reacting” or “take corrective action immediately”); emotion-focused (e.g., “blame myself for not knowing what to do” or “tell myself it is not really happening to me”); social diversion (e.g., “phone a friend”); and avoidance coping (e.g., “buy myself something”). Participants are asked to use a 5-point scale ranging from 1 = *not at all* to 5 = *very much* to indicate how much they engage in a range of activities when they “encounter a difficult, stressful, or upsetting situation.” See Appendix L for a copy of the scale. To remain consistent with the literature on coping and health outcomes (e.g., Aldwin & Yancura, 2004), only problem-focused, emotion-focused, and avoidance coping were included in the current analyses.

Total scores for problem- and emotion-focused coping can range from 16 to 80, and avoidance coping scores range from 8 to 40. In our sample, scores ranged from 21 to 80 for problem-focused coping ( $M = 55.29$ ,  $SD = 10.65$ ), 17 to 78 for emotion-focused

coping ( $M = 55.19$ ,  $SD = 10.56$ ), and 8 to 37 for avoidance ( $M = 20.70$ ,  $SD = 5.58$ ).

Endler and Parker (1990c) have reported means of 58.6 ( $SD = 8.65$ ), 42.57 ( $SD = 11.35$ ), 20.49 ( $SD = 5.90$ ) for problem-focused, emotion-focused, and avoidance coping, respectively within a community sample of adult women. Internal reliability for the CISS subscales is generally good ( $\alpha = .82$  to  $.89$ ; Endler & Parker, 1990c). Our sample yielded Cronbach's alphas for the three main scales that ranged from  $.74$  to  $.90$ .

### *Physical Health Concerns*

*Health Symptom Checklist* (HSC; Runtz, 2002). The HSC was used in this study to assess for the presence and frequency of physical health symptoms. The HSC is an expanded and modified version of the 25-item Physical Symptoms Survey (PSS; Cuevas & Vaux, 1984). The HSC consists of 54 general health symptoms (e.g., nausea, fatigue, pelvic pain, weakness), which are rated on a Likert-type scale from 0 (not at all) to 5 (occurs daily). See Appendix M for sample items from this scale. Participants were instructed to indicate the occurrence of these symptoms over the past 6 months to identify both current and recent health symptoms. Total scores on the HSC can range from 0 to 270; the range for this sample was 3 to 249 ( $M = 46.58$ ,  $SD = 29.71$ ). Runtz (2002) previously reported a mean of 38.8 ( $SD = 21.4$ ) among female university students.

The HSC demonstrated high internal consistency ( $\alpha = .92$ ) in the present sample. Runtz (2002) reported a Cronbach's alpha of  $.89$ . The HSC also proved to have good construct validity through significant correlations ( $p < .001$ ) with health-related variables, such as disease conviction, the negative influence of health symptoms on social and occupational functioning, and visits to the doctor (Runtz, 2002).

*Medical service utilization.* In order to assess utilization of medical services in this sample, participants were asked to indicate the number of visits they had made to a variety of health care professionals and services in the past year. Options included their regular physician, medical specialists, walk-in clinics, and a hospital emergency ward. Number of visits were rated on a scale from 0 (no visits) to 6 (20 or more visits). Scores were summed across services to represent the total number of yearly medical visits. Total scores could range from 0 to 24, and the mean score in this sample was 6.15 ( $SD = 3.33$ ). This measure was previously used with a large sample of female university students, but assessed utilization in the past 6 months (vs. 12 months). The reported mean in that study was 3.4 ( $SD = 2.9$ ; Eadie, Runtz, & Spencer-Rogers, 2008).

*Functional impairment.* For the WHRS, Runtz developed a number of items that were based roughly on items from existing scales (e.g., the Oswestry Low Back pain Disability Questionnaire; Fairbank, Couper, Davies, & O'Brien, 1980; the Illness Behaviour Questionnaire; Pilowsky & Spence, 1976). The selected items measure how much one's physical health interferes with daily functioning (see Appendix N for sample items). Items were analyzed using principal axis factoring and a single-factor solution based on 7 items was found (63% of the variance was accounted for;  $\alpha = .90$ ). Items include "my work (or school) performance has suffered because of my health problems," "my health problems have interfered with my sex life," and "my symptoms interfere with my life." Participants were asked to rate how often they have experienced each item in the past 6 months on a 5-point scale from 1 (not at all) to 5 (a great deal). Total scores can range from 7 to 35. The mean score in our sample was 17.71 ( $SD = 7.87$ ).

## Results

The results section addresses the following six topics in order: (1) missing data procedures; (2) prevalence rates for childhood maltreatment in this sample; (3) relationships between demographic variables and other main variables; (4) intercorrelations and associations among the measures; (5) results for the tested structural equation models; and (6) analyses regarding the final research question, which explores the relative association of each form of maltreatment with each type of health concern. All statistical analyses were conducted using SPSS 17.0 except for the structural equation modeling (SEM), which was performed with AMOS 17.0 (Arbuckle, 2008).

### *I. Missing Data*

Data were examined using missing data analyses. All questionnaire and interview responses had less than 2% missing data, with the exception of the medical service utilization items (less than 10% missing data). Missing values for victimization items were replaced with zeros so as not overestimate maltreatment experiences (Anda et al., 1999). Other missing values were replaced with sample means for that item.

## *II. Prevalence Rates for Childhood Maltreatment*

*Child physical abuse (CPA)*. Participants were classified as having experienced CPA if they endorsed experiencing any of the 6 items on the Severe Physical Abuse subscale at least "rarely" (score of 1 or higher), or any of the other 10 items on the Physical Abuse Questionnaire (PAQ; Demaré, 1992) at least "sometimes" (score of 2 or higher). According to this definition, 51% of participants ( $n = 120$ ) experienced CPA. Furthermore, 80% of the sample ( $n = 187$ ) endorsed at least one item on the PAQ, while 20% of those reporting any CPA experienced severe physical abuse in childhood ( $n = 35$ ). See Appendix O for a list of item frequencies.

In terms of item endorsement, the most commonly reported behaviours that were experienced by a parent were being hit or slapped with an open hand (49% and 28%, for mothers and fathers, respectively) and being hit with an object such as a belt or cord (40% and 28%, for mothers and fathers, respectively). The most commonly endorsed items by other parental figures included having a body part twisted or yanked in a painful manner, being pushed or knocked down, having one's hair or ear pulled in a painful manner (12%,  $n = 29$  for each item), and being hit (16%,  $n = 37$ ). Each severe item was endorsed by at least 1% of the sample, with being choked and being harmed with a weapon as the most frequent items (5%,  $n = 12$  for each item).

*Child psychological maltreatment (CPM)*. Each participant in this sample endorsed at least one item on the Psychological Maltreatment Questionnaire (PMQ; Demaré, 1992). However, parental actions are generally considered psychologically abusive if they are quite pervasive in a child's life rather than occurring a single time (Glaser, 2002). When PMQ item frequencies were examined, 94% ( $n = 120$ ) of the

sample reported that they had experienced at least one behavior on the PMQ "sometimes;" 88% ( $n = 183$ ) indicated that at least one behavior occurred "often;" and 50% ( $n = 118$ ) indicated that at least one behavior occurred "very often." Participants most frequently reported that a parental figure tried to control or run their lives "often" (94%,  $n = 220$ ), screamed or yelled at them (92%,  $n = 216$ ), or acted emotionally "cold" towards them (86%,  $n = 203$ ). PMQ item frequencies are provided in Appendix P.

*Child sexual abuse (CSA).* Participants who reported any sexual contact when they were under the age of 18 with a person at least 5 years older than them or any sexual contact under the age of 18 that involved force or coercion used by a person of any age, were considered to have experienced CSA. Accordingly, 57% ( $n = 133$ ) of the sample met criteria for CSA. Participants' first CSA incident began at a median age of 8 years ( $M = 9.11$ ,  $SD = 4.36$ ) and lasted, on average, for 1 to 4 weeks. Acts of CSA were perpetrated more often by a non-family member (63%) and by individuals over the age of 18 (66%). Force or violence was used in approximately half of the reported sexually abusive experiences (46%,  $n = 61$ ) and 55% of cases involved coercion ( $n = 73$ ). Moreover, of participants reporting CSA, 47% ( $n = 63$ ) of them stated that vaginal or anal penetration had been involved. Finally, approximately 53% of women with CSA histories ( $n = 70$ ) reported only one CSA experience, while 23% ( $n = 31$ ) reported two incidents, around 17% ( $n = 22$ ) reported three, and almost 8% ( $n = 10$ ) reported four or five sexually abusive experiences before age 18.

*Cumulative childhood victimization experiences.* When child physical and sexual abuse were defined using the criteria described above, a total of 36.6% of participants ( $n = 86$ ) had experienced both of these victimization experiences. Using the conservative

criteria for child psychological maltreatment (only incidents that occurred at least "very often"), 36.2% of respondents ( $n = 85$ ) had experienced child physical *and* psychological maltreatment. Moreover, 35.3% of the sample ( $n = 83$ ) reported histories of both child sexual *and* psychological abuse. Finally, a total of 28.1% of participants ( $n = 66$ ) had experienced all three forms of childhood maltreatment.

### III. Demographic Information

Associations between each demographic variable and all victimization, psychological, and health variables were analyzed. Due to low frequencies on several demographic categories, all categorical demographic variables were dichotomized for the following analyses. All significant associations are discussed below.

*Age.* Age was positively correlated with total scores on the Psychological Maltreatment Questionnaire (PMQ;  $r = .24, p < .001$ ), indicating that older participants were more likely to have experienced these maltreatment experiences as children. Similarly, participants with histories of child sexual abuse were significantly older than those without,  $t(233) = -2.47, p < .05$  ( $M = 38.63, SD = 10.47$  vs.  $M = 35.11, SD = 11.32$ , respectively). Age was not associated with scores on the Physical Abuse Questionnaire or any of the other main variables of interest (including the health variables).

*Marital status.* Avoidance coping was the only variable that was significantly related to marital status,  $t(233) = 2.22, p < .05$ . Specifically, single, divorced, or widowed women used more avoidance coping than women who were married or cohabitating ( $M = 21.27, SD = 5.49$  vs.  $M = 19.56, SD = 5.61$ , respectively).

*Sexual orientation.* Sexual orientation was only significantly related to one physical health measure. Women who identified as lesbian or bisexual had higher scores on functional impairment than heterosexual women,  $t(233) = -2.94, p < .01$  ( $M = 21.6, SD = 7.05$  vs.  $M = 17.14, SD = 7.84$ , respectively).

*Racial affiliation.* Racial identity was significantly associated with a number of coping styles. Specifically, Caucasian participants reported engaging in more problem-focused coping compared to non-Caucasians,  $t(232) = 2.06, p < .05$  ( $M = 56.17, SD =$

10.57 vs.  $M = 50.83$ ,  $SD = 10.4$ , respectively). Caucasian participants also had significantly lower scores on distraction coping [ $t(232) = -3.77$ ,  $p < .001$ ,  $M = 20.30$ ,  $SD = 5.43$  vs.  $M = 25.33$ ,  $SD = 5.58$ ].

*Education level.* Participants' highest level of education was significantly related to scores on the Health Symptom Checklist,  $t(230) = 2.4$ ,  $p < .05$ . Specifically, women with no high school diploma reported greater physical symptoms compared to women who had at least graduated from high school ( $M = 63.63$ ,  $SD = 24.14$  vs.  $M = 45.32$ ,  $SD = 29.74$ , respectively). Moreover, participants who had not graduated from high school had higher scores on the PMQ,  $t(233) = 2.59$ ,  $p < .05$  ( $M = 87.75$ ,  $SD = 25.75$  vs.  $M = 69.86$ ,  $SD = 26.75$ , respectively).

*Income.* Current annual household income was significantly related to a number of variables of interest. Women earning less than \$20 000 per year had higher scores on the PMQ compared to women earning \$20 000 or more,  $t(199) = 4.89$ ,  $p < .001$  ( $M = 82.19$ ,  $SD = 27.62$  vs.  $M = 64.34$ ,  $SD = 24.11$ , respectively). Similarly, women with histories of child sexual abuse were more likely to earn less than \$20 000 per year,  $X^2 = 9.04$ ,  $p < .01$ . Annual income was also related to perceived stress,  $t(199) = 2.01$ ,  $p < .05$ ; participants earning less than \$20 000 each year reported significantly higher levels of perceived stress ( $M = 28.55$ ,  $SD = 8.82$  vs.  $M = 25.88$ ,  $SD = 9.82$ ). These women were also significantly more likely to report more physical health symptoms [ $t(197) = 2.65$ ,  $p < .001$  ( $M = 53.3$ ,  $SD = 34.34$  vs.  $M = 42.04$ ,  $SD = 25.56$ ], and more emotion-focused coping [ $t(199) = 2.39$ ,  $p < .05$  ( $M = 47.62$ ,  $SD = 10.66$  vs.  $M = 43.72$ ,  $SD = 12.15$ )] compared to women earning \$20 000 or above each year.

#### *IV. Relations Among Measures*

All intercorrelations among variables are presented in Table 3. Only significant associations are discussed below.

*Childhood maltreatment variables.* Relationships among the measures of childhood maltreatment were analyzed using Pearson correlations for continuous variables and independent samples *t*-tests for the dichotomous CSA measure. Analyses revealed that all measures were significantly associated with each other. Recall that higher scores on the Psychological Maltreatment Questionnaire (PMQ) and Physical Abuse Questionnaire (PAQ) represent more severe maltreatment experiences. Total scores on the PMQ were positively correlated with total scores on the PAQ, as well as with higher scores on the severe subscale on the PAQ. Moreover, individuals with histories of CSA had significantly higher scores on the PMQ, PAQ, and on the severe subscale of the PAQ.

*Psychological variables.* Psychological variables in this study included perceived stress, avoidance coping, emotion-focused coping, and problem-focused coping. Higher scores on each of these measures denotes greater stress, or in respect to the coping variables, greater use of that coping strategy. In the present sample, perceived stress was positively associated with emotion-focused and avoidance coping and negatively related to problem-focused coping. Moreover, emotion-focused coping was negatively related to problem-focused coping and positively associated with avoidance coping (see Table 3).

