The Role of Health Risk Behaviours in the Link between Posttraumatic Stress Symptoms and Physical Health among Women with Histories of Interpersonal Trauma

by

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B.Sc., University of Toronto, 2004
M.Sc., University of Victoria, 2007

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Supervisory Committee

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Abstract

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Women with histories of interpersonal trauma (physical, sexual, or psychological abuse experienced during childhood, adolescence, and adulthood) are more likely to experience posttraumatic stress symptoms (PTSS) and to develop physical health problems than women without trauma histories. In fact, PTSS and posttraumatic stress disorder (PTSD) have been established in the literature as mediators of the relation between interpersonal trauma and physical health outcomes (e.g., Resnick et al., 1997; Schnurr & Green, 2004). What remains to be determined is a clear understanding of the various mechanisms explaining why individuals with trauma histories, and subsequently PTS symptoms, go on to develop physical health problems. The purpose of this study was to examine the role of health risk behaviours, specifically sexual risk taking and substance use, as possible mechanisms through which interpersonal trauma and PTSS might influence physical health. These relations were examined, through structural equation modelling, in a sample of 475 women currently attending university. Models were tested separately for sexual traumas (childhood sexual abuse and sexual assault experienced during adolescence and adulthood) and nonsexual interpersonal traumas (physical and psychological maltreatment by parents in childhood, witnessing violence between

parents, and intimate partner violence in their own relationships). Results indicated that PTSS severity partially mediated pathways from both types of interpersonal trauma, sexual and nonsexual, to adverse health outcomes, contributing to the existing theory that one's psychological response to a trauma may be more important in determining physical health outcomes than the trauma itself. Furthermore, a significant indirect pathway was found to link nonsexual trauma to risky sexual behaviours through PTSS severity. In addition, PTSS severity fully mediated the relation between nonsexual trauma and substance use behaviours. These latter findings suggest that the likelihood of engaging in substance use and/or risky sexual behaviours may be greater in trauma survivors who are suffering from posttraumatic stress symptoms. Contrary to hypotheses, no significant pathways were found from risky sexual behaviours or substance use to physical health outcomes in the context of trauma variables and PTSS severity. Consequently, these health risk behaviours were not found to operate as mechanisms explaining the link from PTSS severity to physical health outcomes. Limitations and alternative hypotheses are presented. Implications for clinical interventions and recommendations for future research are discussed.

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Acknowledgments

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[1] Voltaire (1759).

Dedication

For my late grandmother, Muriel (Rowe) MacKenzie, who offered me unconditional support, guidance, and warmth throughout my life, and who taught me to cherish the educational process and, along with it, each and every opportunity to learn.

Introduction

The association between interpersonal trauma and women's health is well documented in the research literature (e.g., Campbell, 2002; Cloitre, Cohen, Edelman, & Han, 2001; DeMaris & Kaukinen, 2005; Golding, 1996; Latthe, Mignini, Gray, Hills, & Khan, 2006; Resnick, Acierno, & Kilpatrick, 1997; Spertus, Yehuda, Wong, Halligan, & Seremetis, 2003; Wadsworth & Records, 2013; Weissbeck & Clark, 2007).

Similarly, the contribution of trauma-related mental health problems such as posttraumatic stress disorder (PTSD) to physical health outcomes has been well-researched (e.g., Clum, Nishith, & Resick, 2001; Haagsma et al., 2012; Kimerling, Clum, McQuery, & Schnurr, 2002; Schnurr & Jankowski, 1999). Nevertheless, the mechanisms through which these pathways operate are not yet clear. The goal of the present study was to investigate health risk behaviours as a possible mechanism through which interpersonal trauma and posttraumatic stress impact physical health outcomes.

Starting first with some key definitions, *interpersonal trauma* is a term that refers to incidents of violence perpetrated in an interpersonal context (i.e., by one or more individuals towards one or more individuals). Interpersonal trauma is also often referred to as interpersonal violence or interpersonal victimization. The World Health Organization's (WHO) *World Report on Violence and Health* defines violence as "the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation" (Krug, Dahlberg, Marcy, Zwi, & Lozano, 2002, p. 5). Focusing specifically on interpersonal violence, the WHO specifies two subcategories: family and intimate partner violence (physical, sexual,

psychological, or neglectful maltreatment of family members and intimate partners) and community violence (acts of violence between individuals who may or may not know each other).

In the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR), the American Psychiatric Association (APA; 2000) defines trauma as an event involving "actual or threatened death or serious injury, or a threat to the physical integrity of self or others" (p. 463). The recently released *DSM-5* (APA, 2013) adds "sexual violence" to the above list (p. 271). Taken together, this suggests consistency with the WHO definition of violence. Thus, for the purposes of this paper, interpersonal trauma, violence, and victimization will be used interchangeably to describe physical, sexual, and psychological assaults or abuse and the experience of witnessing interpersonal violence.

Interpersonal trauma can occur at any point across the lifespan, both within and outside of family environments and intimate relationships. Collectively, different types of interpersonal violence against women are quite prevalent both in the general population and among university students. Campbell, Greeson, Bybee, and Raja (2008) state that one in every two women will experience one or more forms of interpersonal trauma in her lifetime. Specific prevalence rates vary based on the population, methods of assessment, and definitions of what constitutes victimization, among other factors (Johnson, 1996; Roosa, Reyes, Reinholtz, & Angelini, 1998). Typically, interpersonal victimization is divided into three forms: physical, psychological, and sexual maltreatment. The witnessing of violence (e.g., observing or being exposed to parental intimate partner violence) is also considered a form of interpersonal trauma. In addition,

victimization is often measured separately for experiences in childhood and experiences in adolescence or adulthood, using 14 or 18 years of age as the division between groups.

Beginning with childhood experiences, prevalence rates for physical abuse in childhood (CPA) range from 8% to 36% with relatively similar rates in both community (Dong, Dube, Giles, & Felitti, 2003; Scher, Forde, McQuaid, & Stein, 2004) and university samples (Briere, Kaltman, & Green, 2008; Demaré & Briere, 1994; Runtz & Roche, 1999). For example, a large Canadian community sample of adolescents and adults found that 20% of women in the study endorsed a history of CPA (Walsh, MacMillan, & Jamieson, 2002). Rates of child psychological maltreatment (CPM) can vary widely depending on how inclusive a definition is used. For instance, almost all individuals will endorse at least one item on a continuous measure of CPM (e.g., "did your parents criticize you?") because these experiences are relatively common at low frequencies (Briere et al., 2012; Daro & Gelles, 1992; Straus, Hamby, Finkelhor, Moore, & Runyan, 1998; Van Bruggen, Runtz, & Kadlec, 2006; Wolfe & McIsaac, 2011). However, assessments of repeated and persistent experiences of psychological or emotional abuse in childhood tend to yield estimates of 11% to 22% (Edwards, Holden, Felitti, & Anda, 2003; Felitti et al., 1998; Finzi-Dottan & Karu, 2006; Mullen, Martin, Anderson, Romans, & Herbison, 1996; Scher et al., 2004; Spertus et al., 2003). Similarly, psychological neglect in childhood, which is sometimes considered within the category of psychological maltreatment, is also a dimensional construct and can be difficult to define. Furthermore, this type of child maltreatment is researched far less and is more difficult to identify than other forms of abuse (Barnet, Miller-Perin, & Perin, 2005; Wright, Crawford, & Del Castillo, 2009). Nevertheless, rough estimates range

from 11% to 38% (Paivio & Cramer, 2004; Baker & Festinger, 2011; Spertus et al., 2003), suggesting that emotional neglect is at least as common, if not more so, than other forms of childhood maltreatment.

To get a sense of recent prevalence rates for child sexual abuse (CSA), Putnam (2003) reviewed empirical articles regarding CSA published from 1990 forward. Results showed that community prevalence rates ranged from 12% to 35% for women reporting a history of unwanted sexual experiences prior to age 18. In a unique study of children aged 10 to 16 years, Finkelhor and Dziuba-Leatherman (1994) found that attempted and completed CSA was reported by 10.5% of the sample. Childhood exposure to parental intimate partner violence is rarely examined in epidemiological studies of victimization. However, Felitti and colleagues (1998) found rates of approximately 12% in their study of adverse childhood experiences while 16% of women in a sample of university students reported observing domestic violence between their parents (Van Bruggen, 2009).

Turning to adolescent and adult experiences of interpersonal violence, reported lifetime prevalence rates for sexual assault experiences range from approximately 20% to 50% of women (Koss, 1993; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993) with university students often reporting at the higher end of this spectrum (Eadie, Runtz, & Spencer-Rodgers, 2008; Koss, Gidycz, & Wisniewski, 1987; Tansill, Edwards, Kearns, Gidycz, & Calhoun, 2012). In their Violence Against Women Survey, Statistics Canada (1993) found 4 out of 10 Canadian women have been sexually assaulted at some point in their lives. Finally, intimate partner violence (IPV) is reported by approximately 22% to 25% of women (Bauer et al., 2002; Elliott & Briere, 2003; Tjaden & Thoennes, 2000). Among college and university women, reported rates are closer to 30% for physical

aggression perpetrated against female partners in romantic relationships (Hines & Saudino, 2003; Perry & Fromuth, 2005).

Taken together, it is not surprising that at least one in two women will experience at least one of these forms of interpersonal violence across her lifetime (Campbell et al., 2008). Unfortunately, many studies examine rates and effects of victimization by individual type (e.g., CSA, CPA, ASA, or IPV) rather than collectively, making it difficult to establish a sense of the frequency and impact of interpersonal violence, as a whole, in the population. Nevertheless, researchers in the field of interpersonal trauma often stress the importance of studying multiple forms of victimization in the same sample, particularly when looking at physical health outcomes (Bohn & Holz, 1996; Campbell et al., 2008; Runtz, 2002; Runtz & Godbout, 2010).

Because different forms of victimization do not typically occur in isolation (Dong et al., 2003; Higgins & McCabe, 2000; Scher et al., 2004; Tjaden & Thoennes, 2000), examination of one type of abuse without accounting for the contribution of others runs the risk of over-attributing outcomes to that particular form of victimization. Furthermore, cumulative interpersonal trauma, or experiencing multiple victimizations across the lifetime, can have additive or interactive effects resulting in more severe traumatization and worse psychological and physical health outcomes (Briere & Jordan, 2004; Briere et al., 2008; Campbell et al., 2008; Edwards et al., 2003; Follette, Polusny, Bechtle, & Naugle, 1996; Hedtke et al., 2008).

Turning now to one of the primary psychological outcomes associated with interpersonal trauma, *posttraumatic stress disorder* (PTSD) is a mental health disorder that develops in approximately 8 to 14% of men and 20 to 30% of women following

exposure to a traumatic event (PTSD; Breslau, Davis, Andreski, & Peterson, 1991; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Resnick et al., 1993). The *DSM-IV-TR* diagnostic criteria for PTSD consist of three sets of symptoms that last for at least a month. Specifically, these criteria include indications that the traumatic event is being reexperienced through disturbing flashbacks, dreams, or intrusive thoughts, the avoidance of stimuli associated with the trauma combined with a numbing of emotional responsiveness, and symptoms that indicate increased physiological arousal, such as concentration problems and sleep disturbances (APA, 2000). However, it is important for investigators to also assess subclinical levels of posttraumatic stress symptoms (PTSS) in order to capture moderate to severe symptoms that may be present in one or more of the above areas but without complete fulfillment of diagnostic criteria. Like full PTSD, subthreshold PTS symptoms can cause significant distress and adjustment difficulties (Black, 2004; Zlotnick, Franklin, & Zimmerman, 2002) and have been associated with physical health problems (Yarvis, Bordnick, Spivey, & Pedlar, 2005).

The outcome variable to be examined in the present study consists of a set of health-related outcomes. *Physical health outcomes* are a multidimensional range of potential indicators and representations of physical health status. Such outcomes can vary from specific symptoms (e.g., localized pain) to broader perceptions of overall health and from objective indicators (e.g., medical tests) to subjective judgments of one's well-being. Because of the multidimensionality of physical health, a person's complete health status is difficult to determine by one or more measures. As such, a range of health outcomes can provide an approximation of different components of physical health (e.g., physical symptoms, health perceptions, health-related functional impairment).

Nevertheless, there continue to be limitations around completely and accurately assessing physical health status. The important role of broader social determinants of health (e.g., income, education, physical and social environments, access to health care, etc.) must also be acknowledged. Sociodemographic variables will be assessed and analyzed as part of the present study and various social determinants will be discussed as they pertain to the literature and the findings; however, a full review and examination of the many social determinants of health is beyond the scope of this study.

Interpersonal Trauma, PTSS/PTSD, and Physical Health

A large body of research has investigated the association among interpersonal trauma, PTSS/PTSD, and physical health outcomes. With clear links between interpersonal trauma and physical health problems (e.g., Resnick et al., 1997; Maniglio, 2009) as well as between PTSD and adverse health outcomes (e.g., Schnurr & Jankowski, 1999), researchers have begun to examine PTSS/PTSD as an important mediator in the relation between trauma exposure and physical health problems (Eadie, et al., 2008; Green & Kimerling, 2004; Resnick et al., 1997; Schnurr & Jankowski, 1999; Wachen et al., 2013). That is, it is thought to be an individual's psychological response to the trauma that negatively impacts her physical health, rather than the actual trauma experience itself. This hypothesis is supported by a range of literature showing that following exposure to trauma, considerably more physical health problems are reported among individuals who develop PTSD or significant subclinical levels of PTSS compared to those without such symptoms (see Green & Kimerling, 2004 for a review). Moreover, this often appears to be a graded association such that increasing trauma severity and/or increasing severity of PTSS is associated with worsening health problems

(Koss, Koss, & Woodruff, 1991a; Runtz, 2002; Springs & Friedrich, 1992; Wadsworth & Records, 2013).

Based on this literature, Schnurr and Green (2004) developed a model, proposing that PTSD is the primary pathway through which trauma exposure leads to adverse physical health outcomes. While physical symptoms are a recognized component of many psychological disorders (e.g., depression, panic disorder, etc.), researchers have shown that the association between PTSD and adverse physical health outcomes remains after controlling for other disorders (Andreski, Chilcoat, Breslau, 1998; Schnurr & Jankowski, 1999; Weisberg et al., 2002; Zoellner, Goodwin, & Foa, 2000). Moreover, some authors suggest that PTSD is the *only* disorder that adequately explains physical health problems in the context of trauma exposure (Schnurr & Green, 2004).

With a strong theoretical and empirical foundation in place, the next direction is to consider the role of specific mechanisms that intervene and, perhaps, account for the association between posttraumatic stress symptomatology and adverse physical health outcomes among survivors of interpersonal trauma. In particular, health risk behaviours play a key role in this regard.

Role of Health Risk Behaviours

Health risk behaviours are defined as "those actions that increase an individual's risk for illness and health-related problems" (Rheingold, Acierno, & Resnick, 2004, p. 217). Substance use and risky sexual behaviours (e.g., multiple sexual partners, unsafe sexual practices, early onset of sexual activity) are two types of health risk behaviours that are particularly relevant in the context of interpersonal trauma and PTSS. Theoretically, it is proposed that PTS symptoms resulting from interpersonal trauma

increase the likelihood of an individual engaging in health risk behaviours. These same behaviours have two primary negative consequences: they increase risk for and severity of physical health problems (Douglas et al., 1997). In addition, these behaviours can interfere with the process of resolving PTSS (Briere, 1996). Because the psychological symptoms are maintained rather than resolved, the likelihood of continuing to engage in health risk behaviours is further increased, thus perpetuating a potentially destructive cycle linking trauma, PTSS, health risk behaviours and, consequently, physical health problems. In order to better understand these associations, it is important to take a detailed look at the links between specific health risk behaviours and the key variables involved, beginning first with substance use and abuse.