Table 3

*Pearson Correlations Between Continuous Abuse, Psychological, and Health Variables*

Variable	1	2	3	4	5	6	7	8	9	10
1. CSA	-									
2. CPM	.33**	-								
3. CPA	.25**	.67**	-							
4. Stress	.12	.19**	.13	-						
5. Avoidance	-.07	.06	.05	.25**	-					
6. Emo-Foc	.12	.18**	.13*	.54**	.38**	-				
7. Prob-Foc	-.02	-.26	.07	-.35**	-.58	-.31**	-			
8. Phys Symp	.13	.27**	.31**	.40**	.29**	.46**	-.05	-		
9. Med Util	.07	.15*	.15*	.20**	.15*	.22**	-.02	.44**	-	
10. Func Imp	.07	.15*	.05	.37**	.18**	.46**	-.16*	.46**	.43**	-

\* $p < .05$ ; \*\* $p < .01$ .

*Physical health variables.* Health variables included in this study's analyses included scores on the Health Symptom Checklist (HSC) and functional impairment scale and degree of medical service utilization. Higher scores on the first two measures indicate poorer physical health and higher scores on the latter refers to greater use of medical services. All health variables were significantly, positively related to each other as evidenced by Pearson correlations.

*Childhood maltreatment and psychological variables.* *T*-tests revealed that a history of CSA was not significantly associated with either perceived stress or coping variables. There was a significant positive correlation between perceived stress and scores on the PMQ. Emotion-focused coping was also positively related to scores on the PMQ, PAQ, and to the severe subscale of the PAQ. Finally, problem-focused coping was positively correlated with scores for the severe physical abuse subscale.

*Childhood maltreatment and physical health variables.* Scores on the PMQ were significantly correlated with each of the physical health measures. Moreover, scores on the PAQ and the severe PAQ subscale were associated with scores on the HSC and medical service utilization. CSA was not significantly correlated with any of the health outcomes.

*Psychological and health variables.* Perceived stress was positively correlated with all of the physical health measures, as were avoidance coping and emotion-focused coping. Problem-focused coping was only significantly related to functional impairment.

### *V. Model Testing*

Structural equation model testing was conducted to evaluate the proposed structural models (Figures 1 to 4; see Introduction). Structural models are evaluated based on the fit of the model to the data. A number of indices are used to assess model fit. Firstly, the *chi-square goodness-of-fit* index measures the discrepancy between covariances produced by the data and covariances implied by the hypothesized model. A nonsignificant chi-square is desirable as this indicates no difference in fit between the observed data and the specified model (Hoyle & Panter, 1995). A high *p* value is not unlikely with large sample sizes, which is why other indices of model fit should be employed. The *relative chi-square* reflects how well a model fits per degree of freedom (ratio of the chi-square value to the model's degrees of freedom); ratios of less than 3 indicate excellent model fit (Byrne, 2001).

The *comparative fit index* (CFI) compares the hypothesized model to a model that assumes all variables are independent of each other (covariances set to zero). The CFI can range from 0 to 1, and values of .95 or higher indicate exceptional model fit (Hu & Bentler, 1995). The *goodness of fit index* (GFI) estimates the proportion of variance or covariance in the data accounted for by a model. Values of .90 reflect reasonable fitting models, while values of .95 or higher suggest outstanding models (Byrne, 2001). Finally, the *root mean square error of approximation* (RMSEA) estimates the lack of model fit to a non-restricted (saturated) model where the number of parameter estimates is equal to the number of data points. Lower values (.05 to .08) are optimal, with values of .10 reflecting poor model fit (Byrne, 2001).

Chi-square difference tests ( $\chi^2$ DIF) were used to compare the fit of alternative models. Nonsignificant  $\chi^2$ DIF tests indicate that the fits of nested models are comparable. Maximum likelihood (ML) estimation was used to estimate parameters because of its popularity in the literature and durability under less than optimal conditions (i.e., non-normal distributions; Hoyle, 1995).

*Confirmatory factor analysis.* The measurement model consisted of two latent variables, childhood maltreatment (CM) and physical health concerns. CM included three indicators (physical abuse, sexual abuse, and psychological maltreatment), as did physical health concerns (health symptoms, functional impairment, and medical service utilization). Two regression coefficients (one per latent factor) were fixed to a value of one in order to scale the latent constructs (child psychological maltreatment and physical symptoms). All indicators loaded significantly onto their latent factors. The measurement model fit the data well,  $\chi^2(8) = 17.08, p = .03, \chi^2/df = 2.14, GFI = .98, CFI = .97, RMSEA = .07; CI = .02-.12$ .

#### *Model 1: Mediation with Perceived Stress*

The first structural model to be tested investigated the mediating effects of perceived stress in the relationship between the predictor (CM) and outcome (physical health concerns). The hypothesized model consists of childhood maltreatment (CM) as the predictor variable, physical health problems as the outcome variable, and perceived stress as the mediator. As demonstrated in Figure 1 (see page 32), the full model (Model 1) includes a direct pathway from CM to health problems (Path *a*), as well as an indirect pathway via perceived stress (Paths *b* and *c*). The full model thus consists of two nested models: Model 1A (Path *a*) represents the direct relationship between predictor and

outcome; Model 1B (Paths *b* and *c*) represents the mediated model (Path *a* is set to 0). It is noteworthy that in SEM, variables that are represented as rectangles are measured variables, while circles reflect latent, or unmeasured, variables. Moreover, the 'e' symbol represents the error variance for each measured variable, and a 'd' symbol denotes the disturbance associated with a latent variable. All pathways are labelled with standardized coefficients; significant relationships are accompanied by asterisks (\*).

*Hypothesis 1.* It was expected that women with histories of CM would report greater physical health symptoms, functional impairment, and medical service utilization compared to women without childhood victimization experiences. The direct-effects model (Model 1A) was identical to the measurement model, fitting the data very well (see Figure 5). CM was significantly related to physical health concerns,  $\beta = .35, p < .01$ , indicating that subsequent mediation could be tested. Moreover, all other pathways were significant, demonstrating that CM was significantly associated with each indicator of physical health problems.

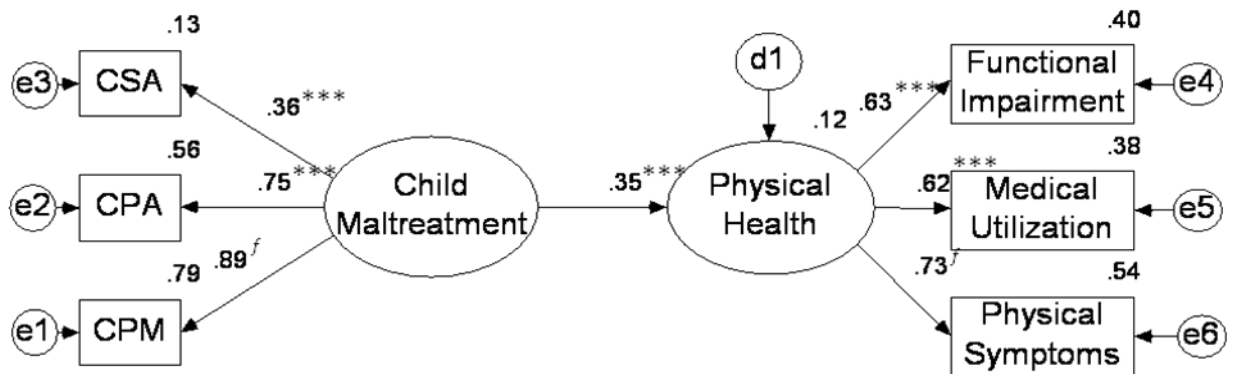


Figure 5. Model 1A: Assessment of the direct impact of childhood maltreatment on physical health outcomes.

<sup>f</sup> fixed path loadings; \*\*\* $p < .001$ .

*Hypothesis 2.* Perceived stress was expected to mediate the link between CM and physical health concerns. According to Baron and Kenny's (1986) procedures, several

analyses need to be run in order to demonstrate mediation. First, the direct path between predictor and outcome needs to be significant. Second, the predictor must be significantly associated with the mediator, and the mediator must predict the outcome. Moreover, the pathway between predictor and outcome must be attenuated when the mediator is included in the model. Recent revisions to Baron and Kenny's methods stipulate that the indirect pathway between predictor and outcome must also be reliable; the Sobel test is a commonly used and highly recommended procedure to evaluate the significance of this effect (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002).

The perceived stress-mediated model (Model 1) resulted in very good model fit,  $\chi^2(12) = 25.19, p = .01, \chi^2/df = 2.10, GFI = .97, CFI = .96, RMSEA = .07; CI = .03-.12$ . Path coefficients indicated that CM was significantly related to perceived stress, which in turn was significantly associated with physical health concerns. The Sobel test indicated a reliable indirect path between CM and physical health concerns through perceived stress ( $p < .05$ ). Mediation was evidenced by the good fit of Model 1 and a significant indirect pathway (see Figure 6).

Given that annual household income was significantly correlated with almost every variable of interest, the mediation model was re-run three times examining income as a covariate for each main construct. Income was not significantly associated with perceived stress ( $\beta = -.08, p > .05$ ) or the latent physical health factor ( $\beta = -.06, p > .05$ ). Moreover, model fit remained good, and all pathways remained significant, when income was included in the model. Therefore, after controlling for income, perceived stress remained a significant mediator in the link between CM and physical health.

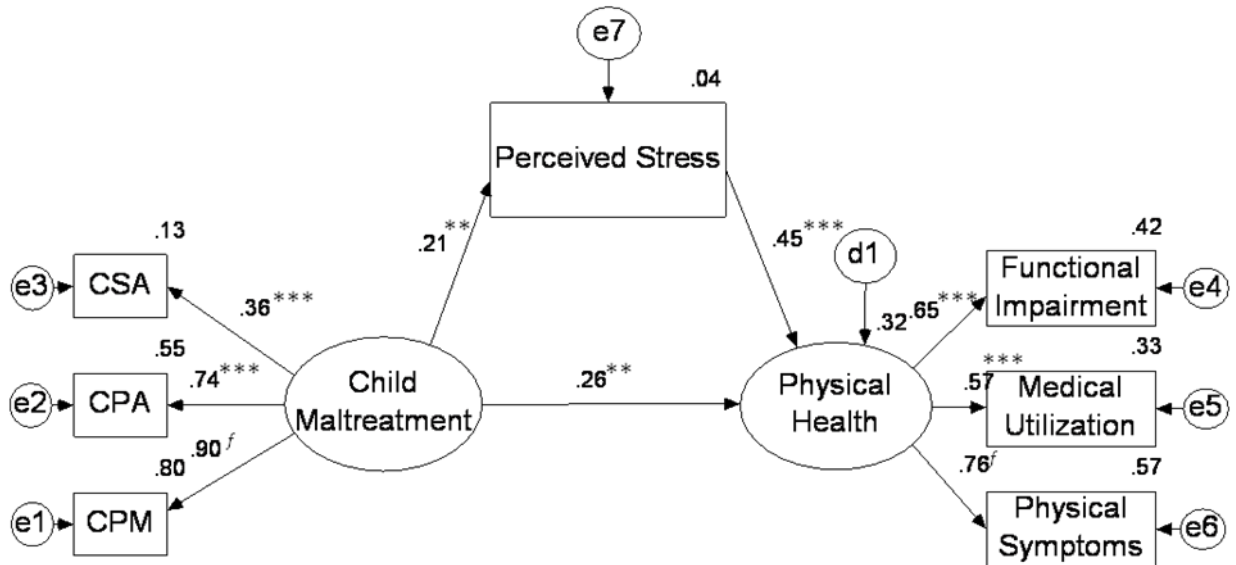


Figure 6. Model 1: Perceived stress as a mediator between child maltreatment and physical health problems.

<sup>f</sup> fixed path loadings; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

In SEM, full mediation is demonstrated when the direct pathway from CM to physical health adds no significant improvement to model fit when the mediators are in the model. To test for full mediation, Model 1B (Path *a* is constrained to 0) was compared to the overall model (Model 1). Full mediation is identified when Model 1 yields good model fit; the indirect path (*b* and *c*) is nonzero and significant; the direct path (*a*) is zero and nonsignificant; and there is no difference in model fit (nonsignificant  $\chi^2_{DIF}$ ) between Model 1 and Model 1B (i.e., constrained model). Alternatively, partial mediation is demonstrated when all aforementioned criteria are met except that path *a* remains significant in Model 1.

To test for full mediation, Model 1 was compared to Model 1B in which path *a* was set to zero. The chi-square difference test was reliable,  $\chi^2_{DIF}(1) = 10.53, p < .01$ , indicating that the constrained (fully-mediated) model provided a poorer fit to the data,  $\chi^2(13) = 35.72, p = .001, \chi^2/df = 2.75, GFI = .96, CFI = .94, RMSEA = .09; CI = .05-.12,$

than the partially-mediated model (see Model 1). Moreover, the direct path in the free-to-vary model (Model 1) remained significant with the mediator in the model, also invalidating full mediation. Thus, perceived stress *partially* mediates the pathway between child maltreatment and physical health concerns, with 32% of the variance being accounted for in physical health problems. The extent of partial mediation in a model is found by multiplying the unstandardized path coefficients for the two components of the mediated pathway (Paths *b* and *c*) in the free-to-vary model and then dividing this value by the  $\beta$  for the direct path (Path *a*). In this case, the indirect path through perceived stress accounted for 27% of the total effect of CM on physical health concerns.

*Model 2: Mediation with Coping Strategies*

*Hypothesis 3.* Coping strategies were also expected to mediate the relationship between child maltreatment and physical health status. Model 2A, which investigated the mediating influence of problem-focused coping, fit the data very well,  $\chi^2(235) = 24.27, p = .02, \chi^2/df = 2.02, GFI = .97, CFI = .96, RMSEA = .07; CI = .03-.10$  (see Figure 7).

However, path coefficients revealed non-significant associations between CM and problem-focused coping ( $\beta = .00, p > .05$ ), as well as between coping and physical health ( $\beta = -.11, p > .05$ ). These findings suggest that problem-focused coping does not serve as a mediator in the relationship between CM and health.

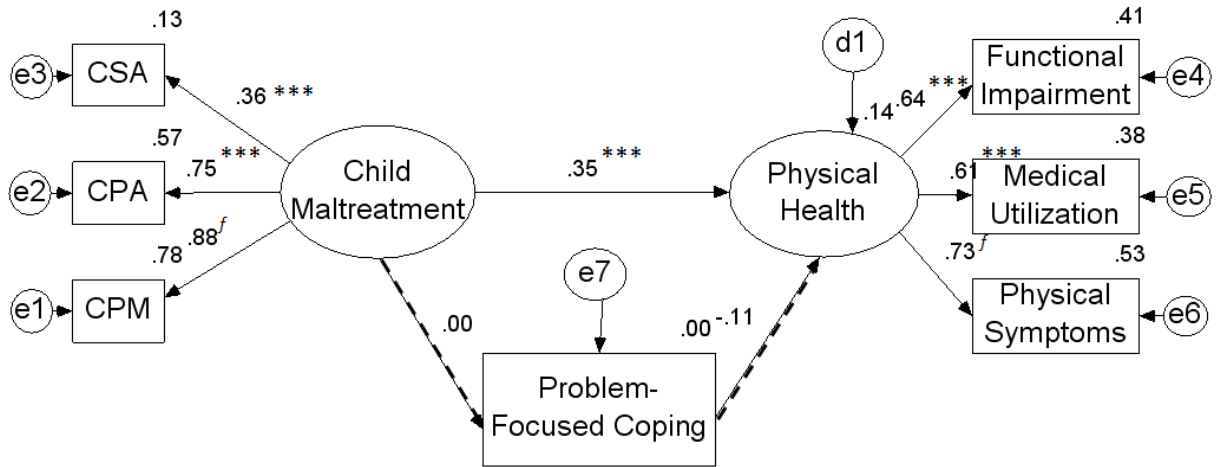


Figure 7. Model 2A: Problem-focused coping as a mediator between child maltreatment and physical health problems. Nonsignificant paths are denoted by dotted lines. <sup>f</sup> fixed path loadings; \*\*\* $p < .001$ .

Next, emotion-focused coping was examined as a mediator in the association between CM and physical health concerns. This model (Model 2B) also fit the data well,  $\chi^2(235) = 30.46, p < .01, \chi^2/df = 2.54, GFI = .97, CFI = .95, RMSEA = .08; CI = .05-.12$ . All individual pathways were significant including the indirect path (Sobel test  $p < .01$ ), suggesting mediation (see Figure 8). Thus, emotion-focused coping was further examined as a full mediator in this relationship. Overall model fit for a constrained model (direct pathway between CM and physical health constrained to 0), however, was significantly worse than the free-to-vary model,  $\chi^2DIF = 9.73, p < .01$ . Therefore, emotion-focused coping partially mediates the association between CM and health, with emotion-focused coping accounting for 32% of the total effect between CM and physical health. Overall, the partially mediated model accounted for 41% of the variance in physical health concerns, with greater emotion-focused coping predicting increased physical health concerns among survivors of child maltreatment.

As a final step, income was again examined as a covariate in the model, all pathways and loadings remained significant after controlling for annual household income.

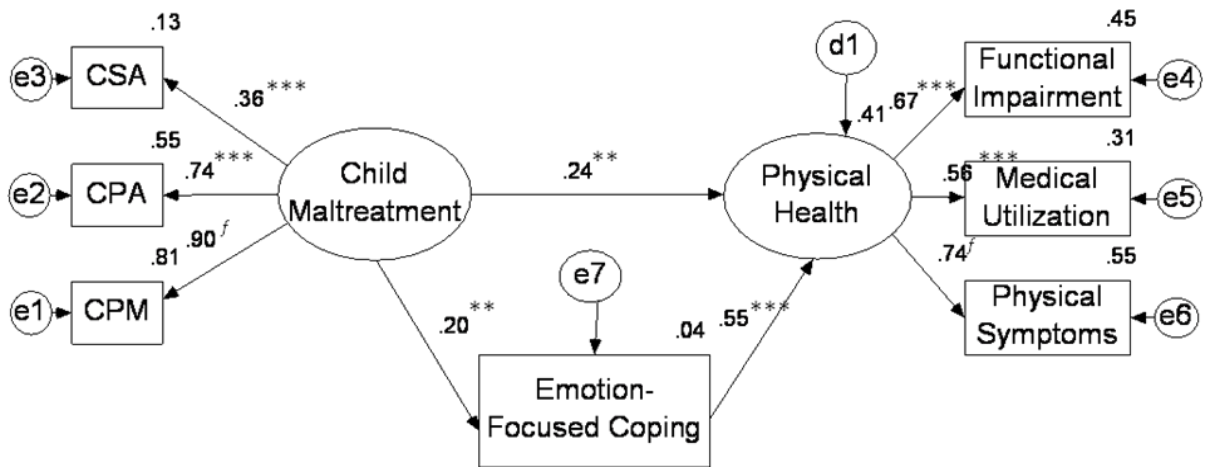


Figure 8. Model 2B: Emotion-focused coping as a mediator between child maltreatment and physical health problems.  
<sup>f</sup> fixed path loadings; \*\* $p < .01$ ; \*\*\* $p < .001$ .

Finally, avoidance coping was examined as a mediating factor in the CM-health relationship. The overall model fit the data well,  $\chi^2(16) = 22.38, p = .03, \chi^2/df = 1.87, GFI = .97, CFI = .97, RMSEA = .06; CI = .02-.99$  (see Figure 9). However, examination of path coefficients revealed that the association between CM and avoidance coping was non-significant,  $\beta = .03, p > .05$ . Accordingly, avoidance coping does not serve as a mediator in the relationship between CM and physical health concerns within this sample.

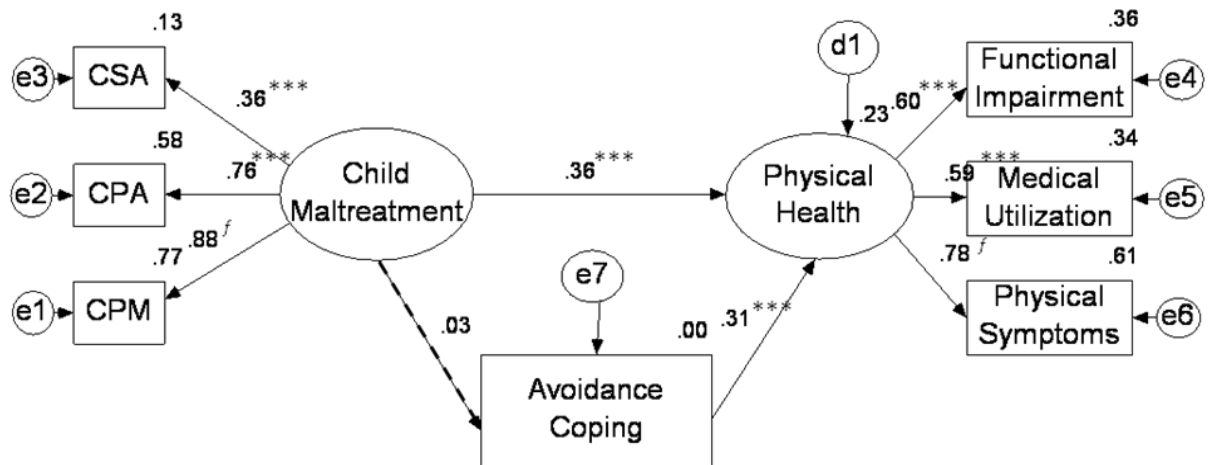


Figure 9. Model 2C: Avoidance coping as a mediator between child maltreatment and physical health problems. Nonsignificant paths are denoted by dotted lines.  
<sup>f</sup> fixed path loadings; \*\*\* $p < .001$ .

*Model 3: Moderated Mediation*

Next, the moderating influence of each coping strategy (problem-focused, emotion-focused, and avoidance) on the perceived stress-mediated model (Model 1) was investigated. Tests of moderated mediation examine whether mediation relationships are stronger or weaker depending on the level of a third variable (e.g., high or low levels of a particular coping strategy; James & Brett, 1984; Preacher, Rucker, & Hayes, 2007). Of interest in this study was whether women’s health would be influenced by the use of more or less of a coping strategy (as defined by a median split) when exposed to stress.

As a first step, measurement equivalence between coping groups should be established to provide a baseline model of comparison (Byrne, 2004). This can be accomplished by conducting confirmatory factor analyses of the overall model with each group. Subsequently, specific factor loadings should be examined for invariance between groups. This consists of comparing a model in which the factor loadings are constrained to be equal across the two groups to a model in which the factor loadings are allowed to

be freely estimated across groups. A non-significant  $\chi^2$  difference between the constrained and unconstrained models would suggest no between-group differences (Byrne, 2004). In accordance with the first criteria for measurement equivalence, the measurement model fit the data adequately for both groups (high and low) on each coping strategy. Moreover, all path loadings were reliable in each model.

Next, factor loadings were examined for invariance. In the case of problem-focused coping, all parameters were found to be invariant across groups,  $\chi^2\text{DIF} = 3.45, p > .05$ . Similar measurement invariance was found for avoidance coping,  $\chi^2\text{DIF} = 9.01, p > .05$ . Thus, these parameters were constrained in subsequent analyses to yield more parsimonious models. For emotion-focused coping, child physical maltreatment loaded differently onto the CM latent factor for the two groups ( $\beta = .79, p < .001$  for high and  $\beta = .24, p < .001$  for low problem-focused copers). This yielded a significant difference in overall model fit,  $\chi^2\text{DIF} = 13.41, p < .01$ . Kenny (2008), however, has advised that the  $\chi^2$  difference criteria for invariance may be too stringent when dealing with small samples. He suggests that a good fitting measurement model for each group could suffice. Based on at least adequate evidence for measurement invariance, subsequent testing of path invariance was permissible.

Multiple group analyses were conducted in which the paths from (1) CM to perceived stress, (2) perceived stress to physical health concerns, and (3) CM to physical health were compared across groups. Specifically, a model in which these paths were constrained to be equal was compared to a model in which they were allowed to be freely estimated across groups. A significant  $\chi^2$  difference test statistic would indicate that paths differ between groups, and thus vary as a function of the coping moderator.

When considering problem-focused coping as the moderator, there were no significant differences in the overall model fit between women who used more problem-focused coping and those who used less,  $\chi^2_{DIF}(7) = 5.91, p > .05$ . Although the overall model fit did not vary between coping groups, the pathways between CM and perceived stress, as well as to physical health concerns, were only significant for high problem-focused copers,  $\beta = .34, p < .01$  (compared to  $\beta = .10, p > .05$ ) and  $\beta = .34, p < .01$  (vs.  $\beta = .16, p > .05$ ), respectively. These findings suggest that child maltreatment survivors who use more problem-focused coping have greater perceived stress and physical health concerns compared to those who use less problem-focused coping.

When high emotion-focused copers were compared to low emotion-focused copers, similar results were found,  $\chi^2_{DIF}(3) = 5.71, p > .05$ . When specific path coefficients were examined, however, it was revealed that the pathway between child maltreatment and physical health concerns was only significant in the context of high emotion-focused coping,  $\beta = .40, p < .001$  (compared to  $\beta = .24, p > .05$  for low emotion-focused coping). Thus, in the presence of high, but not low, emotion-focused coping, child maltreatment predicts greater physical health concerns.

When considering avoidance coping, however, there was a significant difference between groups in the mediation model,  $\chi^2_{DIF}(7) = 23.45, p = .001$  (see Figure 10). Examination of the path coefficients revealed that the path from child maltreatment to physical health outcomes was moderated by avoidance coping, such that CM predicted poorer physical health when avoidance coping is high,  $\beta = .56, p < .001$ , and not when avoidance coping was low,  $\beta = .17, p > .05$ . Moreover, child maltreatment was significantly related to perceived stress only when avoidance coping was low,  $\beta = .35, p$

< .001 (compared to  $\beta = .02, p > .05$  for high avoidance). A non-significant pathway between CM and perceived stress suggests that perceived stress does not operate as a mediator in the pathway between CM and physical health in the context of high avoidance coping. Instead, it appears that high avoidance coping exacerbates the direct effects of CM on physical health status. However, at low levels of avoidance coping, CM is only related to physical health concerns indirectly through perceived stress.

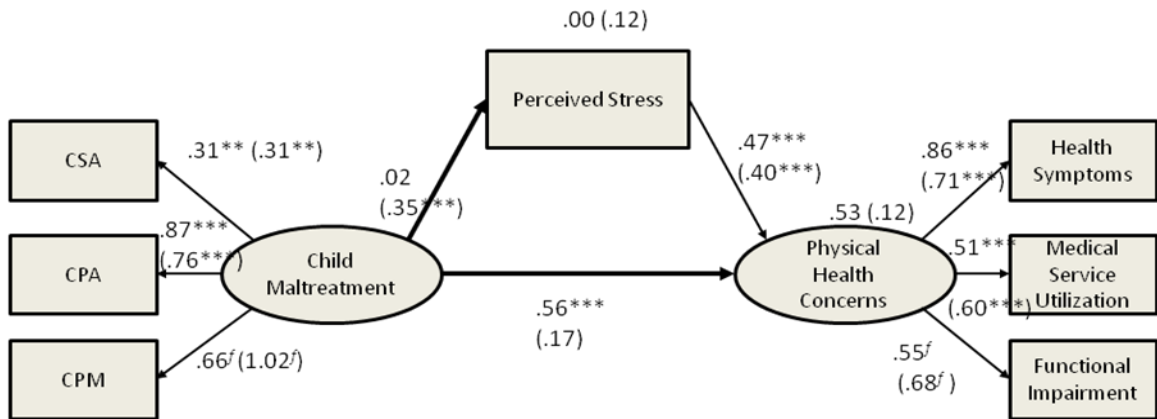


Figure 10. Multi-group structural equation model examining avoidance coping as a moderator of the effects of child maltreatment and perceived stress on physical health concerns and of maltreatment on stress.