Substance use. The adverse effects of smoking, alcohol abuse, non-medical use of prescription drugs, and illicit drug use on physical health are well documented. For example, cigarette smoking has been strongly linked to lung cancer, coronary heart disease, respiratory diseases, and eventually death (Federal, Provincial and Territorial Advisory Committee on Population Health [FPT Advisory Committee], 1999; Rehm et al., 2006; Thun et al., 2013). Chronic and excessive alcohol use can lead to liver disease and cirrhosis, gastritis, ulcers, gastrointestinal cancers, and cardiomyopathy (APA, 2000; FPT Advisory Committee, 1999; Rehm et al., 2006), while acute alcohol use is linked to accidental injury and death, primarily due to motor vehicle collisions (FPT Advisory Committee, 1999). Finally, illicit drug use and non-medical use of prescription drugs have been associated with health problems ranging from chronic malnutrition to Hepatitis C and HIV infections, as well as accidental and intentional overdose causing death (APA, 2000; Rehm et al., 2006; World Health Organization [WHO], 1997).

Interpersonal trauma and substance use. Numerous studies have documented an association between interpersonal trauma and substance use (e.g., Dansky, Saladin, Brady, Kilpatrick, & Resnick, 1995; Kaukinen & DeMaris, 2005; Kilpatrick, Acierno, Resnick, Saunders, & Best, 1997; Kimerling et al., 2010). Specifically, women seeking treatment for substance use disorders have significantly higher rates of interpersonal trauma than those without such disorders (Miller et al., 1987; Miller & Downs, 1993), with some studies reporting interpersonal trauma rates as high as 80% (Dansky et al., 1995; Kilpatrick, 1990). Similarly, substance users tend to have considerably higher rates of PTSD (Dansky et al., 1995; Grice et al., 1995; Kilpatrick, 1990) than comparison groups. Sampling instead from those with histories of interpersonal trauma, researchers have found a strong association with subsequent abuse of substances (Burnam et al., 1988; Cisler et al., 2012; Kilpatrick et al., 1997; Kimerling et al., 2010; Springs & Friedrich, 1992; Walker et al., 1999; Weaver & Etzel, 2003). In particular, women with severe histories of child maltreatment have higher rates of substance use disorders than women without maltreatment histories (Kendler et al., 2000; Walker et al., 1992). In a large epidemiological study, Burnam et al. (1988) found that those with child and/or adult sexual assault histories were 2.3 times more likely to have an alcohol use disorder and at 2.5 times greater risk of drug abuse or dependence. Kendler and colleagues studied 1411 female twins (mixed monozygotic and dizygotic). They found women with a history of child sexual abuse were 2.6 times more likely to develop substance dependence in adulthood, while those reporting the most severe form of CSA assessed (i.e., involving intercourse) had an increased risk of 6.6 times when compared to their non-abused twin. Findings from this study were particularly strong due to the authors' significant

methodological efforts to control for heritability, family environment, and parental psychopathology through the use of twin pairings as well as parental reports.

Looking further at samples of women with child maltreatment histories, Springs and Friedrich (1992) found that CSA was linked to earlier age of smoking onset and heavier cigarette use in a group of female patients at a family practice clinic. Furthermore, women in this sample who reported histories of sexual abuse in childhood were more likely to endorse a need to decrease their alcohol use and were more likely to report a drug problem, suggesting that CSA is linked to problematic usage across substance categories. In other studies, women with histories of child maltreatment were 1.5 times more likely to endorse problematic alcohol use (Walker et al., 1999), about twice as likely to report having ever had a problem with alcohol or drug abuse (Briere & Runtz, 1987; McCauley et al., 1997), almost 5 times more likely to endorse current use of illicit drugs (McCauley et al., 1997), and 10 times more likely to report a history of drug addiction (Briere & Runtz, 1987) than non-abused participants.

In the Adverse Childhood Experiences (ACE) study (Anda et al., 1999; Felitti et al., 1998), a large sample of adults reported on specific types of adverse experiences during childhood, subsequent risk behaviours, and physical health outcomes. Participants were asked about 8 types of difficult experiences in their childhoods, some of a potentially traumatic nature. These included psychological, physical, and sexual abuse, witnessing violence towards one's mother, as well as experiences that are often considered general "life stressors" or, in this study, "household dysfunction" (i.e., parental divorce, substance abuse, mental illness, or incarceration among individuals in their household). Looking specifically at the impact of these adverse experiences on

smoking behaviours, Anda and colleagues found that respondents who reported any of the adverse experiences were at significantly increased risk of ever smoking and being heavy smokers. Furthermore, as the number of adverse experiences increased, so did the risk for smoking, and particularly, the risk for early age of smoking initiation. For example, those participants endorsing five or more types of adverse experiences during childhood were 5.4 times more likely to begin smoking before the age of 14. A similar pattern was observed for measures of alcoholism and illicit drug use (Felitti et al., 1998). Risk for drug and alcohol use increased in a graded manner as the number of adverse childhood experiences increased. When compared to participants with no adverse experiences in childhood, those with four or more such experiences were 7.4 times more likely to consider themselves an alcoholic, 4.7 times more likely to have ever used illicit drugs, and 10.3 times more likely to have ever taken drugs intravenously. It should be noted that the ACE study did not assess or control for PTSS/PTSD or other trauma-related psychopathology; thus, these findings only address the direct link between adverse experiences (which included interpersonal violence) and health risk behaviours.

Not only have researchers identified a significant risk of substance use in survivors of interpersonal trauma, they have also revealed variable patterns of substance use within survivor groups. This is seen most poignantly with the link between trauma severity and increased risk for substance abuse (e.g., Kendler et al., 2000). In a study of interpersonal trauma among substance users, sexual assault was measured at 3 levels of severity: molestation, attempted rape, and completed rape (Dansky et al., 1995). Results revealed that women in the Heavy Drug use category (e.g., use of cocaine, heroin, amphetamines, etc.) were significantly more likely to have experienced a completed rape,

the most severe form of sexual assault, than those women who were in the Alcohol only group. Similarly, Weaver and Etzel (2003) assessed a sample of female survivors of intimate partner violence (IPV) and discovered that those women who reported more recent and severe violence also scored higher on a measure of nicotine-related physical dependence. These studies offer preliminary indications that more severe forms of interpersonal trauma are linked with more severe forms of substance abuse.

Using multiple victimizations, or revictimization, as a measure of increased severity, several studies have revealed that women experiencing multiple types of victimization and/or repeated victimizations at different points in the lifespan (i.e., childhood and adulthood) are at a markedly greater risk for substance abuse (Anda et al., 1999; Felitti et al., 1998; Hedtke et al., 2008; Kilpatrick et al., 1997; McCauley et al., 1997). In particular, McCauley's research team looked specifically at a subsample of women who had been separately victimized during childhood and adulthood and found these revictimized women were at a significantly greater risk of abusing substances than all other comparison groups (i.e., women with abuse experiences in childhood only, adulthood only, as well as those with no history of abuse). Using data from the National Women's Study, Hedtke and colleagues (2008) revealed that the occurrence of substance use problems was much higher in women who experienced multiple types of violence, and highest when all three forms of violence (i.e., physical assault, sexual assault, and witnessing violence) were present as compared to those who endorsed just one type of violence. With an established link between trauma severity and severity of adverse health outcomes (Friedman & Schnurr, 1995; Koss, Koss, & Woodruff, 1991a; Runtz, 2002; Springs & Friedrich, 1992), the demonstration of a similar dose-response relation

between trauma severity and risk of substance abuse lends support to a model that includes substance use behaviours in the association between interpersonal trauma and adverse health outcomes.

PTSS/PTSD and substance use. In addition to the strong link connecting trauma exposure and substance use, a specific association also exists between posttraumatic stress disorder and symptomatology (PTSD/PTSS) and substance use behaviours. Research linking PTSS/PTSD and substance use is not as extensive as that demonstrating the association between interpersonal trauma and substance use, in part because many of the latter studies simply have not assessed for PTSS/PTSD (e.g., Felitti et al., 1998; McCauley et al., 1997; Springs & Friedrich, 1992). Nevertheless, large epidemiological studies have shown that 27% to 43% of adults with PTSD have comorbid substance abuse or dependence (Breslau et al., 1991; Kessler et al., 1995), indicating that it is not uncommon for these disorders to co-occur in the aftermath of trauma exposure. Moreover, while PTSD is likely to occur both before and after other comorbid disorders, it tends to be the primary diagnosis when comorbid with substance use disorders (Kessler et al., 1995), indicating that in many cases, problematic substance use develops subsequent to posttraumatic stress symptomatology.

In a large U.S. national probability sample of women, Kilpatrick (1990) found that those who had developed PTSD subsequent to experiencing a crime were almost 14 times more likely than non-victims to have an alcohol abuse problem and 22 times more likely to have a problem with drug abuse. A decade later, as part of the National Survey of Adolescents, Kilpatrick and colleagues (2000) determined that PTSD independently heightened adolescents' risk of developing a problem with substances other than alcohol,

even after taking into account the role of demographics, familial substance use problems, and interpersonal trauma experiences. In a replication of the National Women's Study, McCauley and colleagues (2009) found that women with lifetime PTSD were significantly more likely to engage in non-medical use of prescription drugs than those without PTSD. This was not the same for women with a major depressive episode.

Among a smaller, clinical sample of women, Weaver and Etzel (2003) found that female survivors of intimate partner violence with the most severe PTS symptoms also had the highest levels of nicotine-related physical dependence. Looking specifically at individuals in treatment for substance use, Grice and colleagues (1995) diagnosed PTSD in more than half of substance users who had a history of physical or sexual assault while none of the substance users who denied histories of assault met criteria for PTSD. The absence of PTSD in the non-assault group was particularly noteworthy because 75% of this group reported lifetime experiences of non-interpersonal traumas (e.g., natural disaster). Finally, Epstein, Saunders, Kilpatrick, and Resnick (1998) found strong support for a mediation model in which PTSS fully mediated the relation between CSA and alcohol use in a large sample of adult women. Findings from these last two studies suggest there may be a particularly important association between PTSD and problematic substance use in the context of interpersonal trauma.

Regardless of the studied population (i.e., substance users, trauma survivors, women suffering from PTSD, etc.), research reliably shows that substance use disorders occur in the context of interpersonal trauma and PTSD at a much higher rate than what is expected in the general population. There are several theoretical reasons why this relationship might exist. The most commonly cited explanation is the self-medication

hypothesis (Khantzian, 1985), which in the present context is the idea that excessive substance use is a method of self-medicating posttraumatic stress symptoms and other forms of psychological distress experienced in the aftermath of an interpersonal trauma. Specifically, PTSD sufferers may engage in the use of alcohol, tobacco, and other drugs as a method of decreasing or managing specific trauma-related symptoms such as hyperarousal (e.g., sleep disruption) and reexperiencing (e.g., intrusive memories of the trauma) or in order to obtain a state of numbness. Briere refers to this behaviour as "chemically induced dissociation" (1996, p. 30) when discussing adult survivors of child sexual abuse. Because the substance of choice does not, in fact, treat the user's distress and instead provides only temporary relief from PTS symptoms, the pattern of use can quickly become addictive and turn into a pattern of abuse or dependence. Furthermore, substance withdrawal can exacerbate PTSS, leading the sufferer to further increase their level of use (Dansky et al., 1994; Rheingold et al., 2004). In addition, substance use is likely to interfere with healthy psychological coping in the aftermath of a trauma. Consequently, survivors may actually increase their risk for developing PTSD by using substances in place of healthier methods of coping with acute distress (Dansky et al., 1994).

Findings from several studies lend support to the self-medication hypothesis. First, self-medication of posttraumatic stress symptoms is considered more likely if a temporal association exists with trauma and PTSS preceding problematic substance use. With data from the ACE study, Anda and colleagues (1999) were able to demonstrate that sexual abuse preceded, and increased risk for, smoking in a subset of their population. Specifically, individuals who experienced CSA prior to the age of 14 were

four times more likely to begin smoking than those with no reported adverse experiences, and they tended to begin smoking after the abuse occurred.

In order to further examine the temporal relation between PTSS and alcohol use in their sample of adult women, Epstein and colleagues (1998) graphed the age of onset for participants' posttraumatic stress symptoms and indicators of alcohol abuse. In doing this, the authors found within the subgroup of women who endorsed both PTSS and symptoms of alcohol abuse, 65% had an earlier age of onset for PTSS than for alcohol abuse. This was compared to 30% of women who reported earlier age of onset for alcohol abuse and 5% who stated PTS symptoms and alcohol abuse symptoms began around the same time. While this study acknowledges that both directional pathways exist, the majority of relevant women in this large representative sample reported alcohol abuse subsequent to trauma and PTSS.

While both these investigations support a temporal association with trauma and/or PTSS preceding substance use, neither study actually tested that the substance in question was used to alleviate psychological distress. For this we turn to a study by Miranda, Meyerson, Long, Marx, and Simpson (2002), specifically designed as an empirical test of the self-medication hypothesis in sexual assault survivors. Not only did these researchers assess psychological distress and alcohol use (the focal substance in this study) among sexual assault survivors, they also gathered data on the extent to which each participant found alcohol to be negatively reinforcing using the Drug Use Functional Assessment Screening Tool. The authors utilized a specific subscale of this tool that measured how much a respondent used alcohol to cope with distressing symptoms, regardless of the amount of alcohol consumed. They then tested a path model in which psychological

distress was indirectly related to alcohol abuse through the variable representing the extent to which alcohol was used to cope with distress. Their model was a good fit to the data and explained over half of the variance in alcohol use, allowing the authors to conclude that, among sexual assault survivors, psychological distress is associated with alcohol abuse due to the negative reinforcement provided by the alcohol.

Another set of research studies have examined the beliefs or expectancies people have about alcohol use, specifically with respect to PTSD symptoms. Norman, Inaba, Smith, and Brown (2008) adapted a measure called the Alcohol Expectancy Questionnaire (AEQ) to examine participants' beliefs about the impact of alcohol use on their PTS symptoms. In a preliminary investigation using the adapted PTSD-AEQ with war veterans, the authors found that scores on the measure successfully differentiated participants with an alcohol use disorder from those who did not have a problem with alcohol, suggesting that PTSS-specific beliefs about alcohol use may predict the development of an alcohol use disorder.

Vik, Islam-Zwart, and Ruge (2008) extended this research by using the PTSD-AEQ with a sample of sexual assault survivors. They found not only that symptom-specific expectancies mapped well on to the factor structure of PTSD symptom clusters, but also that beliefs about alcohol's ability to ameliorate certain PTSD symptoms was strongly correlated with actual alcohol consumption. Thus, if individuals believe substance use, in this case alcohol consumption, will improve their distressing trauma-related symptoms, they may be more likely to engage in substance use at higher levels. While further evidence will help to clarify and ascertain these behavioural patterns, this preliminary research suggests a promising direction.