Note. Error variances are omitted from the figure. Moderated paths are denoted in bold. Path coefficients for high avoidance copers are presented first, with the path coefficients for low avoidance copers presented in parentheses. Model fit for multi-group SEM:  $\chi^2(24) = 39.83, p < .05, \chi^2/df = 1.66, GFI = .95, CFI = .96, RMSEA = .05; CI = .02-.82$ . <sup>f</sup>fixed path loadings;  $**p < .01, ***p < .001$ .

Model 4: Multi-Mediation with Coping and Perceived Stress

Given that neither problem-focused coping nor avoidance coping was found to mediate the relationship between child maltreatment and physical health, multi-mediation through stress and coping was investigated only with emotion-focused coping.

The overall model for emotion-focused coping fit the data very well,  $\chi^2(16) = 32.68, p < .01, \chi^2/df = 2.04, GFI = .97, CFI = .97, RMSEA = .07; CI = .03-.10$ . Upon closer examination, all path coefficients were significant except for the direct path

between child maltreatment and perceived stress,  $\beta = .10, p > .05$ . Recall that this pathway was significant when coping was not included in the model (see Model 1). This suggests that emotion-focused coping might fully account (i.e., mediate) for the relationship between CM and perceived stress, thus attenuating the direct path between CM and perceived stress. To test this hypothesis, nested model 4A was run, whereby the direct path between CM and perceived stress was constrained to be zero. There was no significant difference in model fit between Model 4 and Model 4A ( $\chi^2 = 2.79, p > .05$ ). Moreover, the indirect pathway between CM and perceived stress through emotion-focused coping was reliable according to the Sobel test ( $p < .001$ ). Therefore, the relationship between child maltreatment and perceived stress was fully mediated by emotion-focused coping (see Figure 11). Overall, these findings imply that CM is significantly related to greater physical health concerns through emotion-focused coping, as well as indirectly through emotion-focused coping and then greater perceived stress.

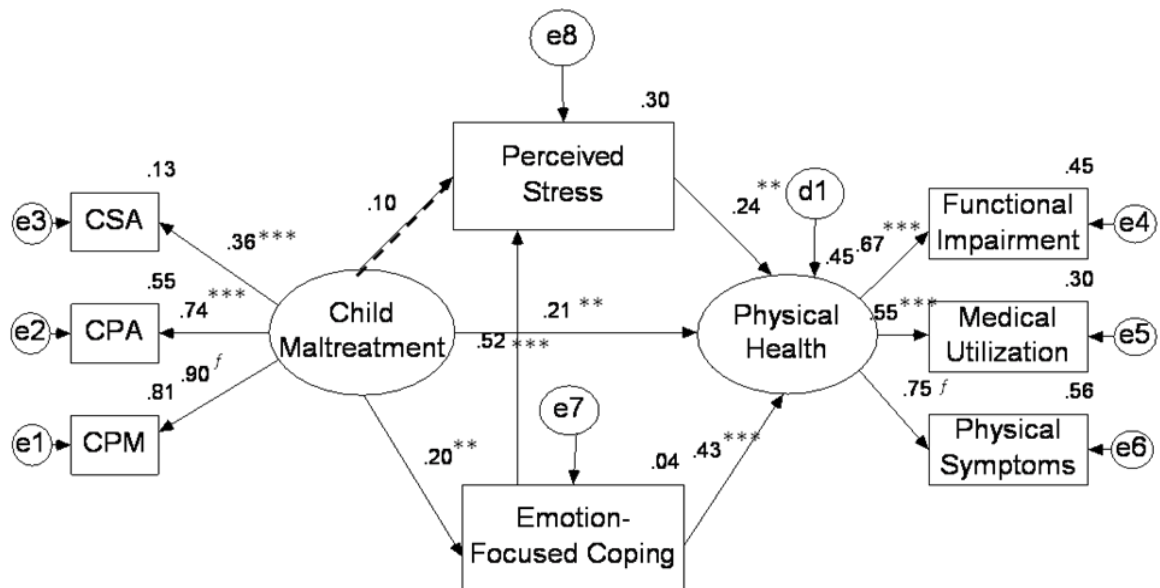


Figure 11. Model 4: Emotion-focused coping and stress as mediators of the relationship between CM and physical health. The nonsignificant path is denoted with a dotted line. <sup>f</sup>fixed path loadings; \*\* $p < .01$ , \*\*\* $p < .001$ .

Several nested models were compared to ensure that Model 4 was the best fitting model for the data. To test for full mediation of the CM-physical health relationship, the free-to-vary model was compared to a model that constrained Path *a* (direct path between CM and health) to zero. The overall model fit for the constrained model was good [ $\chi^2(18) = 43.58, p < .01, \chi^2/df = 2.42, GFI = .96, CFI = .95, RMSEA = .08; CI = .05-.11$ ], but significantly worse than the free-to-vary model,  $\chi^2DIF(1) = 8.024, p < .01$ , suggesting partial mediation by emotion-focused coping and perceived stress. In total, the mediated model accounted for 45% of the variance in physical health concerns.

Next, the overall model (Model 4) was compared to Model 1, which has perceived stress as a single mediator of the CM-health association (paths to and from coping were constrained to 0). Model 4 fit the data significantly better than Model 1,  $\chi^2DIF(3) = 112.58, p < .001$ . Finally, Model 4 was compared to Model 2B, which forces all of the indirect effects through emotion-focused coping (the indirect path through perceived stress was constrained to 0). Model 2B was significantly worse than the multi-mediation model,  $\chi^2DIF(3) = 93.66, p < .001$ . Moreover, indirect pathways through emotion-focused coping and perceived stress accounted for 39% of the total effects of CM on physical health. Taken together, these findings suggest that the pathway between CM and physical health is better accounted for by emotion-focused coping *and* perceived stress, than by either perceived stress or emotion-focused coping alone.

*VI. Final Research Question*

This study also aimed to clarify whether each form of child maltreatment (sexual, physical, and psychological) is differentially related to physical health outcomes (general health symptoms, medical service utilization, and functional impairment). This final research question was examined using simultaneous multiple regression in SPSS. A significant  $R^2$  indicates a reliable prediction of a given dependent variable (DV) by a set of independent variables (IVs). Following a significant overall  $R^2$ , the unique associations between each IV and the DV, independent of the other IVs, can be examined (e.g., partial regression coefficients). Results from the multiple regression analyses are presented in Table 4. Physical health symptoms were the only DV significantly predicted by the set of maltreatment types. However, only child physical abuse made a unique, significant contribution, relative to the other forms of maltreatment, ( $\beta = .237, p < .01$ ). Though the cluster of IVs was not significantly predictive of functional impairment, child psychological maltreatment had a unique, significant association with this outcome ( $\beta = .205, p < .05$ ).

Table 4

*Summary of Simultaneous Regression Analysis for Prediction of Physical Health Variables by Maltreatment Types*

Variable	F	df	R <sup>2</sup>	β
<b>General Health Symptoms</b>				
Overall model	9.08***	3	.11	
CPA				.24**
CPM				.10
CSA				.03
<b>Functional Impairment</b>				
Overall model	2.25	3	.03	
CPA				-.09
CPM				.21*
CSA				.03
<b>Medical Service Utilization</b>				
Overall model	2.17	3	.03	
CPA				.08
CPM				.10
CSA				.01

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\*  $p < .001$ .

## Discussion

The purpose of this study was to explore associations between childhood maltreatment (CM), perceived stress, coping strategies, and physical health outcomes. As expected, child maltreatment predicted significantly greater physical health concerns among adult women. Moreover, perceived stress and emotion-focused coping operated as independent and interrelated mediators in this association. Furthermore, problem-focused, emotion-focused, and avoidance coping were all found to moderate the effects of CM on subsequent functioning. A final aim of this project was to evaluate whether each form of child maltreatment (sexual, physical, and psychological) uniquely impacts physical health outcomes (physical symptoms, functional impairment, and medical service utilization). Only some of these relationships were found to be significant.

### *Child Maltreatment and Physical Health*

As hypothesized, a direct relationship was found between child maltreatment and adverse physical health in adulthood. Specifically, when considered together, women who had histories of sexual, physical, or psychological maltreatment in childhood are more likely to report more physical health symptoms, greater functional impairment, and increased use of medical services. That is, women with histories of CM are more likely to experience bodily symptoms (e.g., headaches, pain, muscle weakness), to report that their health negatively impacts their daily functioning, as well as to visit medical professionals more frequently. These findings enhance the growing body of literature that associates child maltreatment with poorer self-reported health status (e.g., Runtz, 2002; Springer et al., 2007). Felitti and colleagues (1998), for example, found that increased exposure to maltreatment in childhood was associated with several of the leading causes of death

among adults, including substance abuse, sexually transmitted illnesses, heart disease, and cancer. Child abuse has also been consistently linked with poorer physical health-related quality of life in adulthood (e.g., Afifi et al., 2007; Lang et al., 2006), as well as increased visits to health professionals among women (e.g., Arnow, Hart, Hayward, Dea, & Taylor, 2000; Walker, Gelfand, et al., 1994).

Child maltreatment research typically examines the impact of child sexual abuse without controlling for other forms of CM, or fails to discriminate between abuse types. In particular, very little attention has been paid to the long-term negative health consequences of psychological maltreatment in childhood. The current study addressed this gap in the literature by examining the impact of multiple forms of CM (using a latent CM variable in SEM) and by also investigating the unique influence of each form of CM relative to the others (through the use of multiple regression). It was found that the three maltreatment types jointly predicted greater physical health symptoms. Moreover, child physical abuse appeared to have a unique relationship with health symptoms, and child psychological maltreatment was associated with greater functional impairment over and above the other abuse types. Child sexual abuse was not uniquely associated or significantly correlated (at the bivariate level) with any of the health outcomes.

Results are consistent with other studies that have found each form of maltreatment to be associated with somewhat different health outcomes. Lang and colleagues (2006), for example, found that child physical abuse predicted poorer general health, while emotional abuse was associated with increased bodily pain, functional impairment, and greater likelihood of using pain medication. Similarly, Rodgers et al., (2004) reported that each form of CM was associated with its own cluster of health-risk

behaviors among women. Akin to this study's results, a number of studies have found that after controlling for other forms of CM, sexual abuse no longer predicts general physical health status (e.g., Afifi et al., 2007; Arnow et al., 2000; Runtz, 2002). One explanation for this finding is that sexual abuse might be more strongly related to physical health outcomes not tested here. Physical problems may be more likely to manifest in areas of the body that are implicated in the act of sexual victimization. Some studies, for example, have found that sexual abuse is especially related to reproductive and sexual health problems, as well as gastrointestinal and pelvic pain symptoms (Drossman et al., 1990; Eadie et al., 2008; Runtz, 2002). Alternatively, physical and psychological maltreatment tend to be more strongly associated with general physical health status, as was seen in this study.

The dichotomous nature of the sexual abuse variable used in most studies, including the present investigation, may also influence these findings. Although continuous variables are optimal for structural equation modeling (Thompson, 2000), severity of sexual abuse is a particularly difficult experience to quantify as it does not necessarily correspond to frequency or duration. In the absence of this variability, we could not uncover the extent of the physical health consequences that might be associated with child sexual abuse experiences alone.

Non-significant regression results are also not surprising given the strong associations among the maltreatment variables used in the present study (e.g.,  $r = .67$  for physical and psychological abuse). Multiple regression analyses examine the unique contribution of a given variable over and above other predictors. Therefore, highly correlated variables may appear to be less important predictors than is the case. In

actuality, forms of child maltreatment are likely to co-occur (Dong et al., 2003), which is why statistical techniques that assess their shared impact (e.g., SEM) yield more meaningful findings. Accordingly, we can conclude that in combination, child sexual, physical, and psychological maltreatment are associated with poor physical health status among adult women. However, it appears that child sexual abuse does not as strongly predict physical health problems compared to physical or psychological maltreatment. Future studies need to incorporate psychological and physical maltreatment into their models to help elucidate the negative impact of these commonly ignored variables.

Several explanations for this association have been provided, including persistent injuries or illnesses incurred at the time of abuse, depression, and posttraumatic stress symptoms (see Resnick et al., 1997 and Schnurr & Green, 2004 for reviews). Less attention has been given to the role of sub-clinical levels of distress or coping in the link between maltreatment and physical health.

#### *Perceived Stress as a Mediator between Child Maltreatment and Health*

Consistent with one of this study's main hypotheses, perceived stress was found to partially mediate the relationship between CM and physical health status. This means that perceived stress accounted for some, but not all, of the direct association between CM and physical health. Though perceived stress has previously been found to mediate the link between CM and adverse mental health (e.g., Schumm et al., 2005), no other study has investigated this mechanism with physical health outcomes. These findings are consistent, however, with a large body of literature implicating perceived stress as a predictor of poorer self-reported physical health (Cohen et al., 2007; Weekes et al., 2005) and greater health care utilization (e.g., Dobkin et al., 2003).

There is a considerable amount of research linking child maltreatment with the development of posttraumatic stress symptoms and subsequent physical health problems (e.g., Schnurr & Green, 2004). Alternatively, very little attention has been given to how CM might lead to non-traumatic, everyday stress and greater reactivity to these stressors. Schumm et al. (2005), for example, found that low-income women with histories of child sexual abuse were more likely to experience increased subjective stress, as defined by the loss of key resources. A few studies that utilized the Perceived Stress Scale (Cohen et al., 1983) also found CM to be associated with greater current and recent self-reported stress (Bell & Belicki, 1998; Embree & Runtz, 1996; Hyman et al., 2007). Conversely, Thakkar and McCanne (2000) did not find differences in self-reported daily hassles between women with and without histories of child sexual abuse. Our finding that CM significantly predicted greater perceived stress augments the existing literature and suggests that histories of CM are associated with perceptions of heightened everyday stress among women. We note, however, that CPM was the only form of maltreatment that was significantly associated with perceived stress at the bivariate level. This finding is consistent with emerging evidence that psychological maltreatment may have the most damaging and long-lasting effects on abuse survivors (O'Hagen, 1993).