In contrast to the self-medication hypothesis, several researchers (e.g., Champion et al., 2004; Cottler, Compton, Mager, Spitznagel, & Janca, 1992) have argued that an opposite directional pathway explains the link between substance use and interpersonal trauma. In particular, it is proposed that lifestyle choices made by substance users increase their risk of trauma exposure. Speaking specifically to the risk of sexual victimization, a number of authors (e.g., Norris, Nurius, & Dimeff, 1996; Nurius, 2000; Testa & Parks, 1996) have commented that substance use can alter a woman's perception of risk in a given situation, can make it difficult to physically defend herself against an attacker, and visible intoxication may increase a woman's likelihood of being targeted for victimization.

Cottler and colleagues (1992) determined, in their analysis of the St. Louis Epidemiologic Catchment Area data, that substance users were 1.8 times more likely to have experienced a traumatic event than nonusers. To support the hypothesis that substance use increases risk for trauma exposure, the authors reported that, in the majority of their respondents, age of first substance use preceded age of onset for PTSD symptoms. However, two flaws in their analyses call this temporal association into question. First, the researchers did not compare the age of onset for substance use to the participant's age at the time of trauma exposure, but rather, to the onset of PTSD symptoms. Second, the authors used a participant's age at first drug use as the point of onset for the substance use component, which may be misleading as age at first drug use may not be an accurate indicator of one's onset of problematic substance use. Therefore, Cottler and her colleagues are only able to conclude that for many participants, their first substance use preceded the onset of their PTSD symptoms. Although compelling, their

findings do not confirm that substance abuse preceded the time of, and thus potentially increased risk for, trauma exposure.

In two samples of female adolescents, Champion et al. (2004) found that a number of risky behaviours, including alcohol and marijuana use, were associated with increased likelihood of experiencing sexual victimization. In their discussion of these findings, the authors suggested that the risky behaviours were precursors to sexual assault experiences. However, because they used cross-sectional data no directional conclusions can be made. Champion and her coauthors address this in their discussion by raising two other potential explanations for their findings: 1) that survivors of adolescent sexual victimization may use substances to self-medicate following the trauma, and 2) that the possibility of a reciprocal relationship may exist. This reciprocal relationship would suggest that victimization increases risk for substance use, which in turn, increases the likelihood of revictimization. Champion et al. could not test this hypothesis in their study as no data on victimizations prior to adolescence had been collected and the study was not of a longitudinal nature.

In 1997, Kilpatrick and colleagues designed a longitudinal study of adult women to test the hypothesis that a reciprocal relationship (i.e., a "vicious cycle") best explains the link between interpersonal trauma and substance abuse. Results from three waves of data collection revealed that the reciprocal pathway provided the best fit to the data on illicit drug use, while a unidirectional pathway from interpersonal trauma to substance abuse was supported for participants who used only alcohol. In other words, illicit drug use at Time 1 increased risk for new physical and sexual assault experiences over the next two years. New assaults, in turn, increased one's risk of subsequent drug use. With

respect to alcohol, interpersonal assaults increased one's post-trauma likelihood of abusing alcohol; however, alcohol abuse did not impact the odds of experiencing a future assault.

Hedtke and her colleagues (2008) also attempted to test the reciprocal relationship between interpersonal trauma and substance use in their longitudinal study. Their results, however, only provided support for the hypothesis that interpersonal trauma leads to increased risk of drug and alcohol abuse. Specifically, they found that both lifetime history of interpersonal violence (prior to Time 1) and new incidents of violence (between Time 1 and Time 3) increase odds of substance use disorders. In contrast to Kilpatrick et al. (1997), past-year substance use did not predict new incidents on interpersonal trauma after lifetime trauma history was controlled.

Because the purpose of the proposed research is to address behavioural mechanisms linking interpersonal trauma and PTSS/PTSD to adverse health outcomes, the self-medicating hypothesis and the associated links among interpersonal trauma, PTSS, and increased risk of substance use is of the most relevance. However, results will be interpreted with the possibility of a reciprocal relationship in mind.

Risky sexual behaviours. Engagement in behaviours such as early onset of sexual activity, risky sexual encounters, and sex with multiple partners can increase the likelihood of developing sexual and reproductive health problems (FTP Advisory Committee, 1999; Reiter, Katz, Ferketich, Riffin, & Paskett, 2009; WHO, 2004). Adverse health outcomes resulting from risky sexual activity include cervical cancer, medical complications of unintended pregnancy, sexually transmitted infections (STIs),

including HIV, as well as long-term complications of STIs such as pelvic inflammatory disease and infertility.

Unfortunately, some of these health problems may be the direct result of the sexual assault experience itself. In fact, approximately 5 to 7% of rapes result in pregnancy (Holmes, Resnick, Kilpatrick, & Best, 1996; Koss, Woodruff, & Koss, 1991b). Similarly, 4 to 30% of rape survivors will contract an STI from the sexual assault (Koss et al., 1991b; Koss & Heslet, 1992). However, many of these health concerns develop long after the sexual assault occurred and are likely the result of subsequent sexual behaviours. Furthermore, some of the same health problems arise in survivors of physical assault or intimate partner violence who have not had sexual trauma experiences (Campbell, 2002; Green et al., 2005).

Looking at investigations of specific patterns of behaviour that increase the likelihood of adverse sexual and reproductive health outcomes, a number of important findings are revealed. For example, Brener, McMahon, Warren, and Douglas (1999) analysed data from the 1995 National College Health Risk Behavior Study and found that undergraduate women who had been raped were more likely to report risky sexual behaviours. This finding held over and above the contribution of several demographic factors (i.e., age, parents' education, ethnicity, sorority membership). Specifically, women who reported a history of rape were more than twice as likely to have had multiple sexual partners in the past 3 months, to have had their first experience of sexual intercourse before age 15, and to have used drugs or alcohol just prior to their last intercourse experience. The authors explain this compilation of results using Resnick and et al.'s (1997) theoretical model of the development of violence-related health problems.

Resnick and colleagues proposed that engagement in health risk behaviours is one pathway through which interpersonal violence impacts physical health outcomes. Specifically with respect to rape survivors, women may use drugs or alcohol in order to manage anxiety and distress triggered by the prospect of new sexual experiences. Intoxication may then impair a woman's ability to practice safe sex. Brener and colleagues (1999) also proposed that trauma-related mental health problems such as PTSD may create feelings of powerlessness and low self-worth which cause a woman to engage in risk-taking behaviours as a form of self-destruction. In addition, the authors comment that because they did not specifically assess for participants' first *consensual* intercourse, the woman's actual age at the time of an incident of sexual abuse may, in part, account for the reported early age of onset of sexual intercourse.

Two of the most frequently investigated indicators of risky sexual behaviour are age of first intercourse and number of sexual partners. Many studies in addition to Brener et al. (1999) have found that interpersonal trauma, and particularly sexual trauma, is linked with earlier onset of sexual activity and a greater number of sexual partners. For example, Silverman, Raj, Mucci, and Hathaway (2001) assessed two large samples of female high school students and found that those who had experienced physical and/or sexual dating violence were 2.4 to 8.2 times more likely to have an onset of sexual intercourse before the age of 15. These women were also 2.2 to 6.3 times more likely to have three or more sexual partners in the 3 months prior to the study. In a slightly older sample of undergraduate women, similar findings were reported (Gidycz, Orchowaski, Kings, & Rich, 2008). Specifically, women who had sexual assault experiences of moderate severity (i.e., unwanted sexual contact, sexual coercion, or attempted rape)

were 3.3 times more likely to have had sex before the age of 16 than women with no assault history. Women with histories of severe sexual assault were 4.6 times more likely to have early onset of sexual intercourse and 4.5 times more likely to have multiple sexual partners in the past 3 months than non-assaulted women. Finally, Lechner, Vogel, Garcia-Shelton, Leichter, and Steibel (1993) determined in their sample of female primary care patients that a participant's age at first sexual intercourse significantly discriminated between sexual abuse survivors and participants with no abuse history.

Additional health risk behaviours have been examined in a few studies. For example, Walker and colleagues (1999) found that, among a large sample of female health care patients, women with histories of child maltreatment were more likely to have sex without knowing their partner's sexual history. Similarly, in a sample of university women, Van Bruggen, Runtz, and Kadlec (2006) found that a history of childhood psychological maltreatment was associated with the number of different partners a woman had sex with on a single occasion (i.e., a "one night stand"). In a unique study with almost 3500 Grade 8 and Grade 10 students in Alabama, Nagy, Adcock and Nagy (1994) determined that girls who had sexual abuse histories reported risky attitudes towards sex (e.g., that it is alright to have sex with multiple partners) and higher rates of pregnancy than both sexually active teens with no abuse histories and non-abused girls who were not sexually active. Finally, Bauer and colleagues (2002) found that a history of intimate partner violence was associated with substance use before intercourse in a sample of women seeking health care at an STD clinic.

Similar to the relation between interpersonal trauma and substance use, some researchers have found that the magnitude of risky behaviours increases with the severity

of the trauma. Using both penetration and multiple abuse incidents with different perpetrators as indictors of sexual abuse severity, Springs and Friedrich (1992) found that more severe histories of CSA were associated with earlier age of onset for first intercourse. Similarly, Felitti and colleagues (1998) used multiple adverse experiences as an indicator of severity in the ACE study and determined that having 50 or more sexual partners in one's lifetime was significantly more common in those participants who had reported four or more adverse experiences in childhood (i.e., four or more of the following: psychological, physical, and sexual abuse, witnessing violence towards one's mother, parental divorce, parental substance abuse, parent mental health problems, or incarceration of a close family member). In Green et al.'s (2005) study, the investigators categorized participants based on trauma characteristics and severity. The specific categories included No Trauma, Traumatic Loss, Physical Assault (single incident), Sexual Assault (single incident), Multiple Single Events, and Abuse (5 or more assault experiences in one year). While the authors did not rank each of the trauma groups in order of relative severity, they did state a priori that they believed the Abuse group represented the greatest severity and thus would be associated with more risky behaviours than other groups. This hypothesis was supported by the data with the Abuse group reporting significantly higher rates of several assessed risky behaviours, including number of lifetime sexual partners, number of incidents of sex with a partner at their first meeting, as well as rates of pregnancy, abortion, and STIs.

Finally, the association between PTSS/PTSD and risky sexual behaviours was only assessed in one of the studies reviewed. Specifically, Green and colleagues (2005) found that PTSD diagnostic status was associated with higher levels of dysfunctional

sexual behaviours, as assessed by the Trauma Symptom Inventory (TSI). The specific subscale from the TSI that was related to PTSD includes items such as "having sex with someone you hardly knew." Authors acknowledge that their findings are preliminary and the relation between PTSD and risky sexual behaviours should be further explored in future studies.

Proposed Research Study

The present research study investigated links among interpersonal trauma, posttraumatic stress severity (PTSS), health risk behaviours, and adverse health outcomes. The primary goal of this research was to examine the roles of specific behavioural mechanisms, both as potential methods of coping with distress in the aftermath of interpersonal trauma and as a pathway through which PTSS may contribute to poorer physical health.

With PTSS/PTSD as an established mediator of adverse health outcomes in trauma survivors (Schnurr & Green, 2004), the next investigative step was to examine the mechanisms through which these pathways might operate. Looking specifically at the role of health risk behaviours in the association between PTSS/PTSD and health was important for a number of reasons. First, substance use/abuse and risky sexual behaviours are disproportionately seen among women in the aftermath of interpersonal trauma (Gidycz et al., 2008; Kilpatrick et al., 1997; Lechner et al., 1993; Rodgers et al., 2005; Springs & Friedrich, 1992; Wadsworth & Records, 2013). Considerable evidence links substance use to PTSS/PTSD (Dansky et al., 1995; Grice et al., 1995); while risky sexual behaviours have more often been examined in relation to trauma exposure rather than subsequent posttraumatic stress (e.g., Brener et al., 1999; Messman-Moore et al.,

2010). Because of this, associations involving trauma and risky sexual behaviours need to be more extensively examined while also assessing for PTSS/PTSD. Similarly, existing research has tended to look at individual health risk behaviours in isolation (e.g., alcohol use alone, or only the number of lifetime sexual partners). It is preferable to assess for a range of health risk behaviours, including several indicators of risky sexual behaviour, multiple forms of substance use, and associated problems or indications of abuse or dependence. Finally, health risk behaviours have often been considered the outcome measure in this field of research, without actually examining whether these behaviours account for poorer physical health. Thus, the present study extended this model to include an additional pathway from health risk behaviours to physical health problems, allowing for these associations to be more fully examined.

While a considerable body of research has looked at different components of the proposed study separately, these variables and relations have not been examined together in comprehensive models with an inclusive sample of female interpersonal trauma survivors (i.e., including multiple forms of interpersonal trauma experienced at different points in the lifespan). See Figures 1 and 2 for visual displays of the hypothesized pathways. In summary, the proposed study will examine the following hypotheses and research questions:

Hypotheses.

1. Interpersonal trauma will be associated with poorer physical health outcomes, specifically consisting of more general health symptoms, more sexual and reproductive health symptoms, worse perceived health, and greater health-related functional impairment.

2. Interpersonal trauma severity will be positively associated with PTSS severity.
3. Interpersonal trauma will be indirectly associated with adverse health outcomes through PTSS severity.
4. Severity of interpersonal trauma history will be positively associated with rates of substance use and associated problem behaviours.
5. Interpersonal trauma severity will be associated with increased engagement in risky sexual behaviours.
6. Interpersonal trauma will be indirectly associated with substance use through PTSS severity.
7. Interpersonal trauma will be indirectly associated with risky sexual behaviours through PTSS severity.
8. PTSS severity will be indirectly associated with adverse health outcomes through substance use.
9. PTSS severity will be indirectly associated with adverse health outcomes through risky sexual behaviours.
10. The hypothesized structural equation models, combining each of these proposed associations, will be supported by the data.