While previous research has demonstrated the significance of certain stress-related variables in the pathway between CM and physical health problems (i.e., PTSD, subjective stress, dysregulated stress hormones), no study has found that these factors fully account for this relationship (Lang et al., 2006; Lawler et al., 2005). Therefore, it is not surprising that perceived stress did not fully mediate the link between CM and health status in the present study. A number of explanations for why perceived stress might at

least partially explain the relationship between CM and poor physical health have been posited (e.g., neurobiological dysregulation, hyper-vigilance, health-risk behavioural coping). The majority of these mechanisms were not explicitly tested in this study, but are still useful for our understanding of these associations. Coping strategies, however, are considered an integral component in models of stress and health and were evaluated in this study to help clarify the mechanisms linking CM, perceived stress, and physical health status. Following a discussion of perceived stress and its relationship with CM and health, the impact of coping on the other variables of interest will be explored.

Neurobiological research suggests that early and persistent adverse life experiences, such as CM, can permanently alter the central stress response system, rendering individuals more reactive to subsequent psychosocial stressors (Friedman & McEwen, 2004; McEwin, 1998). In addition, CM survivors are at greater risk of developing negative cognitions that might enhance their distress throughout life. Pine (2003), for example, posits that CM survivors tend to develop hostile attentional biases, whereby they are more likely to interpret social situations as threatening. Similarly, Briere (2002) suggests that children who are repeatedly beaten, screamed at, sexually abused, or abandoned come to associate elements of the abuse with fear and distress. These conditioned responses can develop into “generalized fear structures,” which lead the individual to become stressed when exposed to similar stimuli in the future (e.g., any male, an authority figure, etc.).

Several researchers also purport that child maltreatment can diminish one’s social and psychological resources, which can lead to more stressful experiences throughout life. For example, in the absence of positive modeling or validation, the social skills and

self-confidence of abused children might not develop adequately (Hobfoll, 1998; Monroe & Simons, 1991). Briere (2002) discusses how an abused child may come to view others as “inherently dangerous, rejecting, or unavailable.” This core relational schema is likely to interfere with this individual’s ability to form and maintain relationships throughout life, hindering her sense of trust, safety, and control. These women are likely to experience greater stress because they lack supportive social networks and are continually involved in chaotic and conflictual relationships. Finally, the overwhelming and intolerable pain of abusive experiences can motivate the use of maladaptive coping strategies such as distancing, distraction, or self-blame, which may alleviate tension temporarily. These defences, however, preclude any problem solving and might aggravate stress in the long-run (Spaccarelli, 1994).

Heightened perceived stress among abuse survivors might lead to physical health concerns for several reasons. The most widely cited explanation pertains to the interrelationship among perceived stress, dysregulated neuroendocrine systems, and immune functioning. The perception of stress, particularly among biologically vulnerable individuals, can interfere with physiological systems responsible for regulating immune processes (Friedman & McEwen, 2004, Roelofs & Spinhoven, 2007). In other words, child maltreatment might sensitize women to experience greater stress in later life; when stressed, these women can become more susceptible to colds, flu, pain, and infection, and are more likely to view themselves as less healthy and seek out medical help.

In addition, stress can influence how individuals attend to their bodies and associated physical symptoms. Perceived stress can increase awareness to bodily sensations that are evoked by stress, such as rapid heartbeat, unsteady breathing, and

excessive sweating. Abuse survivors might be more likely to misattribute the significance of these symptoms (Cohen & Williamson, 1991). This can, in turn, enhance reporting of physical symptoms or consultations with medical professionals (Kirmayer et al., 2004; Mayer et al., 2001). A number of researchers have suggested that attentional mechanisms might be particularly relevant for survivors of violent abuse. Perceived stress can activate intense somatosensory representations associated with a traumatic event, which can be experienced as physical symptoms (Brown, 2004; Nijenhuis et al., 1998).

Psychodynamic theorists offer an alternative perspective on stress and health. Early traumatic experiences can continue to be distressing long after they have ended. As a means of suppressing some of this distress, negative affect might manifest somatically and be experienced and reported in terms of physical symptoms (Janet, 1907; Walker et al., 1992). According to this *conversion hypothesis*, somatizing abuse survivors should report heightened physical concerns, but not increased perceived stress. A somatization explanation for this study's findings is unlikely given that women in this sample were more likely to report greater perceived stress, as well as physical health problems.

Behavioural responses to stress are also considered an important mechanism through which perceived stress impacts physical health. For example, maladaptive coping responses to stress, such as smoking, drinking, illicit drug use, or sedentary behaviours, may exacerbate the risk of physical health problems (Cohen et al., 1997; Lazarus & Folkman, 1984). Similarly, women who rely on avoidant tendencies might be less likely to adhere to medical regimens or seek appropriate medical attention, thus worsening their physical health status (Aldwin & Yancura, 2004). Future research should examine and

compare some of these explanatory mechanisms (i.e., stress hormones, self-reported stress, attentional biases, and coping) to provide more clarity to this mediation pathway.

*Coping as a Mediator in the Link between Maltreatment and Health*

This study's hypotheses pertaining to coping strategies were only partially supported. Contrary to expectations, the use of problem-focused and avoidance coping to deal with current life stress were not found to mediate the link between CM and physical health concerns. Specifically, no direct relationships were found between CM and either of these two coping strategies. Conversely, emotion-focused coping served as a partial mediator in the association between CM and health status; a history of child maltreatment was associated with increased emotion-focused coping, which was in turn predictive of poorer physical health. An indirect pathway between CM and health status through emotion-focused coping is consistent with findings from previous studies. For example, using a multivariate regression model, Romans et al. (2002) found that the impact of child maltreatment on physical health symptoms in a community sample of adult women was considerably reduced as a result of the use of emotion-focused coping. Similarly, negative forms of emotional coping (e.g., expressing anger or dissatisfaction with god) have been found to partially mediate the association between CM and psychological adjustment (Gall, 2006; Runtz & Schallow, 1997). It is noteworthy that some studies document the health *benefits* of emotion-focused coping. Pennebaker (2000), for example, has demonstrated that writing and talking about one's feelings about a traumatic event can have positive effects on physical health. It appears that the expression and acceptance of emotions may impact health status differently than being preoccupied with

one's negative emotions. Future studies must be careful to distinguish between the various types of emotion-focused coping.

Not unlike our own findings, other researchers have failed to find associations between child maltreatment, avoidance and problem-focused coping, and physical health status. For example, some research suggests that CM might not interfere with one's problem-focused coping strategies, but rather enhances the likelihood of using emotion-focused coping strategies with current stressors (Lietenberg et al., 2004). Moreover, Aldwin and Yancura (2004) posit that associations between trauma and coping strategies are largely dependent on the nature of the stressor a person is facing. For instance, some studies report that survivors of CM are more likely to utilize avoidance coping when dealing with their abuse histories, but not when managing other life stressors (Coffey et al., 1996; Futa et al., 2003; Lawler et al., 2005). Moreover, the effects of unmanageable stressors (e.g., chronic illness) can actually be exacerbated by problem-focused coping when a more passive, restful approach is due (Newth & DeLongis, 2004; Penley et al., 2002). We did, however, find a significant association between avoidance coping and increased physical health problems, which is highly consistent with the literature (e.g., Aldwin & Park, 2004). This emphasizes the need to consider avoidance coping as a risk factor for adverse health outcomes, irrespective of how it develops.

Explanations for associations between child maltreatment, emotion-focused coping, and health status are well-documented in the literature. Given their helplessness at the time of the abuse, child abuse survivors often have little recourse but to turn inwards, trying to manage their own distress, as opposed to their uncontrollable situation. Consequently, they may try to blame themselves for provoking their attacker or become

preoccupied with trying to regulate and dissipate their emotions. They may also try to alleviate some of the stigma and shame associated with their situation by blaming or getting angry at themselves (Coffey et al., 1996; Runtz & Schallow, 1997). These coping strategies can become habitual responses to stress that are applied to stressors throughout life, particularly in situations that provoke similar feelings of shame and helplessness (Gibson & Lietenberg, 2001; Widom, 2000). A second possibility is that child maltreatment increases the risk of psychological problems, such as depression and anxiety, which in turn lead to greater reliance on emotion-focused coping (e.g., blaming oneself, becoming tense, angry, or upset when stressed; Lietenberg et al., 2004). Alternatively, the resource depletion hypothesis posits that persistent stress can deplete one's effective coping abilities, allowing for more maladaptive coping strategies to dominate (Baumeister, Faber, & Wallace, 1999; Hobfoll et al., 1996). However, the lack of an association between CM and decreased problem-focused coping in this study fail to support this explanation. Finally, abusive parents tend to model ineffective methods for managing their emotions, stress, and frustration. Abused children might consequently learn to use inappropriate, more emotion-based coping techniques (e.g., becoming upset or angry) when faced with their own stressors (Hitchcock, 1987).

Aldwin and Yancura (2004) discuss a number of reasons why emotion-focused coping might negatively influence physical health status. One explanation is that emotion-focused coping directly impedes physical health. Preoccupation with one's emotions can interfere with self-care or treatment adherence, thus leading to poorer health outcomes. Although women in our study who relied on emotion-focused coping were more likely to visit health care professionals, it is unclear whether they heed the

advice of their doctors. Treatment compliance is an understudied topic among trauma survivors and should receive more attention in future studies. An alternative explanation is that emotion-focused coping strategies might lead to increased psychological symptoms like depression and anxiety. The biological alterations associated with mood disorders might serve as an indirect pathway through which coping influences physical health. Negative affect can also impede self-care, deplete one's energy, restfulness, and appetite, and enhance feelings of unwellness in general. Finally, researchers who subscribe to transactional models of stress and coping (e.g., Lazarus & Folkman, 1984; Spaccarelli, 1994) suggest that ineffective coping strategies can enhance one's stress levels, which can in turn exacerbate physical health problems. For example, abused children who are unable to manage the emotional turmoil associated with abuse experiences will be less capable of regulating their emotions and dealing with stress in the future (Briere, 2002). The indirect pathway between coping and health through perceived stress is discussed below.

#### *Coping as a Moderator of Maltreatment and Stress*

This study explored the moderating effects of various coping strategies on the associations between child maltreatment, perceived stress, and physical health. Specifically, we examined whether using more or less of a particular coping strategy would differentially impact how CM and stress influence physical health. Though specific hypotheses were not made, we expected that among abuse survivors or those experiencing greater stress, decreased use of problem-focused coping and greater emotion-focused and avoidance coping would be associated with poorer health status. Moderation models were partially supported in the current study. It was found that child

maltreatment was only related to greater perceived stress and physical health problems in the context of high problem-focused, emotion-focused, or avoidance coping (as compared to low levels of each coping strategy). Moderation analyses also revealed that child maltreatment predicted greater perceived stress for high, but not low, problem-focused copers, and for low, but not high avoidance copers.

Results pertaining to problem-focused coping may seem unexpected in light of previous findings that implicate problem-focused coping as a healthy response to stress. However, problem-focused coping can actually exacerbate the effects of stress on mental and physical health in the short-term (e.g., Aldwin, 1994), which is more consistent with our findings. Newth and DeLongis (2004), for example, report that the use of problem-focused coping was the only coping strategy associated with greater physical symptoms. Researchers suggest that problem-focused coping in the context of uncontrollable stressors may overexert the body; adaptive responses to stress consist of taking action where appropriate, as well as learning to rest. In addition, problem-focused coping strategies may only be associated with better outcomes *after* the problem has been resolved. In the interim, seeking support or advice or tackling a problem head-on, can be stress-inducing. There is also evidence in the literature that highly distressed individuals are more likely to grasp at several coping strategies, or to alternate between extremes of high overexertion and excessive avoidance (Burt & Katz, 1988; Newth & DeLongis, 2004). These strenuous patterns may instead be accounting for the greater stress and physical symptoms experienced by maltreatment survivors in the current study. This investigation's findings support this claim as CM predicted physical health problems in the context of high levels of all three coping strategies. Some research also suggests that

problem-focused coping is only beneficial to one's health if the individual perceives the approach to be working (e.g., Barrera, 1986). Abuse survivors who utilize a lot of problem-focused coping may attend therapy, seek social support from friends, or spend a great deal of time analyzing their problems and developing possible solutions. However, these problem-focused coping techniques will only minimize harm if they are actually successful in reducing stress.

We found that CM was associated with greater physical health problems in the context of high, but not low, emotion-focused coping. This finding is consistent with prior studies documenting emotion-focused coping as a moderator of the link between victimization and a range of negative health outcomes (e.g., Haden et al., 2008). The literature is now extended to include physical health problems. Given that this investigation found significant associations between emotion-focused coping and CM as well as physical health, it is not surprising that emotion-focused coping also emerged as a moderator of this association. These findings suggest that CM is more likely to be associated with physical health problems among individuals who rely more heavily on emotion-focused coping strategies. In addition, mediation results revealed that emotion-focused coping helps explain *why* CM impacts physical health. Therefore, it appears that emotion-focused coping operates as both a mediator and moderator in the association between CM and health. Temporally speaking, emotion-focused coping might better be conceptualized as a mediator, instead of a moderator, of the CM-health relationship. Though causality cannot be proven with cross-sectional data, it is reasonable to suspect that maltreatment experiences in childhood precede efforts to process and cope with current and recent stressful events (Holmbeck, 1997). Moreover, a model that contained a

direct path between CM and emotion-focused coping fit the current data better than one that examined coping as a moderator. This might be explained by the significant association between CM and emotion-focused coping. Accordingly, emotion-focused coping (as measured in this study) appears to be a particularly risky coping strategy for CM survivors. Future theoretical and empirical work should address whether coping strategies operate as mediators or moderators in the context of trauma and health.