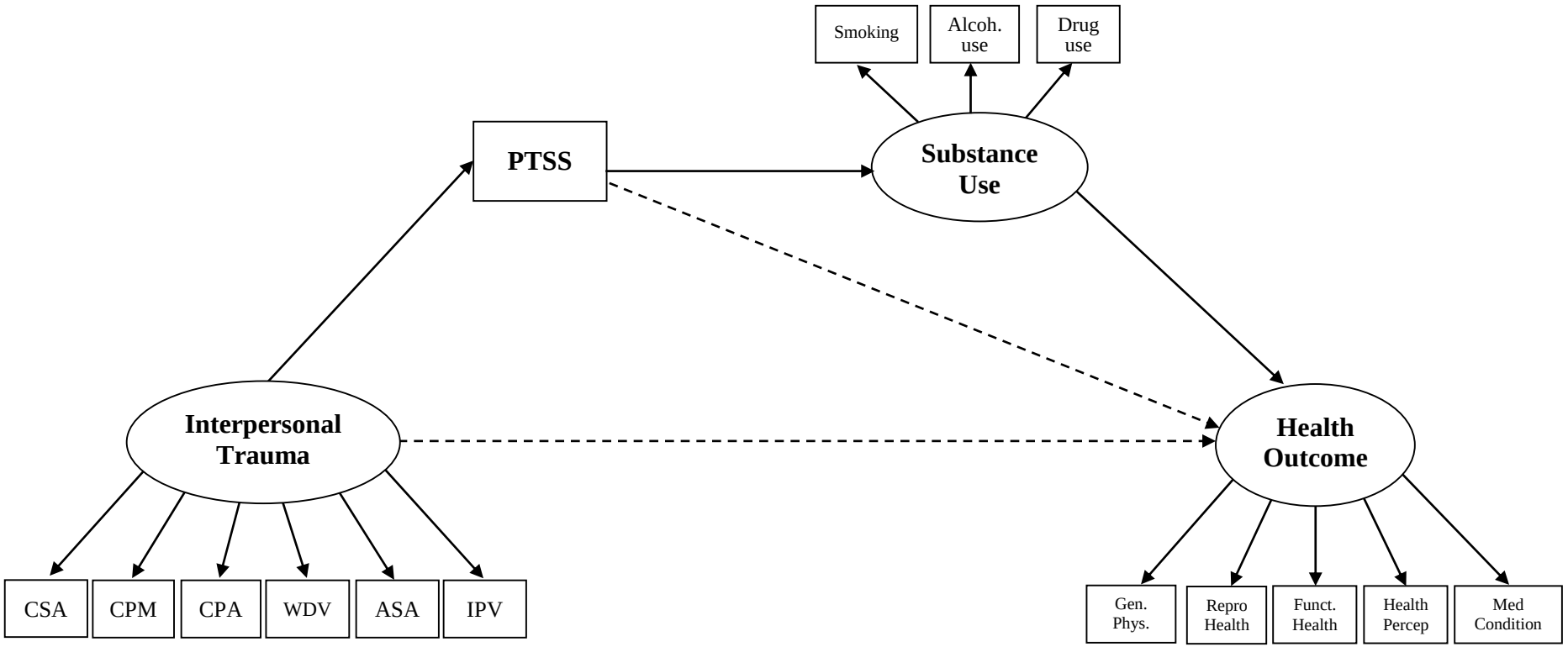

Figure 1. Hypothesized model involving substance use.
Note. CSA = child sexual abuse; CPM = child psychological maltreatment; CPA = child physical abuse; WDV = witnessing domestic violence; ASA = adult sexual assault; IPV = intimate partner violence; PTSS = posttraumatic stress symptom severity; Alcoh. use = alcohol use; Gen. Phys. Sx = general physical health symptoms; Repro Health = sexual and reproductive health symptoms; Funct. Health = health-related functional impairment; Health Percep = global health perceptions; Med. Conditions = physician diagnosed medical conditions.

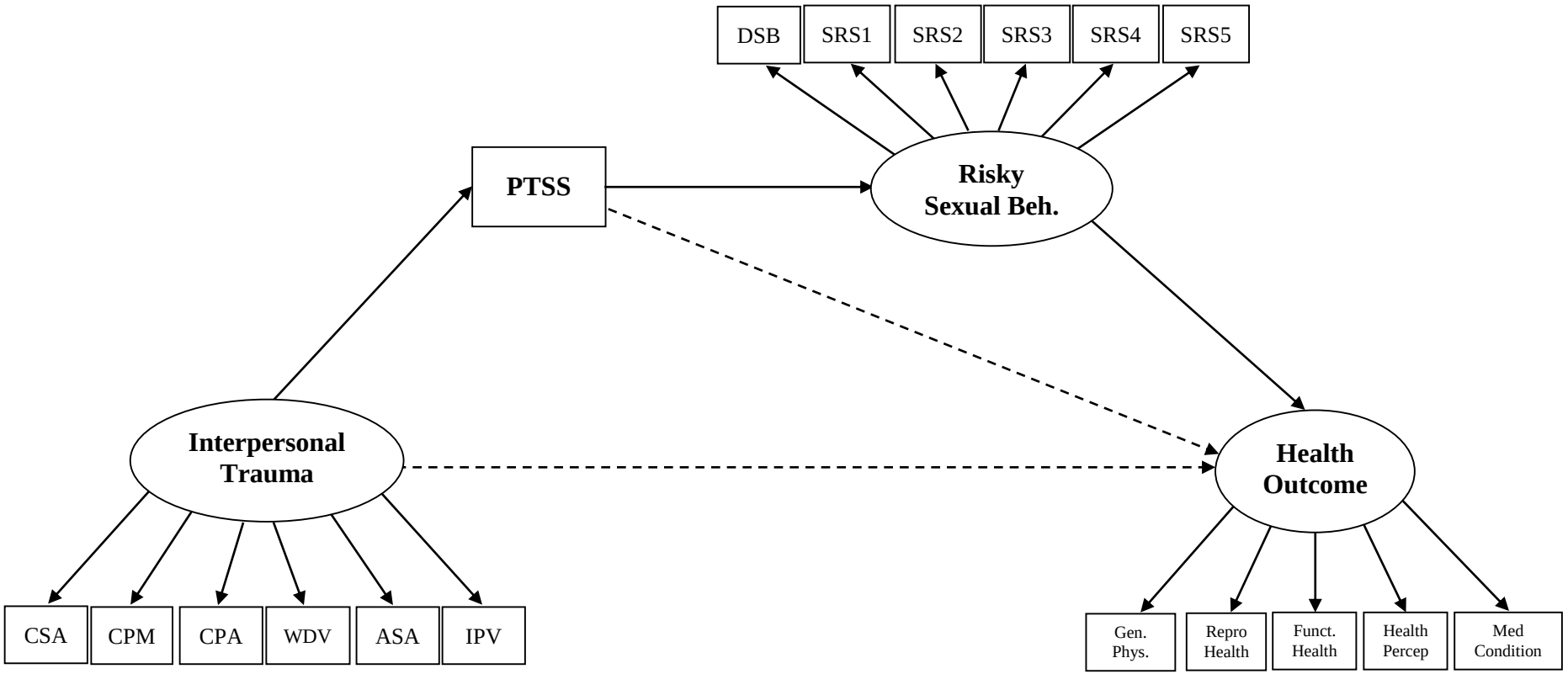

Figure 2. Hypothesized model involving risky sexual behaviours (RSBs).
Note. CSA = child sexual abuse; CPM = child psychological maltreatment; CPA = child physical abuse; WDV = witnessing domestic violence; ASA = adult sexual assault; IPV = intimate partner violence; PTSS = posttraumatic stress symptom severity; DSB = Dysfunctional Sexual Behaviour subscale score from the TSI-2; SRS1 = Sex with Uncommitted subscale of the SRS; SRS2 = Risky Sex Acts subscale of the SRS; SRS3 = Impulsive Sexual Behaviours subscale of the SRS; SRS4 = Intent to Engage subscale of the SRS; SRS5 = Risky Anal Sex Acts subscale of the SRS; Gen. Phys. Sx = general physical health symptoms; Repro Health = sexual and reproductive health symptoms; Funct. Health = health-related functional impairment; Health Percep = global health perceptions; Med. Conditions = physician diagnosed medical conditions.

Method

Participants and Procedures

The sample for this study was comprised of the female subset of a larger dataset of male and female participants recruited from the student population at the University of Victoria (UVic) between October 2011 and December 2012. Undergraduate students enrolled in the Introductory Psychology course at UVic were able to voluntarily sign up for a participation time slot through an online, computerized system called Sona Systems (http://uvic.sona-systems.com). In order to be eligible, participants were required to be 19 years of age or older and to be fluent in English. The larger study, entitled Life Experiences, Health, and Relationships (LEHR; Runtz & Eadie, 2013), was described as involving "the completion of a questionnaire about participants' psychological, physical, and sexual health, and experiences across the lifespan." In exchange for their participation, students received bonus credit toward their course grade.

The questionnaire was administered to participants electronically, using the LimeSurvey application (v. 1.87+), in a computer lab on the UVic campus with a researcher present. Before administration of the survey, participants reviewed an Informed Consent letter (see Appendix A) which outlined that questions address topics of a sensitive and personal nature, and they were free to discontinue the study at any time. They were also permitted to choose a "No Answer" option on all forced choice questions instead of providing a specific response, if they did not feel comfortable answering the question. Contact information for the researchers as well as a list of appropriate crisis and psychological services were provided at the end of the consent form. Participants had to affirm their consent by selecting the appropriate field before they could continue

with the questionnaire. Appropriate precautions were taken to maintain confidentiality of participant responses (e.g., leaving an empty computer station between each participant). At the conclusion of the questionnaire, participants were able to view and print a study debriefing form (Appendix B), or pick up a copy from the study administrator, which thanked them for participating and provided information about the purpose of the study. In almost all cases, the full questionnaire was completed in one session. In a small number of cases, participants did not complete the questionnaire in the allotted time. The LimeSurvey application included the option for participants to email themselves a weblink to their partially complete questionnaire for completion at a later time. This option was utilized in a few cases and participants were instructed to complete the questionnaire in a private, secure location within the next day or two. Only one participant in the present sample completed the questionnaire in two sittings, with the full questionnaire completed by the following day. Other participants who used the email survey option were either male, or did not complete the remaining portion of the questionnaire and were deleted from the analyses.

Sample characteristics. Out of 571 women who began the study, a total of 555 women completed the questionnaire, resulting in a completion rate of 97.2%. Nevertheless, an additional 80 participants had excessive missing data on their questionnaires, and consequently these cases were omitted prior to analyses; see Results section for detailed discussion of missing data procedures. This resulted in a final sample of 475 women; 83.2% of the originally recruited sample. Participants' ages ranged from 17 to 46 with a mean of 21.2 years old (SD = 3.41; Mdn = 20.0). The majority of participants identified as Caucasian (n = 323; 68%), with the next largest group

identifying their ethnicity as Asian (*n* = 73; 15%). Additional ethnic groups are presented in Table 1 along with other demographic details. Most women reported their primary language as English (*n* = 431; 91%) and Canada as their country of origin (*n* = 378; 80%). Over half of the sample (*n* = 253; 53%) stated they were currently in a relationship, and 95% (*n* = 446) of participants self-identified as heterosexual.

The median personal income for this sample was reported to be less than $10 000 CAD per year. However, because this is a relatively young, student sample, a measure of family income at the age of 17 was also requested and may provide additional information about their level of income support. Median family income was reported to be $90 000-$99 999 per year with almost half of the sample (49.5%) coming from families that made $80 000 or more. Similarly, the median category for highest level of education among participants' parents was a completed college or university degree, while 185 (39%) respondents indicated at least one of their parents had completed a Master's, doctoral, or professional degree. The majority of participants themselves (*n* = 432; 91%) had completed at least some courses at the undergraduate level.

Demographics. As outlined above, participants were asked a series of demographic questions listed in Appendix C. Results are outlined in Table 1.

Table 1

Demographic Characteristics of Participants

Variable	*N*	*n*	*%*
Ethnicity	475		
Asian		73	15.4
African-Canadian		3	0.6
Caucasian		323	68.0
Hispanic		10	2.1
Other		10	2.1
Mixed		56	11.8
Primary Language	473		
English		431	91.1
French		7	1.5
Spanish		8	1.7
Asian Languages (e.g., Mandarin)		24	5.1
Other		3	0.6
Sexual Orientation	469		
Heterosexual		446	95.1
Bisexual		19	4.1
Lesbian or Gay		4	0.9
Personal Annual Income	475		
Less than $10 000		300	63.2
$10 000 to $19 999		85	17.9
$20 000 to $29 999		16	3.4
$30 000 to $39 999		7	1.5
$40 000 to $49 999		3	0.6
$50 000 or more		7	1.5
No answer		57	
Highest Level of Education	475		
Some high school		6	1.3
Completed high school		35	7.4
Trade school		2	0.4
Some college/university		406	85.5
Undergraduate degree		24	5.1
Master’s degree or higher		2	0.4

Table continues…

Variable	*N*	*n*	*%*
Family-of-Origin Annual Income	475		
Less than $10 000		9	1.9
$10 000 to $19 999		9	1.9
$20 000 to $29 999		13	2.7
$30 000 to $39 999		18	3.8
$40 000 to $49 999		31	6.5
$50 000 to $59 999		39	8.2
$60 000 to $69 999		32	6.7
$70 000 to $79 999		37	7.8
$80 000 to $89 999		43	9.1
$90 000 to $99 999		26	5.5
$100 000 or more		166	34.9
Not applicable		52	10.9
Parents' Highest Level of Education	475		
Some high school		17	3.6
Completed high school		34	7.2
Trade school		59	12.4
Some college/university		48	10.1
Undergraduate degree		132	27.8
Master's degree		117	24.6
Doctoral degree		31	6.5
Other professional degree (e.g., L.L.B)		37	7.8

Measures

This study was conducted as part of the larger Life Experiences, Health, and Relationships (LEHR) study (Runtz & Eadie, 2013). The measures listed below are those that are relevant to the present investigation. Additional measures of attachment, relationship characteristics and functioning, as well as several psychological variables were also included in the complete questionnaire, but are not part of the current study.

Interpersonal victimization variables.

Child psychological maltreatment (CPM) and child neglect (CN).

Psychological Maltreatment Review (PMR; Briere, 2006). This 30-item scale was used to assess retrospective accounts of child psychological abuse, neglect, and parental support prior to age 18, measured separately for maternal and paternal figures (see Appendix E). The items are divided into three subscales consisting of 10 items each. These include: Psychological Abuse (e.g., "insulted you"), Psychological Neglect (e.g., "didn't take care of you when they should have"), and Psychological Support (e.g., "said they loved you"). Due to a focus on interpersonal trauma and abuse, only the Psychological Abuse and Neglect subscales are used in the present study. Participants responded on a scale ranging from 0 (never) to 6 (over 20 times a year). Separate ratings for maternal and paternal figures were averaged to create a single subscale score for each participant. Descriptive statistics for these scales as well as the other measures listed below are presented in Table 2. All three subscales have shown very good internal consistency ($\alpha \geq .89$) and the structural validity of the PMR was supported by both exploratory and confirmatory factor analyses (Briere, Godbout, & Runtz, 2012). Cronbach's alphas in the current sample were .94 and .95 for Psychological Abuse and Psychological Neglect, respectively.

Table 2

Mean Scores, Standard Deviations, and Observed Score Ranges for Each of the Continuous Variables of Interest

Variable (Measure)	*M*	*SD*	Range
Child Psychological Abuse (PMR)	26.35	22.64	0-110
Child Neglect (PMR)	20.05	24.08	0-114
Child Physical Abuse (FVSQ)	.83	1.95	0-14
Witnessing Domestic Violence (FVSQ)	2.70	3.87	0-23
Intimate Partner Violence (FVSQ)	2.07	11.0	0-27
Number of Sexual Trauma Incidents	8.67	23.33	0-280
In childhood (CSA)	1.46	10.67	0-200
In adolescence or adulthood (SES)	7.22	19.51	0-280
PTSS Severity (PCL-C)	37.33	15.50	17-85
Problems with Alcohol Use (AUDIT)	7.63	5.17	0-28
Problems with Drug Use (DAST10)	1.26	1.43	0-8
Dysfunctional Sexual Behaviour (TSI2-DSB)	2.30	2.8	0-15
Sexual Risk Taking (SRS)	38.16	24.95	0-130
General Health Symptoms (HSC)	22.51	17.69	0-111
Sexual/Reproductive Health Symptoms (RHQ)	35.55	7.26	25-79
Functional Impairment Symptoms (FIS)	4.62	5.73	0-28
Health Perceptions (Cantril Ladder)	8.31	.93	1-10

Child physical abuse (CPA), witnessing domestic violence (WDV) and intimate partner violence (IPV).