Similar to our own findings, a number of studies have documented the harmful impact that avoidance has on health when coping with life stress (e.g., Day & Livingstone, 2001; Straight, Harper, & Arias, 2003). In this sample, abused women with high avoidance coping reported greater physical health concerns compared to women with low avoidance coping. This relationship is not surprising given the health-compromising nature of several avoidant coping strategies, such as binge eating, substance use, and minimizing the seriousness of an imminent threat. A number of theorists presume that avoidance coping, contrary to problem-focused coping, exacerbates distress and enhances the likelihood of using health-risk behaviours or developing stress-mediated physical health problems (e.g., Cohen et al., 1997). This study, however, did not find current perceived stress to account for the relationship between CM and health status for high avoidance copers. One possible explanation is that other forms of emotional distress are mediating this association, such as trauma-specific stress, depression, or anxiety. An alternative explanation is that high avoidant copers deny their stress and rather express their distress somatically. This hypothesis is more likely given our finding that only low avoidant copers reported greater perceived stress among abuse survivors.

This study did not find any of the coping strategies to moderate the effects of current perceived stress on physical health. Despite strong theoretical rationale for the moderating role of coping on subjective stress (e.g., Holmbeck, 1997; Lazarus & Folkman, 1984), evidence for these claims has been quite inconsistent. Newth and Delongis (2004), for example, found that cognitive, but not behavioural, forms of problem-focused coping moderated the effects of current life stress on health. Day & Livingstone (2001) reported that only two forms of coping (venting of emotions, disengagement) interacted with recent stress to impact health. Moreover, Wadsworth and Compas (2002) found no evidence for moderation when examining relationships between recent stressful events, coping, and adjustment. As coping research evolves, it is becoming clearer that the moderating effects of coping are generally small and frequently do not exist for every type of coping and stressor. Although each coping strategy investigated here was found to moderate the impact of child maltreatment on health, associations among perceived stress and health did not vary between levels of coping. One possible explanation for this finding is that the pathway between perceived stress and physical health is more neurobiologically- or attentionally-based, as opposed to being influenced by behavioural responses (see pages 80-81 for a discussion of these mechanisms). Alternatively, the interactive effects of current stress and coping may not have been strong enough to influence physical health status at the time of measurement. There is a growing body of literature showing how stress and maladaptive coping take time to deteriorate health, as opposed to having immediate consequences (Friedman & McEwen, 2004). More longitudinal studies can help illuminate how patterns of stress and coping influence physical health over time.

*Coping and Stress as Mediators in the Link between Maltreatment and Health*

Researchers have long asserted that ineffective coping strategies can lead to greater stress, which can in turn influence physical health problems (e.g., Cohen et al., 1997; Lazarus & Folkman, 1984). Accordingly, this study evaluated a model that tested an indirect pathway between CM and physical health through coping strategies and perceived stress. Emotion-focused coping was the only coping strategy evaluated in this multi-mediational model because of its unique, significant associations with CM and physical health. It was found that child maltreatment led to increased emotion-focused coping, which in turn predicted greater perceived stress, and subsequently predicted increased physical health concerns. In combination, emotion-focused coping and perceived stress partially mediated the direct link between CM and physical health. Moreover, coping and stress accounted for more of the direct relationship between CM and health than either variable on its own.

To our knowledge, no other study has tested the interrelationship among these four variables. However, the findings are consistent with existing research that examines various components of this multivariate model. Among abuse survivors, emotion-focused coping has previously been found to mediate the effects of CM on psychological distress. Outcomes have included depression (Simoni & Ng, 2000), emotional difficulties (Thabet, Tischler, & Vostanis, 2004), and most commonly, posttraumatic stress symptoms (e.g., Bal et al., 2003). Interestingly, these associations are more common among women compared to men who have experienced abuse as children (e.g., Sigmon, Greene, Rohan, & Nichols, 1996). The present study augments this literature by illustrating that emotion-

focused coping also puts female abuse survivors at risk of greater levels of subclinical distress in their daily lives.

Researchers have been unable to corroborate the precise mechanism by which coping and stress work together to impact physical health. A number of studies have demonstrated the stress-reducing effects of problem-focused coping (e.g., Lequerica et al., 2008), which in turn seems to improve physical health (Hall et al., 2006; Haritatos et al., 2007). Emotion-focused coping has been found to have opposite effects on stress levels (Kohn, Hay, & Legere, 1994; Lequerica et al., 2008). One study in particular reported that alternative stress management approaches (e.g., relaxation and focused tai chi training) led to decreased use of emotion-focused coping strategies, which in turn, contributed to less stress-mediated physical health problems among individuals with HIV (McCain et al., 2008). Therefore, a link between emotion-focused coping and health through perceived stress as found in the current study is consistent with previous studies.

Interrelationships among stress, coping, and health are still highly ambiguous in the literature. We have identified emotion-focused coping as both a consequence of early stressful life experiences (e.g., child maltreatment) and an antecedent to greater perceived stress. Perhaps the most fitting explanation for our findings stems from transactional models of stress and coping. Transactional theories purport that individuals are continually interacting with their environments (Sameroff & Fiese, 1990); extremely adverse situations, for example, make it particularly difficult to cope effectively, and ineffective coping can in turn enhance the stressfulness of a given situation (Lazarus & Folkman, 1984). Spaccarelli (1994) endorses a transactional model of stress and coping that pertains specifically to cases of child abuse. He discusses how several aspects of an

abuse experience can enhance its stressfulness, making it more difficult for a child to cope adaptively. More frequent acts of abuse, for example, can instill greater helplessness in a child, while coercion can generate feelings of self-blame or forced acceptance.

Emotion-focused or avoidant coping strategies might therefore develop to alleviate some of the immediate suffering. Moreover, abuse can interfere with one's ability to trust or create attachments with others, thus depriving these individuals of key coping resources.

Spaccarelli posits that avoidant coping strategies adopted in the context of child abuse can in turn lead to increased distress. He states that denial or avoidance of the reality of abuse can have severe mental health consequences. Emotion-focused coping strategies (e.g., self-blame, becoming overwhelmed by one's emotions) can also be considered harmful in that they may interfere with healing processes like meaning-making, relationship-building, and regaining a sense of control. Without emotionally recovering from an abuse experience, survivors are at risk of enduring distress in several domains throughout their lives. Although Spaccarelli refers to trauma-specific stress and coping that arises in the aftermath of child abuse, findings from the present study are an important augmentation to his work. Namely, child maltreatment seems to lead to greater emotion-focused coping in relation to non-traumatic stressors, and this maladaptive form of coping fully explains the presence of greater perceived stress in adulthood. In turn, greater perceived stress predicts increased physical symptoms, impairment in several life domains (e.g., occupational, social), and utilization of health services.

#### *Limitations of the Current Study*

Findings from this study should be interpreted in light of a number of limitations. Firstly, this project is based on a sample of adult women who are primarily of lower-

middle socioeconomic backgrounds. These women also reported rates of child maltreatment that were higher than is commonly found in the general population (e.g., Scher et al., 2004). Moreover, a large proportion of the sample discovered advertisements for this study when seeking health care. Consequently, results from this investigation may not be generalizable to the general population of adult women. Lower socioeconomic status is in itself a confounding factor of physical health problems. It is notable, however, that results remained significant after accounting for annual household income. The women sampled here may still represent a particularly vulnerable portion of the population who are in greater need of health care. Self-selection bias may also be interfering with this study, in that women more likely to discuss victimization experiences or to seek medical attention are also more likely to participate in a study assessing stressful life events and health status. Nevertheless, women with abuse histories reported greater stress and physical health problems compared to non-abused women in this sample. This highlights a need to validate and attend to these women's concerns.

Likewise, by focusing exclusively on women, the findings cannot generalize to male survivors of child maltreatment. There is a growing body of literature demonstrating that child maltreatment impacts men and women differently (Briere, Elliott, Harris, & Cotman, 1995). Moreover, women are more likely to self-report feeling stressed, and subjective stress appears to be more predictive of physical health concerns in women than in men (Haritatos et al., 2007; Nguyen-Rodriguez, Unger, & Spruijt-Metz, 2009). Consequently, pathways tested here were designed based on an understanding of women's experiences. Future research should investigate the mediating and moderating influences of the association between CM and physical health among male survivors.

A second limitation to this study concerns the cross-sectional nature of its data. Without a longitudinal design, claims cannot be made about the causal relationships among the variables. Physical health problems are themselves stressful experiences and may lead to increased perceived stress and greater use of avoidant and emotion-focused coping strategies. Moreover, without controlling for preexisting health conditions, we cannot be certain that child maltreatment precedes poor health status. Even so, the direction and ordering of the variables tested were guided by previous theory and cross-sectional, as well longitudinal, research (e.g., Stein & Rotheram-Borus, 2004).

All measures used in this study were retrospective and self-report. Self-reports are inherently susceptible to distortions in recall, as well as to mood or social desirability. Recall of maltreatment experiences that occurred several years before can suffer from inaccuracy. Moreover, discussing one's trauma history might trigger negative emotions, which can inflate reporting of trauma severity, as well as stress and physical symptoms. Despite these problems, self-reports are informative tools for understanding how individuals experience and handle their suffering. We know that *perceptions* of traumatic experiences, and not simply a trauma history, are important determinants of recovery and pathology (Schnurr & Green, 2004). Similarly, individuals' perceptions of stress and physical problems will determine how they deal with them (e.g., use of medical or psychological services, self-medication, lifestyle changes, unhealthy coping strategies), whether they actually suffer from greater ailments or not. Intervention and treatment programs can greatly benefit from understanding how subjectively experienced stress contributes to physical health problems in the aftermath of child maltreatment, as well as how CM survivors experience their own physical well-being.

Another limitation to this project is that other variables not accounted for in the analyses may serve as confounds. For instance, other forms of trauma, such as adult sexual or physical assault, were not controlled in this examination of the data. However, a sizeable proportion of the population experiences multiple traumatic experiences in their lifetime (Kessler et al., 1995), making it difficult to account for all traumas in a single research study. Moreover, this study did not control for the presence of psychological symptoms. It is possible that psychological conditions such as PTSD or depression are accounting for the perceived stress experienced by maltreatment survivors in this study and influencing their physical health concerns. Notably, Cromer and Sachs-Ericsson (2006) found that associations between CM, daily life stress, and physical health problems remained after controlling for the presence of PTSD. Furthermore, the Perceived Stress Scale has been found to have different predictive validity than measures of depression (Cohen et al., 1983). This highlights the important role of non-clinical levels of distress in health status, a mechanism that may be relevant to more of the general population. Future research should investigate the separate contributions of perceived stress, negative affect, and clinical stress symptoms on the physical health of abuse survivors. Finally, other psychological variables, such as personality traits, may influence how one responds to a maltreatment experience and subsequent stressors. More elaborate multivariate models could consider personality as a moderator of the impact of CM on health across the lifespan.

Final limitations to this study are measurement issues. Firstly, subjective life stress was used as the sole indicator of stress in this investigation. Though a significant association was found between maltreatment and perceived stress, the effect size was

small, with CM accounting for only 4% of the variance in perceived stress. Other researchers have similarly found that CM results in small effect sizes (e.g., Rind, Tromovitch, Bauserman, 1998). However, a latent construct comprised of several stress indicators (e.g., cortisol levels, daily hassles, chronic stress) may have been more reliable.

As previously discussed, the coping literature in general is characterized by a number of limitations, some of which are relevant to the present study. There is accumulating evidence that suggests that coping strategies are context-specific and not as stable as previously assumed (Carver & Scheier, 1994). Moreover, individuals may be inclined to try several different coping strategies to handle one stressful situation. Research is now starting to examine the impact of different coping profiles (e.g., high avoidant-low problem-focused vs. low avoidant-low emotion-focused), which will more clearly illuminate the impact of coping on health outcomes. Due to sample size constraints, cluster analyses based on coping types were not possible in the current study.

Despite these limitations, the current study has several strengths. The sample adequately represented the local community and was sufficiently large to run multivariate analyses. Moreover, maltreatment was assessed with rigorous and comprehensive interviews, which allowed us to reliably assess the impact of several forms of abuse in combination and in isolation. This study provides a broad assessment of the distress and physical health ailments that concern victimized women. Understanding how women experience their own health in the aftermath of abuse can greatly inform clinical practice.

#### *Clinical Implications*

The current study has several implications for the health profession at large. This project indicates that female survivors of childhood maltreatment are particularly likely

to report higher levels of perceived stress and a range of physical health problems in adulthood. Moreover, women who experience subjective stress in their daily lives are at greater risk of suffering from physical ailments in the aftermath of childhood abuse. Accordingly, mental health professionals working with childhood maltreatment survivors should be aware that physical health complications, in addition to psychological symptoms, may be associated with interpersonal trauma. In addition, primary care and emergency room physicians must be knowledgeable about how some physical ailments might be psychologically-mediated or trauma-related. Medical professionals should be trained to identify and treat patterns of symptoms that are associated with abuse. For example, CM survivors tend to experience multiple unexplained medical symptoms and chronic pain, which may require a multi-modal as opposed to single-modal treatment approach (e.g., pain management, physiotherapy, strength-building, and biofeedback). Medical treatment alone is not always the best approach in treating these women, and medical doctors must be comfortable collaborating with or referring patients on to mental health professionals.