Family Violence Screening Questionnaire. This screening questionnaire consists of two items assessing physical abuse in childhood (i.e., being physically hit or having one's life threatened when under 18 years of age), two items assessing childhood exposure to domestic violence (i.e., verbal and physical aggression between parental figures), and three items to assess intimate partner violence (i.e., verbal aggression, physical aggression, and threats to their life) in their own adolescent and adult relationships. See Appendix F for specific items. Similar to the PMR, participants

responded separately to CPA and WDV items for maternal and paternal figures, providing a frequency rating for a typical year on a scale ranging from 0 (never) to 6 (over 20 times a year).

The items assessing CPA and two of the IPV items were modified from an abuse screening instrument developed by Leserman, Drossman, and Li (1995) which was reported to have acceptable convergent validity, sensitivity, specificity, and test-retest reliability in a sample of women recruited from a health care clinic. One additional IPV item was added to assess for psychological maltreatment within romantic relationships [i.e., "…was verbally aggressive with you (shouting, insulting, etc.)]. Participants responded to IPV items using the same frequency scale as the rest of the questionnaire (i.e., ranging from 'never' to 'over 20 times a year') for two time periods: "in the past year" and "more than a year ago." The two items that ask about witnessing of parental domestic violence were written for a previous study conducted by the same research group, which demonstrated significant associations between WDV and both psychological and physical health outcomes (Godbout & Runtz, 2009).

Items from each separate content area (i.e., CPA, WDV, and adult IPV) were summed to provide a total continuous score for each form of interpersonal violence. For CPA and WDV, scores were collapsed across parental figures by taking the mean of the separate scores for maternal and paternal figures. For IPV, a lifetime rating (i.e., since they began dating) was achieved by summing the scores for the past year and prior. Possible scores ranged from 0 to 12 for CPA and WDV and from 0 to 18 for adult IPV.

Child sexual abuse (CSA). A modified version of a sexual victimization screening measure, developed by Leserman, Drossman, and Li (1995), was used to assess

unwanted sexual experiences. Specifically, four of the five Leserman et al. items, which were originally based on interview questions in a Canadian national population survey (Badgley et al., 1984), were retained. Leserman and colleagues identified the original wording of the fifth item, "has anyone ever forced you to have sex when you did not want this?" as a weakness of this measure. They suggested that reliability of the scale may be increased by greater specification of the term "sex." Subsequently, this item was separated into two items, one asking about oral sex and a second asking specifically about vaginal or anal intercourse. See Appendix D for specific item wording. Participants were asked to retrospectively self-report, in a yes/no format, whether they experienced any of six non-consensual sexual behaviours (e.g., unwanted sexual touching, forced intercourse) before 14 years of age. Specific advantages of this measure are that it uses multiple behaviourally-specific questions as recommended by Koss (1993) and Stoltenborgh, van IJzendoorn, Euser, and Bakermans-Kranenburg (2011) and that items explicitly ask about experiences that the participant "did not want," addressing the issue of consent that is not always present in measures of child sexual abuse. Additional questions about the participant's age at the time of the abuse experiences, the gender and age of the perpetrator, the relationship of the perpetrator to the participant, the use of physical force, and the number of sexual abuse incidents were also included.

The CSA measure was scored in the following ways. First, two methods of categorical scoring were used to create dichotomous variables (0 = no, 1 = yes), primarily for the purpose of calculating prevalence rates of CSA experiences: 1) participants who endorsed any of the CSA items, including threats of CSA and exposure of genitals, were categorized has having experienced *any form of CSA*; 2) participants who reported sexual

touching, oral sex, or intercourse were categorized as experiencing *contact CSA* only. Next, a dimensional scoring method was used to capture varying levels of CSA severity. Participants with no CSA history were scored as 0; those endorsing items 1 or 2 were considered to have experienced "non contact CSA," and received a score of 1; endorsement of items 3 or 4 were labelled as "unwanted contact" and scored as 2; and those who endorsed items 5 or 6 experienced forced penetration and were consequently given the highest severity rating of 3. This resulted in a measure of *CSA severity* ranging from 0 to 3.

In Leserman and colleagues' validation study (1995), they reported adequate sensitivity (71% of those disclosing sexual abuse in an interview also did so on the questionnaire) and specificity (91% of those who denied sexual abuse during interview also indicated no CSA on the questionnaire), summarized as 81% overall agreement between their measure and assessment of sexual abuse history through semi-structured interview. Test-retest reliability across several months was $r = .81$. Internal consistency reliability in a previous study was .88 (Eadie, Runtz, & Godbout, 2008). In the current sample, Cronbach's alpha, calculated using all six items, was .82.

Adolescent/adult sexual assault (ASA).

Sexual Experiences Survey: Short Form Victimization (SES; Koss et al., 2006). This self-report tool is a revised and updated version of Koss and Oros's (1982) original Sexual Experiences Survey. The SES was used to assess unwanted sexual experiences that occurred from age 14 to the present. The survey asks about 7 behaviourally defined items (e.g., "someone had oral sex with me or made me have oral sex with them without my consent by…"), each occurring under 5 different conditions (e.g., "…by threatening

to physically harm me or someone close to me"). See Appendix G for specific items. For each condition, the participant is asked to report how many times this has occurred in the past 12 months (0, 1, 2, 3+) and how many times since the age of 14 until one year ago (0, 1, 2, 3+).

The SES is a widely used instrument for assessing sexual aggression and victimization. Its use of behaviourally-based items and a dimensional conceptualization allows for increased accuracy in identifying the presence of unwanted sexual experiences, particularly over more traditional, categorical methods of assessing sexual assault. Revisions to the original SES include better behavioural specificity, updated wording for the assessment of consent, alcohol and drug related experiences, and coercive tactics, and conversion to gender neutrality. These are outlined in detail by Koss and colleagues (2007).

The structure of this measure allows for both categorical and dimensional scoring with sexual victimization experiences ranging in severity along the following 6-point continuum: no victimization (0), unwanted sexual contact, attempted coerced sex, coerced sex, attempted rape, and rape (6). Dimensional scoring was used in the present study for correlation, regression, and structural equation analyses, and was based upon the most severe experience a participant endorsed. For example, if a given respondent endorsed both unwanted sexual contact and attempted rape, on a dimensional variable they would be assigned the score for their most severe experience: attempted rape. This resulted in a single variable for each participant named, *ASA severity*, ranging from 0 to 6. This scoring method is recommended by the authors of the revised SES (Koss et al., 2006) and the same or similar scoring methods are commonly used in the literature (e.g.,

Edwards et al., 2009; Tansill, Edwards, Kearns, Gidycz, & Calhoun, 2012; Ullman, Karabatsos, & Koss, 1999; ZinZow & Thompson, 2011). Categorical scoring was used for the reporting of descriptive statistics (i.e., the prevalence of each experience).

Koss and colleagues (2007) report the internal consistency of the revised SES to be in the low .70s, and explain this is likely because the SES is better represented by an induced measurement model than a latent one. Internal consistency, which is based on a latent or factor model of measurement, assumes a unidimensional construct where scale items are necessarily interrelated, whereas an induced model does not require inter-item correlations. Koss et al. argue that sexual victimization, as measured by the SES, is not a unidimensional construct, particularly because it is unlikely that a single underlying reason would reliably explain two or more experiences of sexual victimization (i.e., scores on separate items). Accordingly, if the SES items are not necessarily correlated with each other, measures of internal reliability may not be appropriate. Nevertheless, in the present sample, internal consistencies were high: α = .98 for all item responses; α = .97 for experiences reported in the last year; and α = .96 for those reported prior to the past year. These values are similar to those reported in a recent sample of female undergraduate students completing an anonymous online survey (Johnson & Johnson, 2013), whereas the reliabilities reported in Koss et al. encompass a wide range of diverse samples and methods of data collection.

Psychological variables.

Posttraumatic stress symptoms.

PTSD Checklist, Civilian Version (PCL-C; Weathers, Litz, Herman, Huska, & Keane, 1993). The PCL-C is a self-report assessment of posttraumatic stress symptoms

based on the *DSM-IV-TR* criteria for PTSD. Items from each of the three symptoms clusters are assessed: *reexperiencing symptoms* (e.g., "repeated, disturbing dreams of a stressful experience"), *avoidance and numbing symptoms* (e.g., "avoiding activities or situations because they reminded you of a stressful experience"), and *hyperarousal symptoms* (e.g., "feeling jumpy or easily startled"; see Appendix H). Participants respond to each item on a 5-point scale ranging from 1 (not at all) to 5 (extremely) indicating how much they were bothered by a particular symptom at two time periods: 'in the last month' and 'ever'. An additional statement instructed participants to respond to PCL items based on the "most upsetting" of the previously measured interpersonal traumas they endorsed. If participants have not experienced any interpersonal traumas, they were instructed to move on to the next set of questions.

In the original validation study with a sample of combat veterans, the PCL demonstrated excellent test-retest reliability of $r = .96$, internal consistencies ranging from .92 to .93 for separate symptom clusters, and .97 for the overall scale. The PCL also shows good diagnostic performance with a sensitivity of 82% and specificity of 83%, as well as strong convergent validity with other recognized measures of posttraumatic stress (Weathers et al., 1993). In addition, Ruggiero, Del Ben, Scotti, and Rabalais (2003) found evidence that the PCL-C has excellent reliability and validity in a sample of college students. In the present study, the total PCL-C Symptom Severity scale demonstrated an internal consistency reliability of .94 for the past month and .95 for lifetime ratings. Reliabilities for separate symptom clusters ranged from .85 to .91.

Health risk behaviours.

Alcohol use.

Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, De La Fuente, & Grant, 1993). The AUDIT was used to assess level of alcohol consumption and alcohol-related problems. This 10-item screening questionnaire is widely used and well-validated within the substance use literature (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001; Saunders et al., 1993). Respondents indicate the frequency of 10 experiences over the past year. Specific response categories vary (see Appendix I for details); although participants respond to most items on a scale from 'never' (0) to 'daily' (4). The AUDIT consists of three questions on alcohol consumption, three items on drinking behaviours, and four questions on alcohol-related consequences. A particular advantage of the AUDIT is that it is designed to detect milder forms of problematic drinking as well as more severe dependence. Furthermore, the AUDIT is often used for early detection of harmful alcohol use in primary health care settings and in health-related research (see Babor et al., 2001 for guidelines for such use).

Total AUDIT scores fall along a continuous scale which resulted in a severity measure for the present study. Reliability studies demonstrate good internal consistency (e.g., .85; Barry & Fleming, 1993) and test-retest reliability (r = .86; Babor et al., 2001). Internal consistency reliability in the present sample was .82. In addition, a total score of 8 or more is typically used to indicate harmful alcohol use, demonstrating good sensitivity and specificity across a variety of samples (see Fiellin, Reid, & O'Connor, 2000 for a review of validation studies; Saunders et al., 1993).

Cigarette smoking.

Fagerström Test for Nicotine Dependence – modified (FTND; Heatherton, Kozlowski, Frecker, & Fagerström, 1991). This 6-item test was used to measure level of cigarette smoking and associated smoking behaviours (e.g., "how soon after you wake up do you smoke your first cigarette?") for current smokers. Response options vary based on the format of the item. Item 7 inquires about number of cigarettes smoked per day. An additional question was included to gather information about the duration of time the participant has smoked at this level. Total possible scores range from 0 to 10 with higher scores indicating a greater level of nicotine dependence. Researchers have reported good test-retest reliability (r = .85 for 7 month retest) and adequate internal consistency reliability (α = .70; Etter, Vu Duc, & Perneger, 1999). The authors of the FTND report that total scores are closely correlated with biochemical indices of smoking level including salivary levels of nicotine and cotinine and respiratory carbon monoxide levels (Heatherton et al., 1991).

Preceding the original items of the FTND, three additional questions developed for use in this study, established whether the participant is a current smoker, whether they smoked in the past and, if so, the characteristics of their past smoking behaviour (i.e., how long ago they quit smoking, at what frequency they smoked, and how long they were a regular smoker for). See Appendix J for details.

Other drug use.

Drug Abuse Screening Test – 10, modified (DAST-10; Cocco & Carey, 1998). The DAST-10 is a brief screening measure used to assess illicit drug use and nonmedical use of prescription drugs. Participants respond either 'yes' or 'no' to 10 questions about

drug use and drug-related consequences. A score of '1' is assigned to each endorsed item, providing a total score ranging from 0 to 10. The standard threshold indicating problematic use is a score of 3 or above (Cocco & Carey). The original measure only asks participants to report their responses over the past year. For the purposes of this study, we also asked separately for lifetime (i.e., "ever") responses to each item. An additional modification to the measure included questions about the frequency of drug use across 12 types of drugs and nonmedical use of prescription medications during the same two time frames: the past year, and ever. See Appendix K for specific items.

The DAST-10 is the shortest version of this instrument, but is reported to have similar psychometric properties as longer versions of the measure. Cocco and Carey (1998) demonstrated good internal consistency reliability ($\alpha = .85$) and adequate test-retest reliability ($r = .70$) for the DAST-10. In the present sample, alphas were .71 for the past year and .74 for lifetime responses. The DAST-10 has also been shown to perform well with undergraduate populations (McCabe, Boyd, Cranford, Morales, & Slayden, 2006). The drug frequency items had an internal consistency reliability of .78.

Risky sexual behaviours.

Dysfunctional Sexual Behavior (DSB) Subscale of the Trauma Symptom Inventory – 2 (TSI-2; Briere, 2011). This 5-item subscale of the Sexual Disturbance scale from the recently revised TSI-2 measures problematic and impulsive sexual behaviours such as "having sex with someone you hardly knew" and "getting in trouble because of sex." Similar to other items on the TSI-2, participants stated how frequently they engage in these behaviours on a 4-point scale ranging from 0 (never) to 3 (often) over the past 6 months; see Appendix L. The DSB subscale shows good internal consistency reliability

(α = .83) and test-retest reliability (*r* = .83), an average item-total correlation of .78, and a high correlation with the DSB Scale (4 items) on the original TSI (*r* = .83). In the present sample, the internal consistency was .79.

Sexual Risk Survey (SRS; Turchik & Garske, 2009). The SRS is a comprehensive measure of sexual risk taking designed for use with college and university students. Participants responded to 23 items, rating how many times a specific behaviour has occurred in the past 6 months and ever. Only ratings for the past 6 months were used in the present study. Items include: "How many times have you had sex with someone you don't know well or just met?" and "How many times have you had vaginal intercourse without protection against pregnancy?" See Appendix M for a full list of items. Responses were scored from 0 to 4 based on Turchik's standardization using a diverse multi-university U.S. sample (see Turchik, Walsh, & Marcus, 2013 for description of standardization process). Of note, the data from the present sample will be incorporated into an international validation of this measure, which is not yet complete. Through consultation with the scale's author (J. Turchik, personal communication, March 2013), it was determined that the data distribution in the present sample was similar to that of the U.S. standardization sample, and consequently the same coding structure was used.

The SRS has 5 subscales: Sexual Risk Taking with Uncommitted Partners (8 items), Risky Sex Acts (5 items), Impulsive Sexual Behaviours (5 items), Intent to Engage in Risky Sexual Behaviour (2 items), and Risky Anal Sex Acts (3 items). The scale is reported to have good internal consistency (α = .90; Turchik et al., 2013) and test-retest reliability (*r* = .93; Turchik & Garske, 2009). In the present sample, the alpha was .93 for the overall scale and ranged from .75 to .90 for the subscales.

Adverse health outcomes.

General health symptoms.

Health Symptom Checklist (HSC; Runtz, 2002). General physical health symptoms were measured with the HSC. This checklist assesses for the presence and frequency of 54 general health symptoms (e.g., nausea, fatigue, backaches) with an additional item for participants to write in "other" concerns. See Appendix N for a full list of items. Symptoms experienced in the past 6 months are rated on a Likert-type scale ranging from 0 (*not at all*) to 5 (*occurs daily*). The HSC showed good internal consistency reliability ($\alpha = .89$) in a large university sample (Runtz, 2002) and a similar reliability ($\alpha = .90$) in the present sample. Convergent validity has been demonstrated through significant correlations with a range of health-related variables (e.g., disease conviction, use of prescription and nonprescription medication, social, academic, and occupational functioning).

Sexual and reproductive health symptoms.

Reproductive Health Questionnaire (RHQ; Eadie & Runtz, 2007). The RHQ is a 40-item measure of sexual and reproductive health concerns among adult women. Participants report the frequency of health concerns (e.g., "irregular menstrual periods", "pain during intercourse") over the past 6 months using a scale ranging from 0 (*never*) to 3 (*often*), see Appendix O. Twenty items include a 'not applicable' (N/A) response category because they pertain either to having a menstrual period or being sexually active during the past 6 months, which may be conditions that are irrelevant to some participants. Because of the N/A option, all participants' scores are computed as a proportion of their total possible score. For example, if a participant answers 35 of the 40

items and selects N/A for the remaining 5 items, her total score will be computed out of 140 (35 items x 4 possible responses) instead of 160. RHQ total scores are then rescaled as a value out of 100, with higher scores indicating more sexual and reproductive concerns. A previous examination of the RHQ in a sample of university women demonstrated good internal consistency (α =.89; Eadie et al., 2008). In the present sample, Cronbach's α was .85.

Physician diagnosed disorders.

Medical Conditions Checklist. Participants were asked to indicate whether they have ever been diagnosed by a physician with any medical condition from a provided list (e.g., cancer, diabetes, and epilepsy). They were also asked to provide their age at the time of diagnosis. This checklist was created for the present study and was modeled after the format of intake questionnaires and screening measures used during initial patient intake in physicians' offices. See Appendix P for the complete list of conditions. Scoring involved a simple count of the number of diagnosed conditions indicated.

Functional impairment.

Functional impairment scale (FIS). Seven items used to assess functional impairment in a previous women's health study (Hager & Runtz, 2012; Runtz & Roche, 1999) were used to measure the extent to which participants' physical health interferes with their daily functioning. Items were selected 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) based in their relevance for use with nonclinical populations. Participants rated how often they have had each experience on a scale ranging from 0 (not at all) to 4 (a great deal). See Appendix Q for

specific items. Total scores range from 0 to 28, with use of the total score supported by findings from Hager and Runtz that the FIS represents a unidimensional construct. Internal consistency was high in the present sample (α = .93) and comparable to a previous study with the same measure (α = .90; Hager & Runtz, 2012).

Health perceptions.

The Cantril Self-Anchoring Ladder (Cantril, 1965) was used to assess overall health perceptions. This measure consists of a visual image of a ladder with rungs numbered from 1 (worst possible health) to 10 (best possible health); see Appendix R. Participants rated their current health, past health, future health, and best health. Scores can be used separately or averaged to represent overall perceived health. The latter method was used in the present analyses. Test-retest reliability of r = .79 has been previously demonstrated (Molzahn, as cited in Hilton et al., 2001). Cronbach's alpha was .74 in a previous study with university women (Eadie et al., 2008) and .63 in the present study.

Results

The results section is divided into five subsections: (1) missing data procedures; (2) prevalence rates for trauma experiences and PTSD; (3) associations between demographic variables and all other variables of interest; (4) associations among variables of interest; and (5) testing of structural equation models. Statistical analyses were conducted using SPSS Statistics 20.0 (IBM Corp., 2011) and AMOS 21.0 (IBM Corp., 2012).

Missing Data Procedures

Data were checked for missing values, and it was determined that all measures of interest had less than 5% missing data. The variables on which there were small amounts of missing data were checked for patterned responding. For the most part, missing values were the result of a small number of randomly skipped items. Eighty participants, in total, with nonrandom missing values were deleted from the analyses (Kline, 2011). Many of these participants had nonrandom missing data (e.g., skipped several or all items on one or more questionnaires) on several relevant measures. The subsample of deleted participants (n = 80) was compared to the retained sample (n = 475) and no significant differences were found on any of the demographic variables. Furthermore, there were no significant differences on any of the abuse variables except for ASA history. In the latter case, women who were retained in the analyses were slightly, but significantly, more likely to have identified a history of ASA than women who's data were deleted from the analyses ($\chi^2(1, N = 547) = 8.93, p < .01$).

Missing values determined to be missing at random were handled in the following ways. On the general physical health symptom scale (HSC), the functional impairment

scale (FIS), the measure assessing PTSS severity (PCL-C), and the alcohol use disorders measure (AUDIT), missing values were imputed using an expectation maximization (EM) algorithm. As described in the Methods section, the RHQ includes 'not applicable' (N/A) as a response option for specific items. For participants who selected the N/A option, total scores were computed based on the items to which they did respond.

Twenty-two participants provided responses on the PMR and the FVSQ for only one parent, responding "no answer" for the other parent. Due to the likelihood of these participants being from single-parent families, their scores on these measures were based on the responses provided for that one parent. For participants who provided data for both parents, the two scores were averaged so that all participant scores remained comparable. Seven participants responded "no answer" to the FVSQ items assessing intimate partner violence (IPV). Given the young age of this sample and the requirement of a romantic relationship history in order to have the experiences necessary to respond to these items, the missing values were changed to 0 (Never), and these participants were retained in the analyses. Similarly, missing responses on the measures assessing adult/adolescent sexual assault (SES) and child sexual abuse were examined in the context of answered items on these same scales. When a small number of missing items were accompanied by answered items with a response of 'no' (0), the missing responses were also replaced with 0s. The same procedure was followed for the measure of smoking behaviour (FTND): in 2 cases where a single item was missing in each case, the missing item was replaced with a 0 when found to be among a series of 'no' (0) responses.

Procedures for use of the Dysfunctional Sexual Behaviors subscale of the TSI-2 in research samples were outlined by the scale author (J. Briere, personal communication, June 2013), which included instructions for replacement of missing data. Specifically, if a participant responded to 4 of 5 items on this scale (80%), the missing item was replaced with the participant mean value for that subscale. If data on two or more items were missing, the participant was deleted from the analyses. Eighteen cases met this criterion and were deleted from analyses; however, most of these participants had non-random missing data on several other measures as well. There were no missing data on the scales assessing drug use (DAST10), sexual risk behaviours (SRS), and health perceptions (Cantril).

Prevalence Rates

Descriptive analyses were conducted to examine the prevalence of each interpersonal trauma type and the prevalence rate for PTSD. A summary of these prevalence rates is presented in Table 3. Although some measures of interpersonal trauma can be easily dichotomized (e.g., child sexual abuse), for others, the experiences fall along a continuum from normal behavior to severe victimization. For these (i.e., CPM, CN, WDV, and IPV), a cut-off criterion of one standard deviation above the sample mean is employed to identify participants reporting higher than typical levels of a specific trauma type. This method has been used in previous studies (Mullen et al., 1996; Van Bruggen, 2009) and is helpful in identifying *elevated* levels of maltreatment that are more likely to be persistent and problematic.

Child sexual abuse (CSA). Participants were considered to have experienced child sexual abuse if they reported unwanted sexual contact, oral sex, or intercourse prior

to the age of 14. Accordingly, twelve percent (*n* = 57) of the women in the sample had a history of CSA. While these experiences were not specifically categorized as CSA in this study, an additional 6.9% (*n* = 33) of women reported non-contact forms of sexual abuse, such as another individual non-consensually exposing their sex organs to the participant, someone threatening to have sex with them against their will. This resulted in a total rate of 18.9% (*n* = 90) of the sample reporting *any* form of non-consensual sexual behaviour in childhood.

Of those who endorsed any unwanted sexual experience in childhood (including exposure and threats), 93.5% (*n* = 86) indicated the perpetrator was male. The types of relationships the perpetrator had to the survivor were reported as follows: parental figure (8.7%; *n* = 8), other relative such as a sibling or cousin (20.7%; *n* = 19), childhood boyfriend or girlfriend (9.8%; *n* = 9), other person known to the survivor such as a babysitter or older acquaintance (40.2%; *n* = 37), and stranger (20.7%; *n* = 19). The median age of the perpetrator at the time of the abuse was 16 years old (*SD* = 12.0). The median age of the survivor at the beginning of the abuse was 10.5 years (*SD* = 4.2).

Table 3

Prevalence Rates for Interpersonal Trauma Types

Type of Victimization	n	%
Child Sexual Abuse (CSA)	57	12
Child Psychological Maltreatment (CPM)[a]	80	16.8
Child Psychological Neglect (CN)[a]	71	14.9
Child Physical Abuse (CPA)	113	23.8
Witnessing Domestic Violence (WDV)[a]	69	14.5
Adolescent/Adult Sexual Assault (ASA)	274	57.7
Non-consensual Sex (Rape + Coerced Sex)	156	32.8
Rape[c]	130	27.6
Attempted Rape[c]	140	29.7
Coercion Sex[c]	87	18.6
Attempted Coerced Sex[c]	114	24.3
Unwanted Sexual Contact[c]	220	47.0
Intimate Partner Violence (IPV)[a]	65	13.7
Psychological IPV[a]	70	14.7
Physical IPV[b]	52	10.9

[a]Proportion with scores at or above 1 *SD* above the scale mean.
[b]Number reporting at least 1 incident occurred at a rate of once/year or more.
[c]Proportions represent non-mutually exclusive, overlapping groups.
Note. values in % columns are valid percents based on *n* reporting for each item

Child psychological maltreatment (CPM). Almost all participants (96.8%, *n* = 460) endorsed at least one item on the Psychological Abuse subscale of the Psychological Maltreatment Review (PMR; Briere, 2006). However, at low frequencies, some of the behaviours listed on the PMR (e.g., "yelled at you," "embarrassed you in front of others") are common in the general population and considered somewhat acceptable (Briere et al., 2012; Daro & Gelles, 1992; Wolfe & McIsaac, 2011). CPM is more accurately characterized by a repeated and pervasive pattern of emotionally and psychologically

abusive behaviours on the part of the parent (American Professional Society on the Abuse of Children [APSAC], 1995; Glaser, 2002). One hundred eighty-three (38.5%) women reported at least one parental behaviour occurred 11 to 20 times per year, and 35.8% (*n* = 170) endorsed one or more items at a frequency of greater than 20 times per year. A stricter criterion than what is described above uses a cut-off of one standard deviation above the sample mean. Using this method 16.8% (*n* = 80) of women in this sample are classified as having experienced CPM.

Child psychological neglect (CN). Similar to CPM, psychological neglect in childhood is assessed along a continuum from normal childhood experiences to severe neglect, which can make it difficult to establish an accurate prevalence rate. Most women in this sample (84.2%, *n* = 400) endorsed at least one item from the Psychological Neglect subscale of the PMR. More specifically, 21.3% (*n* = 104) reported at least one incident of neglectful behaviour at a rate of 11 to 20 times per year and 21.9% (*n* = 104) endorsed one or more items at a frequency of more than 20 times per year. Finally, 14.9% (*n* = 71) of participants fell one standard deviation above the sample mean for child psychological neglect.

Child physical abuse (CPA). Participants were classified as having experienced CPA if they endorsed either of the Family Violence Screening Questionnaire items pertaining to physical abuse prior to the age of 18 at a frequency of once a year or greater. This resulted in 23.8% (*n* = 113) of women in the sample reporting physical abuse in childhood. Most of this group (23.4%, *n* = 111) was accounted for by individuals who reported that their parent "hit, kick, or beat" them. A smaller portion of the sample (3.8%, *n* = 18) stated that their parent "seriously threatened [their] life."

Witnessing domestic violence (WDV). In the area of witnessing a parent being aggressive with their partner, 49.1% (*n* = 233) of the sample endorsed at least one item at a frequency of once a year or greater. Numbers were similar when reported violence by a mother towards her partner and a father towards his partner (42.4%, *n* = 200 for mothers' behaviour; 44.5%, *n* = 206 for fathers' behaviour). Witnessing a parent's verbally aggressive behaviour (48.8%, *n* = 232) was far more common than witnessing physical violence between parental figures (8%, *n* = 38). Again, 14.5% (*n* = 69) of the women in this sample fell at one standard deviation above the mean for witnessing domestic violence.

Adolescent and adult sexual assault (ASA). As described in the method section, sexual assault experiences can be classified along a continuum of severity ranging from unwanted sexual contact to completed rape. In Canada, sexual assault is defined by the Criminal Code as any act of sexual touching that is done on purpose, whether directly or indirectly, without the consent of the other party (Department of Justice Canada, 2013). Including all forms of sexual assault assessed in this study in accordance with this definition, 57.7% (*n* = 274) of the sample endorsed sexual assault experiences since the age of 14. Using a more conservative assessment of sexual assault, 32.8 % (*n* = 156) of the sample reported non-consensual sex (i.e., oral, vaginal, or anal penetration) through means of force, threats, intoxication, or coercion. Looking specifically at each categorical group of sexual assault, rape, the most severe form of ASA was experienced by 27.7% (*n* = 130) of the women in this sample, as assessed by the behavioural items on the SES. In contrast, when asked "Have you ever been raped?", only 8.7% (*n* = 40) said yes. Almost thirty percent (*n* = 140) reported attempted rape and

24.3% (*n* = 114) of the sample reported attempts at non-consensual sex through coercion. Completed coerced sex was experienced by 18.6% (*n* = 87) of women, with the largest group (47%; *n* = 220) reporting unwanted sexual contact.

Of those who reported sexual assault experiences (*n* = 274) the vast majority (87.4%; *n* = 236) indicated they had experienced multiple incidents, with just 12.6% (n = 34) reporting a single incident of sexual assault. The mean number of ASA incidents was 7.22 (*SD* = 19.5). Almost all of the women who reported sexual assault (98%; *n* = 247) identified the perpetrator of their assault(s) as male.

Intimate partner violence (IPV). Women were considered to have experienced intimate partner violence if they reported that a romantic partner had been verbally aggressive or physically violent with them at a frequency of once a year or greater since they began dating. One hundred ninety-six women (41.3%) met this criterion. The exact same number of participants (41.3%, *n* = 196) reported psychological IPV, as assessed by verbal aggression by a romantic partner, at a frequency of once a year or greater, while a smaller portion of the sample (10.9%, *n* = 52) endorsed physical violence in an intimate relationship. Using a more conservative estimate of one standard deviation above the mean for elevated levels of IPV, 13.7% (*n* = 65) of women met this criterion.