The literature indicates that abused women are more likely to seek treatment from physicians as opposed to mental health professionals (Schnurr & Green, 2004). Therefore, screening for histories of stressful life events (e.g., child abuse and other forms of interpersonal violence) should be an integral component of patient history-taking (Briere & Zaidi, 1989). Medical professionals may find themselves as the first point of contact for women disclosing or discussing abuse. Adopting an empathic and compassionate bed-side manner in these cases is essential so as to not re-traumatize or stigmatize women with a history of victimization. We have identified perceived stress as

an important avenue through which physical health problems might develop following child maltreatment. Physicians who cannot find organic causes to a patient's problems, or worse, attribute symptoms to being "all in a patient's head," could exacerbate the stress of their patients. Searching for caring and empathic medical assistance, these women may expend their resources going from one medical professional to the next, which could compound their stress levels. Overall, medical professionals have the responsibility to properly assess for victimization histories, identify physical health concerns that may be associated with abuse, refer on where necessary, and mitigate the stress of their patients. In addition, psychologists, psychiatrists, and counselors are encouraged to refer their clients to appropriate medical services for concurrent assessment and treatment. Findings from the current study elucidate that certain physical health ailments are psychologically and socially contextualized. Multi-disciplinary treatment approaches would have great utility for victimized individuals. Collaboration between medical and mental health professionals is a next-step in higher quality care.

The present study also has implications for health care professionals who work directly with abused children. Most treatments for survivors of traumatic events involve processing and effectively coping with the stress of one's trauma history. We have found that subjective everyday stress and the ways individuals cope with this stress can negatively impact their health in the aftermath of early victimization experiences. This suggests that abuse survivors are in need of more effective coping skills for dealing with stressors occurring within general life domains (e.g., social, occupational/academic), in addition to the stress directly linked with their trauma history. Adopting healthy coping strategies at an early age will likely minimize subsequent stress and physical health

problems for these individuals. Particular attention needs to be given to minimizing negative forms of emotion-focused coping strategies that are adopted by abuse survivors (e.g., rumination, self-blame). Social workers and foster care workers should emphasize stress-management, as well as healthy forms of emotion-focused coping (i.e., emotional expression), and discourage avoidance coping (i.e., disengagement, substance use, over-eating) as early as possible. Of critical importance, is the environmental support a child receives in the aftermath of abuse. Positive role modeling, perceived social support, and constructive extra-curricular activities can buffer against the negative impact of early life stress, as well as equip children with effective coping techniques that can be used throughout life. Across the lifespan, exercise, meditation, problem solving, and learning to seek out social support will serve as useful tools for these individuals to help them manage stress as they navigate through life. Finally, further research efforts should be made to help clarify links between childhood maltreatment and physical health problems in adulthood. A better understanding of these associations is necessary to effectively prevent health complications in the aftermath of abuse or to appropriately treat ailments that may emerge. Although this study found that perceived stress contributed to the physical health problems of women with a history of child abuse, future research projects should investigate whether this pathway remains after controlling for clinical diagnoses like depression and PTSD. This would help clarify the spectrum of symptoms associated with abuse. Research ventures that benefit from large sample sizes should explore the coping profiles of abuse survivors (i.e., high avoidance-low problem-focused vs. low avoidance-high problem-focused) between and across stressors. Intervention programs targeted at maladaptive coping techniques could be developed appropriately. Moreover,

only three physical health outcome variables were investigated in the current study. Future research should examine associations between CM and a broader class of physical problems, including medical disorders, physiological abnormalities, speed to recovery, and mortality. Understanding gender and cultural differences are also of critical importance. Trauma recovery programs should be specifically tailored to how these individuals experience, think about, and talk about stress and health. Finally, longitudinal treatment outcome studies should be conducted to assess the efficacy of stress-management on reducing physical health symptoms within vulnerable populations, such as CM survivors. Women with histories of abuse rely heavily on medical services and resources (Walker, Newman, & Koss, 2004). It is imperative that health professionals implement effective prevention and intervention strategies to alleviate this burden and to optimally serve this population.

### *Summary*

In summary, this study investigated associations among childhood maltreatment, perceived stress, coping strategies, and physical health outcomes. It was revealed that abuse in childhood predicts poorer physical health status in adulthood. However, findings suggest that physical and psychological maltreatment may have stronger relationships with this outcome compared to sexual abuse. Moreover, perceived stress appears to partially mediate the association between maltreatment and health. It was also found that emotion-focused coping helped to explain this indirect relationship, as this coping strategy accounted for the association between maltreatment and greater stress. In combination, however, perceived stress and emotion-focused coping only partially explained the link between maltreatment and physical health. This suggests that other

variables influence the association between abuse and physical health outcomes (e.g., psychological disorders, other traumatic events).

This study also identified three coping strategies (problem-focused, emotion-focused, and avoidance coping) as moderators of the pathways between child maltreatment and physical health. In particular, those who rely heavily on any of these coping strategies seem more likely to develop physical health problems following exposure to child maltreatment. It is possible that victimized women grasp at several coping techniques to manage the distress they experience throughout life. These attempts may actually be overexerting the body and exacerbating physical health problems. A single, problem-focused approach that is perceived as helpful would likely mitigate future stress and health problems within this population.

Finally, each form of maltreatment was examined as a unique predictor of the health outcomes. We found that child physical abuse has a unique relationship with health symptoms, while child psychological maltreatment is associated with greater functional impairment over and above the other abuse types. Readers are cautioned, however, that child abuse can better be understood as a cluster of interrelated experiences and its impact on health is revealed when the shared effects of all forms are examined.

In conclusion, this study adds to the literature that identifies child maltreatment as a significant risk factor for the development of physical health problems in later life. This project reveals perceived stress and coping strategies as important mechanisms through which early adverse experiences can impact health among women. The findings from this study have important implications for health professionals and provide a foundation for future research, which can better inform treatment and policies for victimized individuals.

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Appendix A

February 27, 1998

Dear Doctor/Clinician,

We are a Registered Psychologist and Doctoral Candidate in Clinical Psychology from the University of Victoria, and are conducting a study of women's health and relationships. We hope to enlist your support for our project, described below.

Our project, the "Women's Health and Relationships Study", looks at a variety of current and historical factors (including victimization experiences) that impact on women's current physical and mental health and interpersonal relationships. We are interested in interviewing women age 18 or older, of any marital status, income level, or sexual orientation. Following a telephone screening interview, participation will involve the completion of a questionnaire as well as participation in a detailed interview with a highly trained interviewer. Participants will receive a small cash payment for their time and, if they wish, their names will be entered in a cash draw at the end of the study.

We intend to recruit participants from a clinical and community sample. Although gathering data for applied research such as ours can be challenging, we hope that our results will prove useful to people such as yourself who work with women in our community. Your co-operation will be invaluable in allowing us to recruit a sample that is as diverse and representative as possible.

No counselling will be provided by the interviewer, but a list of referrals will be provided to all participants. Every effort will be made to protect the psychological well-being of participants, and interviews will be discontinued in the unlikely event that the participant experiences significant distress.

*We respectfully request that you post the enclosed poster & brochures in your waiting room or other area where your adult female clients/patients will be able to view them.*

If you should have questions about the study, or about the materials we have provided, please call Diane Roche at our office (472-4294) or Marsha Runtz (721-7546). In advance, we thank you very much for your assistance and appreciate your support. When we complete the study, we would be more than happy to provide you with a summary of our findings upon your request (call 472-4294).

Sincerely,

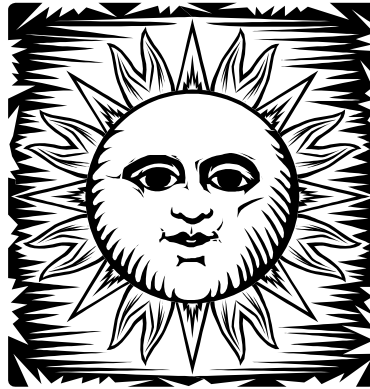
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Diane Roche, M.A.  
Doctoral Candidate in Clinical Psychology

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Marsha Runtz, Ph.D., R.Psych.  
Assistant Professor of Psychology  
Registered Psychologist #1076

Appendix B



***WOMEN'S HEALTH  
& RELATIONSHIPS STUDY***

---

*Diane Roche, M.A. & Marsha Runtz, Ph.D.  
Department of Psychology  
University of Victoria*

**RESEARCH PARTICIPANTS NEEDED**

*\$20 Honorarium Paid to Participants*

*Please call (24 hours):*

*Diane Roche (250) 472-4294*

*For more information, please take a brochure  
(see below) or call us anytime.*

Appendix C  
**WOMEN'S HEALTH & RELATIONSHIPS STUDY**  
**CONSENT FORM**

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I understand that this research project is a study of women's health concerns and women's relationships, and as such, will inquire about interpersonal relationships and about a variety of physical and psychological health concerns that many women may have. My participation involves answering questions on a self-report questionnaire and in an individual interview. I am aware that some of the questions are personal in nature, and may include questions about sexual and medical history.

I understand that my participation is completely voluntary, and that I may withdraw from the study at any time, without explanation. I am also aware that if I do withdraw from the study, I will still obtain compensation for my participation.

I have been assured that my responses are completely confidential, and that at the end of the study, my name will not be linked to my responses in any way. My responses will be identified by number only, and this coded number on the questionnaire cannot identify me. I have been informed not to put my name on any materials. I have also been asked to provide this consent form to the researcher prior to filling out the questionnaires. The consent form will not be stored with the responses I provide. I have been told that all research materials will be kept in a secure/locked room, and that only members of the research team will have access to this information.

I have been given the *Participant Information Sheet*. At the end of my participation I will receive additional written information about the purposes of the study. Due to the personal and sensitive nature of this study, I will also be provided with the telephone number of the researchers and of a community agency where I can obtain appropriate mental health referrals if I wish to, should I have any concerns arising as a result of this study. In addition, a more extensive list of community agencies is available.

Having been informed of the nature of this study and the extent of my participation, and having been assured of the confidentiality of my responses, I willingly consent to participate in this study as denoted by my signature at the bottom of this page.

Researchers: Diane Roche, M.A.  
Psychology Department  
University of Victoria  
Rm. 58 L-Hut  
(250) 472-4294

Dr. Marsha Runtz  
Psychology Department  
University of Victoria  
A194 Cornett Bldg.  
(250) 721-7546

Appendix D

*WOMEN'S HEALTH & RELATIONSHIPS STUDY*

*PARTICIPANT INFORMATION SHEET*

- Your participation will involve approximately 2 to 3 hours of your time, including 1 to 2 hours spent completing questionnaires, and a 45 minute to 1 hour individual interview. Topics include current health and health history, family environment, early sexual experiences, and relationships.
- You will be paid a \$20 honorarium to thank you for your time.
- If you wish, we will enter you in a draw for prizes of \$250, \$150, & \$100, to be drawn after 100 participants have completed the study.
- Some of the questions may be sensitive and personal in nature.
- You have the right to refuse to answer a question, or to withdraw your participation in the study at any time (without losing your \$20 payment).
- Information provided by you in this study will be kept confidential, except for the following situations, in which we are required to break confidentiality:
  - You tell us of your intent to seriously harm yourself or others,
  - You tell us about a minor who is being abused,
  - Our interview notes are subpoenaed in a court case (this is highly unlikely).
- If you have been, are currently, or in the future are a client of any of the researchers, information provided as part of this study will be kept confidential, and will not be used for clinical purposes.
- This is a research study, so no counselling will be provided.
- Signature: \_\_\_\_\_ Date: \_\_\_\_\_
- Witness: \_\_\_\_\_

Appendix E

**WOMEN'S HEALTH & RELATIONSHIPS STUDY:  
PURPOSE OF STUDY**

We would like to thank-you for participating in this study of women's health and relationships. Your responses are greatly appreciated because we realize that many of these questions were personal and perhaps not easy to answer. Please be assured that your responses will remain confidential. Because we are interested in responses from large groups of people (rather than any particular individual), your answers will only be analyzed in combination with all other subjects' responses.

One of the main purposes of this study is to develop a checklist of women's health concerns. While a number of health questionnaires exist, many do not cover the types of concerns that many women may have about their health. We are particularly interested in the types of health concerns that women are dealing with and how they relate to their use of medical services. We hope that the resultant "Women's Health Inventory" will be useful in the assessment of women's health needs and concerns in a variety of situations.

Another central purpose of this study is to understand the impact of attachment relationships on psychological adjustment. We believe that attachment relationships play an important role in predicting psychological adjustment. In addition, we believe that attachment relationships might be "protective" for women with difficult histories. For example, women who were abused in childhood, but who also experienced supportive secure attachment relationships might suffer less psychological distress than women who were also abused but did not have such relationships.

In addition to these two central purposes, we are very interested in the relationship between a number of life experiences and women's current health status, psychological adjustment, and use of medical services. In particular, we are interested in the role of both current and past life stress as potential influences on present physical and psychological health. There is some evidence to suggest that early life stress (such as some types of unwanted early sexual experiences and early experiences with physical aggression) may be associated with reports of certain health concerns and with later difficulties in interpersonal relationships. Similarly, current day-to-day stressors may also contribute to greater health concerns and use of medical services. These are the main questions that the research that you have participated in will be exploring. While not every question about the link between life stress and health can be answered by this study, we hope to begin to address some of the issues that may be of greatest concern to women.

We appreciate your participation in this study, and hope that this has been an educational experience for you. If you have any questions or concerns about this study, please contact Diane Roche or Marsha Runtz. We will be happy to respond to any questions or concerns that you may have about this research. Once the study has been completed, a short summary of the final results will be available from the researchers.

If any of the questions you answered here made you uncomfortable in any way, or if participating in this study has brought up issues that are distressing for you, a resource which might be of assistance is provided below. Further referrals can be obtained either from that agency, or from the researchers.

Community Agency:                      NEED Crisis and Information Line: (250) 386-6323

Appendix F  
**WOMEN'S HEALTH & RELATIONSHIPS STUDY  
RESOURCE LIST**

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Below is a list of mental health and counseling services that may be of use to you. This list is not intended to be exhaustive. Our goal is to help you make a start on finding services, should you need them. These agencies should be able to provide further referrals.

**EMERGENCY MENTAL HEALTH SERVICES** 386-6323  
Access through NEED Crisis & Information Line

- Serves people in the Capital Health Region experiencing urgent mental health crises including those with mental illness concerns.

**NEED CRISIS AND INFORMATION LINE** 386-6323

- Open to callers of any age, mainly in the Capital Health Region.