Posttraumatic stress disorder (PTSD). Prevalence of posttraumatic stress disorder (PTSD), as assessed by the PCL-C, can be determined a few different ways. When the PCL is used as a screening tool, a threshold value for the total symptom severity score is typically used to identify those at risk of PTSD. A cut-off value of 44 (possible range: 17-85) has shown optimal diagnostic efficiency with non-military populations (Norris & Hamblen, 2003), though the National Center for PTSD

recommends a lower cut-off value range of 30-35 for general population studies (National Center for PTSD, 2012). A more accurate way of assessing PTSD prevalence is by determining the number of participants who meet diagnostic criteria based on their self-report of symptoms. Because the PCL is modelled after the symptom criteria in the *DSM-IV-TR*, these diagnostic criteria are used here. Specifically, participants are considered to have met symptom criteria for probable PTSD if they endorsed one or more reexperiencing symptoms, three or more avoidance/numbing symptoms, and two or more hyperarousal symptoms at a severity level of 'moderately', 'quite a bit', or 'extremely.' This method, however, potentially allows for participants with severity scores as low as 18 to be identified as PTSD positive; although this would be an unlikely occurrence. Nevertheless, a third option for determining probable PTSD diagnosis involves combining the two methods above so that a participant is only considered to be positive for PTSD if they meet diagnostic criteria *and* surpass a specified threshold value (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996; Ruggiero, Del Ben, Scotti, & Rabalais, 2003). The combined method was used in the present sample requiring that participants met *DSM-IV* symptom criteria *and* had a symptom severity score of 44 or above. This resulted in 18.3% (n = 87) of the total female sample being identified as having a probable diagnosis of PTSD at some point in their lifetime. The mean PTSS severity score for the total sample, as presented in Table 2, was 37.3 (SD = 15.5; range: 17-85).

Participants were also asked to indicate what type of traumatic experience they were thinking of as they responded to the PCL items. Of the 87 women who met symptom criteria for probable PTSD, 30% (n = 26) responded based on a sexual assault

in adolescence or adulthood, 8% (n = 7) were thinking of a child sexual abuse experience, 11.5% (n = 10) responded based on psychological maltreatment in childhood, 10.3% (n = 9) were thinking of physical abuse experiences, 8% (n = 7) reported based on violence in an intimate relationship, 2.3% (n = 2) were thinking of violence between their parental figures, and 4.6% (n = 4) responded based on multiple interpersonal traumas. The remaining participants did not indicate a traumatic experience or indicated 'other.' Of note, participants who wrote in other experiences that do not qualify under the *DSM-IV* criterion A1 definition of trauma (e.g., nontraumatic death, relationship breakup, etc.) were not considered to have met diagnostic criteria for PTSD and are not included in the above prevalence of 18.3%.

Demographic Variables

Zero-order correlations were computed to examine associations among continuous and ordinal demographic variables and victimization variables, PTSS severity, substance use variables, risky sexual behaviours, and health outcomes. Associations involving categorical demographic variables were analyzed using independent-samples t-tests and one-way ANOVAs when the other variable was continuous and through the use of chi-square tests when the other variable was also categorical. All significant results ($p < .05$) are presented below.

Age. Age of participants was positively correlated with most victimization variables, including frequency of child psychological maltreatment ($r = .10$, $p < .05$), child neglect ($r = .17$, $p < .001$), child physical abuse ($r = .14$, $p < .01$), intimate partner violence ($r = .12$, $p < .01$), and number of sexual trauma incidents ($r = .10$, $p < .05$). Age was also associated with childhood sexual abuse history, Welch's $t(60) = 2.96$, $p < .01$,

with survivors of contact CSA (M = 23.2, SD = 5.62) more likely to be older than non survivors (M = 20.9, SD = 2.90). Similarly, a t-test indicated a significant association between age and history of sexual assault in adolescence/adulthood (t(469) = 2.17, p < .05) revealing that those who had a history of sexual assault (M = 21.9, SD = 3.71) were significantly older than those with no SA history (M = 20.9, SD = 3.26), p < .01.

Age was not significantly associated with PTSS severity, PTSD diagnosis, or scores on the AUDIT. However, smokers (M = 20.9, SD = 3.03) were more likely to be older in age than non-smokers (M = 22.0, SD = 4.10), Welch's t(201) = 2.93, p < .01. Older participants also reported more frequent lifetime use of select substances (LSD, r = .37, p < .001; MDMA, r = .17, p < .001; Cocaine, r = .23, p < .001; Inhalants, r = .13, p < .01), and they reported greater problems related to drug use (r = .11, p < .05). Participant age was associated with greater sexual risk taking, as indicated by higher total scores on the Sexual Risk Survey (r = .17, p < .001). Finally, older participants reported poorer global health perceptions (r = -.13, p < .01) and greater functional impairment related to their health (r = .11, p < .05).

Ethnicity. The questionnaire item about ethnic affiliation originally contained seven groups including a write-in option, but due to small and uneven cell sizes, the original groups were collapsed into four categories: Asian, Caucasian, Mixed Race, and Other (African American/African Canadian, First Nations, Hispanic, and Other). One-way ANOVAs and chi-square tests revealed significant associations between ethnicity and several variables of interest. Specifically, there was a significant relation between ethnic affiliation and frequency of child physical abuse (CPA), F(3, 471) = 8.35, p < .001. The Games-Howell post-hoc test, an appropriate choice when group sizes differ

and unequal variances are expected, indicated that the only significant difference ($p < .05$) was between Asian ($M = 1.73$, $SD = 2.98$) and Caucasian ($M = 0.58$, $SD = 1.53$) participants, with Asian women reporting more frequent CPA. Similarly, there was a significant overall association between ethnicity and frequency of witnessing domestic violence in childhood, $F(3, 471) = 2.93$, $p < .05$; however, no significant contrasts between specific ethnic groups were indicated by post-hoc tests. There was also a significant relation between ethnic affiliation and history of ASA, $\chi^2(3, N = 475) = 11.95$, $p < .01$, with Asian participants less likely to report a history of ASA than other ethnic groups.

One-way ANOVAs also revealed that ethnicity was associated with scores on the AUDIT [$F(3, 471) = 8.33$, $p < .001$] and the DAST-10 [$F(3, 471) = 8.96$, $p < .001$]. Specifically, Caucasian participants ($M = 8.30$, $SD = 5.16$) reported significantly more alcohol use and associated problems than both Asian participants ($M = 5.36$, $SD = 5.27$) and those from other ethnic groups ($M = 5.43$, $SD = 4.76$). Furthermore, participants of mixed ethnicity reported higher rates of alcohol use than Asian participants ($M = 5.36$, $SD = 5.27$). Regarding drug use and abuse, Asian participants ($M = .51$, $SD = .88$) endorsed fewer items on the DAST-10 than both Caucasian participants ($M = 1.44$, $SD = 1.52$) and those of mixed ethnicity ($M = 1.17$, $SD = 1.14$). Ethnicity was also associated with sexual risk taking, $F(3, 471) = 17.44$, $p < .001$, with Asian participants ($M = 20.64$, $SD = 20.50$) reporting fewer risky sexual behaviours than Caucasians ($M = 42.21$, $SD = 24.13$) and participants of mixed ethnic background ($M = 40.83$, $SD = 25.37$)

Finally, ethnicity was significantly associated with two of the health outcome variables, general health symptoms as measured by the HSC and sexual and reproductive

health concerns, measured by the RHQ. Similar to previous results, Games-Howell post-hoc tests revealed that Asian participants reported fewer general health symptoms (M = 15.63, SD = 13.85) and fewer reproductive health concerns (M = 32.21, SD = 6.34) than both Caucasian participants (HSC: M = 23.89, SD = 17.73; RHQ: M = 36.22, SD = 6.91) and participants from mixed ethnicities (HSC: M = 24.43, SD = 17.43; RHQ: M = 36.12, SD = 8.57). No other variables of interest showed significant associations with ethnicity.

Country of origin. Participants were asked to identify their country of origin, and then categorized as born in Canada or born elsewhere. Significant associations were found between country of origin and several variables of interest. Beginning with trauma variables, participants born outside of Canada (M = 1.36, SD = 2.47) reported more frequent rates of child physical abuse than those born in Canada [M = .69, SD = 1.77; Welch's $t(122) = 2.50$, $p = .014$], and they were more likely to have a history of adolescent or adult sexual assault [χ^2 (1, N = 475) = 4.26, p = .04] than Canadian-born participants. For substance use variables, individuals born in Canada reported higher rates or were more likely to have reported substance use histories than those born in other countries. Specifically, Canadian-born participants were more likely to be smokers or have a history of smoking, χ^2 (1, N = 475) = 4.21, p = .04. Those born in Canada (M = 8.06, SD = 5.03) reported higher rates of alcohol use than those born elsewhere [M = 6.05, SD = 5.32; $t(473) = 3.47$, $p = .001$], and Canadian-born participants (M = 1.39, SD = 1.48) have higher rates of drug use than those from other countries of origin [M = .73, SD = 1.05; $t(205) = 5.02$, $p < .001$]. Similarly, those born in Canada (M = 41.54, SD = 24.85) endorsed much higher rates of sexual risk taking than participants born in other countries [M = 24.97, SD = 20.64; $t(473) = 6.05$, $p < .001$]. Finally, Canadian-born

participants reported higher rates of general health symptoms [$t(473) = 3.45$, $p = .001$; $M = 23.93$, $SD = 17.92$] and reproductive health concerns [$t(473) = 3.20$, $p = .001$; $M = 36.09$, $SD = 7.25$] than individuals born elsewhere (HSC: $M = 17.08$, $SD = 15.84$; RHQ: $M = 33.47$, $SD = 6.94$). Country of origin was not associated with any other variables of interest.

Personal socioeconomic status (SES). Participants' SES was measured by reported annual income and education level. Because the sample was comprised of undergraduate university students, there was very little variability in education level and analyses were not conducted on this variable. Annual income was collapsed into two groups (less than $10 000 and more than $10 000) due to limited endorsement of higher income categories, again presumably due to participants' status as university students. Only two variables showed an association with income categories: smoking status and drug use/abuse. A chi-square test showed that participants with a personal annual income less than $10 000 were significantly more likely to be smokers, now or in the past, than those who reported their income to be above $10 000, χ^2 (1, $N = 418$) = 11.68, $p = .001$. In contrast, participants with an annual income greater than $10 000 ($M = 1.59$, $SD = 1.75$) endorsed significantly more items related to illicit substance use on the drug abuse screening questionnaire than those with an income below $10 000 [$M = 1.21$, $SD = 1.32$; $t(171) = 2.10$, $p < .05$].

Parental socioeconomic status. Parental SES was assessed to indicate the socioeconomic environment in which participants were raised. Participants reported the annual income for their family of origin if they were still living at home at age 17. Income categories were combined into three groups with proportion of respondents

represented in parentheses: less than $50 000 (19%), $50 000 to $100 000 (41%), and more than $100 000 (39%). Participants also reported the highest level of education attained by their parents. This variable was also collapsed into three categories: primary/secondary/trade school (23%), some or all of an undergraduate university degree (38%), and an advanced university degree (e.g., Master's, M.D., Ph.D.; 39%), and used as an indicator of parental SES. Significant associations with either variable are reported below.

First, parental SES was associated with almost all of the interpersonal trauma variables assessed. Specifically, participants from families making less than $50 000 annually reported higher rates of psychological abuse [$F(2, 420) = 3.80$, $p < .05$; $M = 30.33$, $SD = 25.06$] and neglect [$F(2, 420) = 7.40$, $p = .001$; $M = 27.71$, $SD = 28.15$] than women from families earning more than $100 000 annually ($M = 22.70$, $SD = 20.03$; $M = 15.75$, $SD = 19.69$, respectively). One-way ANOVAs also revealed significant associations between family of origin income and frequency of child physical abuse [$F(2, 420) = 3.75$, $p < .05$] as well as witnessing domestic violence (WDV) in the home [$F(2, 420) = 3.62$, $p < .05$]; however, in both analyses, the Games-Howell post-hoc test did not reveal any significant contrasts between groups. There was also a significant association between parental education level and WDV, $F(2, 472) = 3.84$, $p < .05$, with more frequent WDV reported by participants whose parents had an undergraduate level of education ($M = 3.20$, $SD = 4.26$) as compared to participants from families where at least one parent earned an advanced degree ($M = 2.11$, $SD = 3.35$; $p = .019$). Chi-square tests revealed significant associations between family of origin income and both CSA and ASA. For CSA, participants from families earning less than $50 000 were more likely to

experience CSA than women from families earning more than $100 000, χ^2 (2, N = 423) = 7.27, $p < .05$. Similarly, women raised in families with an annual income less than $50 000 were more likely to experience adolescent or adult sexual assaults than participants from both higher income groups (i.e., $50 000 to $100 000 and more than $100 000).

The only substance use variable significantly associated with parental SES was alcohol use as measured by the AUDIT, $F(2, 420) = 3.70$, $p < .05$. Participants reporting a family of origin income greater than $100 000 ($M$ = 8.28, SD = 4.73) endorsed higher levels of alcohol use and associated problems than those from families earning less than $50 000 ($M$ = 6.44, SD = 5.19). Similarly, family of origin income level was significantly linked with risky sexual behaviours, $F(2, 420) = 4.47$, $p < .05$, with women from families earning more than $100 000 ($M$ = 42.58, SD = 25.45) engaging in higher rates of sexual risk taking than those from families earning less than $50 000 ($M$ = 32.60, SD = 26.23). Finally, both indicators of Parental SES were significantly associated with general health symptoms [Income: $F(2, 420) = 4.21$, $p < .05$; Education level: $F(2, 420) = 3.66$, $p < .05$]. In terms of family income, participants from middle income families (i.e., $50 000 to $100 000; M = 24.83, SD = 19.94) had significantly higher scores on the HSC than women from higher income families (i.e., > $100 000; M = 19.59, SD = 13.92). Participants whose parents earned a primary, secondary, or trade school diploma (M = 26.23, SD = 19.72) reported more frequent general health symptoms than women whose parent or parents held an advanced university degree (M = 20.51, SD = 15.11).