**ADULT MENTAL HEALTH SERVICES** 952-4410  
Victoria Mental Health Centre, 2328 Trent Street, Victoria, BC

- Serves adult residents of Victoria and Saanich.

**VICTORIA WOMEN'S SEXUAL ASSAULT CENTRE** 383-5545  
24-hour crisis line 383-3232

- Serves women who have experienced sexual abuse or assault.

**VICTORIA WOMEN'S TRANSITION HOUSE** 24-hour helpline 385-6611  
Box 5986 Station B, Victoria, BC V8R 6S8

- Serves women leaving abusive relationships.

**WESTERN COMMUNITIES MENTAL HEALTH CENTRE** 474-1265  
104-3179 Jacklin Road, Victoria, BC

- Serves residents of Langford, Colwood, View Royal, Metchosin, Sooke, Port Renfrew to the Malahat District.

Appendix G

INTERVIEW

**WOMEN'S HEALTH AND RELATIONSHIPS STUDY**

Date: \_\_\_\_\_ Q. Order (circle): 1 2 Code Number: \_\_\_\_\_

Recruiting source/place participant saw brochure (*be specific*): \_\_\_\_\_

PART ONE: DEMOGRAPHICS

*"I'm going to start with some questions about basic demographics".*

1. How old were you on your last birthday? (*age in years*) \_\_\_\_\_
  
2. What is your marital status?
  1. single, never married
  2. married
  3. living with partner
  4. separated
  5. divorced
  6. widowed
  
7. Do you have children? no = 0 yes = 1 (If yes) How many? \_\_\_\_\_
  
8. Are you a Canadian citizen?
  - yes = 1
  - no = 0 (If no) What is your citizenship? \_\_\_\_\_
  
9. What is your race? (*Write in specifics; if category unclear use other; do not read list*)  
Caucasian = 1 First Nations = 2 Black = 3  
Asian = 4 Indian = 5 Mixed = 6 (Specify) \_\_\_\_\_  
Other = 7 (Specify) \_\_\_\_\_
  
10. What ethnic or cultural group do you most closely identify with? (*Not incl. only 'philosophical' ethnic identification, with no family ties – eg I like Eastern philosophy*)
  
11. What level of education have you completed?  
\_\_\_\_\_
  
12. What is your occupation?  
\_\_\_\_\_
  
13. What is your current employment status? (*use list only to clarify*)
  1. full-time student
  2. employed full time
  3. employed part time
  4. homemaker
  5. unemployed
  6. disabled (*specify nature of disability*) \_\_\_\_\_
  7. retired
  8. other (*specify*) \_\_\_\_\_
  
16. How much education did your father complete?

---

17. How much education did your mother complete?

---

22. What is your current household gross income per year?

*(explain if needed → amount earned by all contributing members of the household)*

less than \$10,000

10,000 – 19,999

20,000 – 29,999

30,000 – 39,999

40,000 – 49,999

50,000 – 59,999

60,000 – 69,999

70,000 – 79,000

80,000 or more

23. How many people contribute to the household income? \_\_\_\_\_

24. How many people depend on the income? \_\_\_\_\_

Appendix H

**PART FIVE: PHYSICAL ABUSE/FAMILY VIOLENCE**

*Some people have experienced physical punishment as a child. I would like to ask you about some such experiences you might have had before your 18<sup>th</sup> birthday. Please answer how often one of your parents (or parental figures – specify*

*\_\_\_\_\_ ) did the following things to you, using the following scale:*

0 = never    1 = rarely    2 = sometimes    3 = often    4 = very often

**\*\* Not including behaviours exclusive to sexual abuse incidents, and already described.**

	Mom	Dad	Other
1. Spank you hard enough to cause bruising, swelling, or bleeding	_____	_____	_____
2. Twist, yank, or bend your leg, arm, or finger in a painful manner	_____	_____	_____
3. Push, throw, or knock you down or into an object such as a wall or piece of furniture	_____	_____	_____
4. Hit or punch you with a closed fist	_____	_____	_____
5. Burn or scalded you on purpose*	_____	_____	_____
6. Harm you physically with a weapon or other dangerous object*	_____	_____	_____
7. Break your bone(s) or teeth when they were being rough or violent with you*	_____	_____	_____

\* Severe Physical Abuse items

Appendix I

**Childhood Maltreatment Questionnaire**

Please circle the appropriate number on the form that corresponds to the following scale:

Never	Rarely	Sometimes	Often	Very Often
1	2	3	4	5

**How often before you were 18 did one or more of your parental figures:**

1. Try to control or run your life
2. Allow or encourage you to steal
3. Call you insulting names
4. Act emotionally "cold" towards you
5. Take things that belonged to you without asking you or without replacing them
6. Fail to provide adequate clothing for you even though they had the means to do so
7. Touch or handle you in a rough way that frightened you
8. Tell you, or otherwise imply to you, that they would be happier without you
9. Have unpredictable and changing expectations of you
10. Scream or yell at you
11. Push a member of your family around when you were present
12. Become impatient, angry, or hostile whenever you expressed an opinion or questioned something they said
13. Permit or encourage you to tell lies or to deceive people
14. Make negative comments to you, such as tell you that you were stupid, ugly, clumsy, lazy, or weak
15. Appear to be disinterested in you and your life



4. little

5. none

## Appendix K

### PERCEIVED STRESS SCALE

The questions in this scale ask you about your feelings and thoughts *during the last month*. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer each question fairly quickly. That is, don't try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate. For each question, choose from the following alternatives:

- 0. never**
- 1. almost never**
- 2. sometimes**
- 3. fairly often**
- 4. very often**

1. In the last month, how often have you been upset because of something that happened unexpectedly? \_\_\_\_\_
2. In the last month, how often have you felt that you were unable to control the most important things in your life? \_\_\_\_\_
3. In the last month, how often have you felt nervous and "stressed"? \_\_\_\_\_
5. In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life? \_\_\_\_\_
6. In the last month, how often have you felt confident about your ability to handle your personal problems? \_\_\_\_\_
8. In the last month, how often have you found that you could not cope with all the things that you had to do? \_\_\_\_\_
9. In the last month, how often have you been able to control irritations in your life? \_\_\_\_\_

Appendix L  
*Coping Inventory for Stressful Situations*

*The following are ways people react to various difficult, stressful or upsetting situations. Please circle a number from 1 to 5 for each item. Indicate how much you engage in these types of activities when you encounter a difficult, stressful or upsetting situation (Not At All to Very Much)*

Problem-focused coping items:

1. Schedule my time better.
2. Focus on the problem and see how I can solve it
3. Outline my priorities

Emotion-focused coping items:

1. Feel anxious about not being able to cope
2. Become very upset
3. Blame myself for having gotten into this situation

Avoidance coping items:

1. Take time off and get away from the situation.
2. Buy myself something
3. Eat a meal

Appendix M

**HEALTH SYMPTOM CHECKLIST (HSC)**

Below is a list of physical complaints that women sometimes experience (in this questionnaire we are concerned about symptoms that are **not** exclusively associated with your menstrual period). Please mark the symptoms which you have experienced *in the past six months*, indicating how often you experience each of them. If you have *not* experienced a particular symptom, leave that item blank. Please use the following scale:

- 1 = experienced *occasionally* in the last six months**
- 2 = occurs about once a month**
- 3 = occurs about once a week**
- 4 = occurs several times a week**
- 5 = occurs daily**

- |   |       |  |       |
|---|-------|--|-------|
| 1. Abdominal pain                                   | _____ | 21. Diarrhoea                                    | _____ |
| 2. Allergy  | _____ | 22. Stomach flu                                  | _____ |
| 3. Genital pain                                     | _____ | 23. Pelvic pain                                  | _____ |
| 4. Eczema   | _____ | 24. Muscle weakness                              | _____ |
| 5. Pain in inner thighs                             | _____ | 25. Stomach aches                                | _____ |
| 6. Gastric ulcer                                    | _____ | 26. Muscle stiffness                             | _____ |
| 7. Painful urination                                | _____ | 27. Constipation                                 | _____ |
| 8. Convulsions                                      | _____ | 28. Tunnel vision                                | _____ |
| 41. Temporary blindness                             | _____ | 49. Weakness                                     | _____ |
| 42. Bleeding between                                | _____ | 50. Double vision                                | _____ |
| 43. Pain in the small<br>of your back               | _____ | 51. Pain in arms<br>or legs                      | _____ |
| 44. Face pain                                       | _____ | 52. Nausea                                       | _____ |
| 45. Eye pain associated<br>with reading             | _____ | 53. Joint pain                                   | _____ |
| 46. Difficulty swallowing                           | _____ | 54. Get sick from<br>different kinds<br>of foods | _____ |
| 47. Burning sensation in<br>sexual organs or rectum | _____ |  |       |
| 48. Sore throat                                     | _____ | 55. Other (briefly describe):                    | _____ |

Appendix N

**FUNCTIONAL IMPAIRMENT SCALE**

**Please indicate the extent to which your health problems have interfered (if at all) with various aspects of your life during the past 6 months:**

**1 = Not at all    2    3    4    5 = A great deal**

1. My work (or school) performance has suffered because of my health problems.
2. My health problems have prevented me from sleeping well.
3. My health problems have interfered with my sex life.
4. My health problems have interfered with my social life.

**Please indicate the extent to which you agree or disagree with the following statements in relation to your physical health:**

**Disagree Strongly = 1    2    3    4    5 = Agree Strongly**

5. I find I am bothered by my symptoms.
6. My symptoms affect the way I get along with my family or friends.
7. My symptoms interfere with my life a great deal.

Appendix O

Table 5

*Percent of Participants Reporting Child Physical Abuse (CPA) Symptoms at Each Frequency Level*

CPA Items	Frequency before age 18												Any CPA		
	Rarely			Sometimes			Often			Very Often			Mom	Dad	OPF
	Mom	Dad	OPF	Mom	Dad	OPF	Mom	Dad	OPF	Mom	Dad	OPF			
Spank you	11	12	2	2	6	1	6	2	2	3	1	4	21	22	9
Twist/yank body	9	5	4	3	6	4	4	1	2	1	1	2	17	13	12
Push/throw you	7	8	5	6	4	3	4	2	2	2	1	2	20	14	12
Hit/punch you with closed fist	3	2	5	2	2	4	2	1	1	1	1	2	8	5	11
Burn/scald you on purpose*	3	0	<1	0	0	1	0	0	0	<1	<1	1	3	<1	2
Harm you with weapon*	0	1	1	2	1	1	2	1	1	1	1	2	5	4	5
Break bones *	<1	2	1	<1	0	0	0	0	0	<1	<1	1	1	3	2

*Table continued*

CPA Items	Rarely			Sometimes			Often			Very Often			Any CPA		
	Mom	Dad	OPF	Mom	Dad	OPF	Mom	Dad	OPF	Mom	Dad	OPF	Mom	Dad	OPF
Beat you up	2	1	3	2	2	4	2	1	1	3	1	2	8	5	9
Hit/slap you with open hand	26	15	6	10	8	6	7	3	1	5	2	3	49	28	16
Strike you with foot/ knee	3	2	6	2	3	2	2	<1	2	1	<1	2	8	5	11
Throw object at you	5	1	3	4	2	2	1	<1	<1	2	<1	1	12	4	7
Pull hair/ ear	10	3	3	7	2	6	6	1	3	2	1	1	25	7	12
Choke you*	2	<1	3	<1	<1	2	0	<1	0	<1	<1	1	3	2	5
Hit you with belt/ stick/utensil	19	14	2	11	10	3	6	3	2	4	1	3	40	28	11
Torture you physically*	0	<1	1	2	<1	<1	1	0	<1	1	<1	1	3	1	3
Try to kill you*	1	<1	2	<1	0	0	0	0	0	1	<1	<1	3	1	3

Note. Values are in percentages based on n reporting for each item. OPF = other parental figure. \* denotes severe items.

Appendix P

Table 6

*Percent of Participants Reporting Child Psychological Maltreatment (CPM) Symptoms at Each Frequency Level*

CPM items	Frequency before age 18				Any CPM
	Rarely	Sometimes	Often	Very Often	
Try to control your life	15	28	25	26	94
Encourage you to steal	4	<1	<1	0	5
Insult you	19	20	15	11	65
Act "cold" to you	18	26	19	23	86
Take your things	20	11	6	5	42
Do not provide adequate clothing	11	4	3	4	21
Touch you in rough way	18	15	9	12	54
Tell you they would be happier without you	14	20	6	11	52
Have unpredictable expectations of you	23	19	14	10	65
Scream/yell at you	23	29	19	22	92
Push family member around in front of you	18	19	8	15	59

*Table continues*

CPM Items	Rarely	Sometimes	Often	Very Often	Any CPM
Become impatient when you expressed self	18	27	22	19	85
Encourage you to lie/cheat/deceive people	8	5	1	1	15
Make negative comments to you	17	20	15	17	70
Appear to be disinterested in you	17	20	18	15	70
Make you cater to them	17	16	13	10	56
Did not allow you to participate in school/community activities	18	15	6	7	46
Fail to feed you properly	7	3	1	2	13
Throw object at you that could not hurt	12	10	4	3	28
Impressed on you that you were unwanted	17	21	12	16	65
Have many unpredictable moods that affected their ability to care for you	20	15	11	17	64
Threaten to give you a beating	12	19	9	14	54
Physically harm family member	11	7	2	4	24

*Table continues*

CPM Items	Rarely	Sometimes	Often	Very Often	Any CPM
Permit/encourage you to vandalize	2	1	<1	<1	4
Disregard your input into decisions	23	20	17	15	76
Criticize/belittle/shame you in front of people	24	25	14	11	73
Ignore you	24	27	14	14	78
Take advantage of you	20	18	8	7	53
Refuse to allow you to participate in social activities	28	19	8	7	61
Leave you alone for inappropriate periods of time	12	15	8	7	41
Take your possessions to "hurt" you	10	11	2	5	28
Implied they did not like/value you	20	18	12	17	67