Sexual orientation. Participants were asked to self-identify their sexual orientation as: heterosexual, gay or lesbian, bisexual, or other. Due to small cell sizes, response options were collapsed into two categories: lesbian and bisexual or

heterosexual. Sexual orientation was significantly associated with almost all of the interpersonal trauma variables assessed. For child psychological maltreatment, Welch's $t(28) = 4.15$, $p < .001$, post-hoc tests revealed that lesbian and bisexual participants ($M = 48.96$, $SD = 29.64$) reported higher rates than heterosexual women ($M = 24.93$, $SD = 21.46$). Similarly, lesbian and bisexual women ($M = 43.63$, $SD = 35.58$) also reported more frequent psychological neglect in childhood than heterosexual women ($M = 18.46$, $SD = 22.22$), Welch's $t(27) = 3.63$, $p = .001$. Furthermore, lesbian and bisexual participants endorsed higher rates of child physical abuse [Welch's $t(27) = 2.44$, $p < .05$; $M = 2.11$, $SD = 2.86$] and witnessing domestic violence between their parents [Welch's $t(28) = 3.18$, $p < .01$; $M = 5.78$, $SD = 5.31$] than heterosexual women (CPA: $M = .75$, $SD = 1.86$; WDV: $M = 2.48$, $SD = 3.65$). Following the same pattern, intimate partner violence in adolescence and adulthood was significantly associated with sexual orientation, Welch's $t(27) = 2.68$, $p < .05$, with lesbian and bisexual women ($M = 5.15$, $SD = 6.28$) reporting more frequently IPV experiences than heterosexual women ($M = 1.87$, $SD = 3.56$). Finally, lesbian and bisexual women were more likely to have a history of CSA [χ^2 (1, $N = 473$) = 28.35, $p < .001$], but were not more likely to have experienced ASA [χ^2 (1, $N = 473$) = 1.94, $p = .16$] than heterosexual women. Given these associations between sexual orientation and interpersonal trauma experiences, it is perhaps not surprising that there was also a significant relation between sexual orientation and posttraumatic stress symptom (PTSS) severity, Welch's $t(28) = 4.26$, $p < .001$, with lesbian and bisexual participants ($M = 53.81$, $SD = 21.07$) reporting greater PTSS severity than heterosexual women ($M = 36.30$, $SD = 14.54$).

Sexual orientation was significantly associated with two of the substance use variables: smoking status χ^2 (1, N = 473) = 9.64, $p < .01$, and drug use/abuse, Welch's $t(27) = 3.14$, $p < .01$. Lesbian and bisexual women were more likely to be smokers or to have a history of smoking and they endorsed more indications of problematic drug use (M = 2.41, SD = 2.00) than heterosexual participants (M = 1.18, SD = 1.36). There was also a significant association between sexual orientation and both indicators of risky sexual behaviours: the Sexual Risk Survey (SRS), Welch's $t(28) = 3.78$, $p = .001$, and the Dysfunctional Sexual Behaviors subscale of the TSI-2, $t(471) = 2.42$, $p < .05$. Lesbian and bisexual participants scored higher on both measures (SRS: M = 59.54, SD = 30.46; DSB: M = 3.59, SD = 3.05), indicating that they engage in more risky sexual behaviours than heterosexual women (SRS: M = 36.96, SD = 24.01; DSB: M = 2.24, SD = 2.82).

Finally, *t*-tests were conducted to examine relations between sexual orientation and health outcome variables, revealing significant associations between sexual orientation and the HSC, Welch's $t(27) = 2.90$, $p < .01$, the RHQ, $t(471) = 2.48$, $p < .05$, the FIS, Welch's $t(28) = 2.84$, $p < .01$, and the Cantril Self-Anchoring Ladder, $t(471) = 3.06$, $p < .01$. Lesbian and bisexual women reported more general health symptoms (M = 37.22, SD = 27.57 vs. M = 21.64, SD = 16.61), more reproductive health concerns (M = 38.90, SD = 8.62 vs. M = 35.35, SD = 7.13), greater functional health impairment (M = 8.72, SD = 7.79 vs. M = 4.39, SD = 5.51), and worse overall health perceptions (M = 7.76, SD = .98 vs. M = 8.35, SD = .92) than heterosexual participants.

Relationship status. As part of the demographic questionnaire, participants were asked if they were "currently in a romantic relationship," allowing for two comparable groups: Single or In a Relationship. Relationship status was then associated with three

of the main variables of interest: frequency of intimate partner violence (IPV), $t(453) = 2.94$, $p < .01$, dysfunctional sexual behaviours, $t(405) = 4.28$, $p < .001$, and level of alcohol use, $t(413) = 2.58$, $p < .01$. Women who classified themselves as currently in a relationship ($M = 1.52$, $SD = 3.08$) endorsed significantly more frequent lifetime IPV than participants who were single at the time of responding ($M = 2.53$, $SD = 4.34$). In contrast, single women ($M = 2.93$, $SD = 3.13$) reported more often engaging in dysfunctional sexual behaviours, as assessed by the DSB subscale of the TSI-2, than women who were in a relationship ($M = 1.80$, $SD = 2.47$). Finally, single women ($M = 8.33$, $SD = 5.64$) also reported greater alcohol use and associated problems than participants who were in a relationship ($M = 7.09$, $SD = 4.62$).

Associations Among Measures

Associations between latent constructs are presented as part of the results from structural equation model testing. Bivariate correlations between all continuous or original variables of interest are presented in Tables 4 and 5. For the most part, correlations among interpersonal trauma variables were strong and significant, with the exception of nonsignificant associations between CPA and both ASA and number of sexual trauma incidents. Similarly, separate indicators within each construct (i.e., risky sexual behaviours, types of substance use, and adverse health outcomes) were all significantly associated with each other. As expected, PTSS severity was significantly correlated with all interpersonal trauma variables, as well as all substance use and adverse health variables. Furthermore, indicators across several constructs were also significantly correlated, including interpersonal trauma variables with adverse health outcomes, most interpersonal trauma variables with substance use indicators, some interpersonal trauma

variables with risky sexual behaviours, and finally, all risky sexual behaviour variables were significantly correlated with all substance use variables.

Some notable exceptions include low or nonsignificant correlations between risky sexual behaviours and most interpersonal trauma variables; although correlations between RSBs and both ASA and number of sexual trauma variables were significant. Similarly, RSBs were not significantly associated with most adverse health outcomes. There were also no significant correlations between substance use variables and two physical health outcomes: health-related functional impairment and global health perceptions. Finally, frequency of child physical abuse was not significantly related to three of the substance use variables (i.e., scores on the AUDIT, the DAST-10, and frequency of marijuana use), and CPA was not significantly correlated with general health symptoms or reproductive health concerns.

Table 4

Correlations between Interpersonal Trauma and RSB, Substance Use, and Health Variables

Variable	ASA	CSA	# traumas	CPM	CN	CPA	WDV	IPV
ASA	--							
CSA	.21***	--						
# Sexual traumas	.41***	.26***	--					
CPM	.28***	.23***	.30***	--				
Child Neglect	.19***	.29***	.20***	.63***	--			
CPA	.06	.19***	.06	.55***	.35***	--		
WDV	.15***	.19***	.14**	.55***	.48***	.39***	--	
IPV	.22***	.14**	.20***	.23***	.19***	.21***	.22***	--
PTSS severity	.33***	.30***	.38***	.39***	.42***	.23***	.29***	.31***
DSB	.26***	.05	.28***	.13**	.13**	.06	.09*	.08
SRS1	.18***	.02	.10*	.002	.02	.02	.00	.08
SRS2	.22***	.03	.14**	.10*	.07	.01	.06	-.01
SRS3	.16***	-.04	.11*	.04	.03	-.02	.06	-.09
AUDIT	.28***	.06	.21***	.12**	.08	-.08	.08	.17***
DAST-10	.27***	.15***	.22***	.16***	.14**	.04	.16***	.27***
Marijuana use	.26***	.15***	.13**	.11*	.13**	.06	.12*	.22***
Smoking	.22***	.21***	.14**	.10*	.11*	.13**	.12*	.16***
HSC	.22***	.25***	.21***	.26***	.25***	.07	.22***	.19***
RHQ	.26***	13**	.18***	.23***	.19***	.04	.21***	.13**
Functional health	.15**	.17***	.10*	.24***	.18***	.17**	.18***	.07
Health perceptions	-.20***	-.15**	-.17***	-.28***	-.26***	-.16***	-.14**	-.19***

Note. ASA = adult sexual assault; CSA = child sexual abuse; CPM = child psychological maltreatment; CN = child neglect; CPA = child physical abuse; WDV = witnessing domestic violence; IPV = adult intimate partner violence; PTSS = posttraumatic stress symptoms; DSB = Dysfunctional Sexual Behaviors subscale of TSI-2; SRS1 = sexual risk taking with uncommitted partners; SRS2 = impulsive sexual behaviours; SRS3 = Intent to engage in risky sexual behaviours; AUDIT = alcohol use; DAST-10 = drug use/abuse; HSC = general health symptoms; RHQ = reproductive health concerns. *$p < .05$. **$p \leq .01$. ***$p \leq .001$

Table 5

Correlations among Risky Sexual Behaviours, Substance Use, and Health Variables

Variable	PTSS	DSB	SRS1	SRS2	SRS3	AUDIT	DAST-10	Mariju.	Smoke	HSC	RHQ	FIS	Health percep
PTSS	--												
DSB	.25***	--											
SRS1	.08	.66***	--										
SRS2	.13**	.60***	.60***	--									
SRS3	.03	.52***	.50***	.60***	--								
AUDIT	.25***	.43***	.34***	.38***	.29***	--							
DAST-10	.30***	.35***	.27***	.18***	.15***	.45***	--						
Marijuana use	.24***	.28**	.25***	.17***	.13**	.48***	.71***	--					
Smoking	.14**	.23***	.24***	.18***	.12**	.32***	.48***	.49***	--				
HSC	.44***	.24**	.04	.06	.06	.17***	.27***	.20***	.04	--			
RHQ	.32***	.24**	.04	.03	.10*	.12*	.19**	.16***	.03	.62***	--		
Functional health	.32***	.02	-.06	-.06	-.04	.01	.09	.06	.02	.47***	.37***	--	
Health perceptions	-.38***	-.15***	-.08	-.02	-.05	-.08	-.09	-.04	-.08	-.35***	-.30***	-.44***	--

Note. PTSS = posttraumatic stress symptom severity; DSB = Dysfunctional Sexual Behaviors subscale of TSI-2; SRS1 = sexual risk taking with uncommitted partners; SRS2 = impulsive sexual behaviours; SRS3 = Intent to engage in risky sexual behaviours; AUDIT = alcohol use; DAST-10 = drug use/abuse; HSC = general health symptoms; RHQ = reproductive health concerns; FIS = functional health impairment.
*$p < .05$. **$p \leq .01$. ***$p \leq .001$

Structural Equation Model Testing

The hypothesized models were tested using structural equation analyses with IBM SPSS Amos 20.0 (IBM Corp, 2011). Structural Equation Modeling (SEM) estimates pathways between latent variables, considering all relations at the same time and minimizing the effects of measurement error. Models are evaluated based on the fit of the proposed model to the data. A number of fit indexes are used to quantify goodness-of-fit. First and foremost, the *chi-square goodness-of-fit index* is a measure of the discrepancy between the observed covariances in the data and the pattern of covariances specified in the model (Byrne, 2001). A nonsignificant chi-square value is desirable as this indicates the observed covariances are consistent with the pathways specified in the model (Hoyle & Panter, 1995). However, the chi-square significance test is considerably impacted by sample size (Kline, 2011). Accordingly, the ratio of chi-square to degrees of freedom (χ^2/df; Bollen, 1989) will be presented along with the level of significance. A χ^2/df ratio less than 3.0 is ideal (Kline, 2011), with a value less than 5.0 considered acceptable (Jöreskog & Sörbom, 1993).

Additional indices of fit are based on a comparison to one of two types of baseline models. The independence model is the most restricted and represents a model in which all variables are assumed to be independent of each other (i.e., all relations among variables are zero). In contrast, the saturated model is the least restricted and represents a model in which the number of parameter estimates is equal to the number of data points (Byrne, 2001). The *Comparative Fit Index* (CFI; Bentler, 1990) is an incremental index that evaluates how well the model fits as compared to a baseline model, typically the independence model. CFI values range from zero to 1.0, with values of .95 or higher

indicating good fit (Hu & Bentler, 1999). The *Tucker-Lewis Index* (TLI) also measures how well the model fits compared to a baseline, independent model, but additionally takes into account the complexity of the model (Byrne, 2001). Similar to CFI, values for TLI indicate good model fit the closer they are to 1.0. Finally, the *Root Mean Square Error of Approximation* (RMSEA; Steiger, 1990) estimates the lack of model fit (i.e., a "badness-of-fit" index) as compared to the saturated model where a value of zero indicates the best possible fit. RMSEA values less than .05 represent excellent fit, values from .05 to .08 indicate good fit, and values from .08 to .10 indicate mediocre fit (Browne & Cudeck, 1993; Hu & Bentler, 1999; Kline, 2011). A 90% confidence interval (CI) is presented along with the RMSEA value to indicate the precision of the estimate (MacCallum, Browne, & Sugawara, 1996).

For all models, maximum likelihood (ML) was used to estimate parameters. Not only is ML the most commonly used method of estimation, but it also functions well under less than optimal conditions, such as violations of normality and excessive kurtosis (Hoyle, 1995), which is particularly relevant for some of the variables presented.

Measurement models. The measurement model is presented to demonstrate the degree of relation between the observed indicator variables and the underlying constructs they are intended to measure (i.e., unobserved latent variables). Before testing the structural model, the measurement model must be tested and established as having an adequate fit to the data (Byrne, 2001; Kline, 2011). Recall that model components represented by rectangles are observed, or measured variables, while those represented by circles are latent, or unmeasured variables. Variables labelled with an 'e' are error variances associated with measured variables, while those labelled with a 'd' are

disturbances associated with latent variables. Specific path values in the model diagrams represent standardized coefficients. In order to provide a metric for each latent variable, one regression coefficient per latent construct was fixed to a value of one. Measurement models for each of the latent variables will be presented separately, followed by four complete measurement models, one for each of the hypothesized structural models.

Interpersonal trauma measurement models. The first measurement model consisted of a latent construct of *interpersonal trauma* with seven indicators: child sexual abuse severity (CSA), severity of adult and adolescent sexual assault (ASA), and frequency of each of the following: child psychological maltreatment (CPM), child neglect (CN), child physical abuse (CP), witnessing domestic violence (WDV), and adult/adolescent intimate partner violence (IPV). When tested as a single latent construct, the overall model fit was poor, $\chi^2/df = 6.11$, $p < .001$, CFI = .91, TLI = .86, RMSEA = .10 (90% C.I. = .08, .13), and while the indicator loadings were all significant, there was considerable variability among them, ranging from $r = .30$ to .89. Grounded in a theoretical understanding that sexual traumas are often contextualized and experienced differently than physical and psychological forms of trauma, the decision was made to split the interpersonal trauma construct into two separate latent variables: sexual trauma and nonsexual interpersonal trauma.

Next, a measurement model for the latent construct *sexual trauma* was tested. With only two indicators representing sexual traumas (CSA and ASA) included in the original interpersonal trauma model, a third indicator: total number of sexual trauma incidents, was added to the sexual trauma latent construct to allow for an identified model. The sexual trauma measurement model demonstrated good model fit, $\chi^2/df =$

2.67, *ns*, CFI = .99, TLI = .96, RMSEA = .06 (90% C.I. = .00, .12), with all indicators loading significantly (r = .42 to .66).

The remaining indicators representing psychological and physical maltreatment were organized into a new latent construct termed *nonsexual trauma*. The measurement model for this construct was an adequate fit to the data, χ^2/df = 3.29, p = .006, CFI = .98, TLI = .96, RMSEA = .07 (90% C.I. = .03, .11), with significant loadings for all indicators.

Risky sexual behaviours measurement model. The next measurement model examined the latent construct of risky sexual behaviours. The first test of this model included six indicators: the dysfunctional sexual behaviours subscale of the Trauma Symptom Inventory – 2 (TSI-2), and all five subscales of the Sexual Risk Survey (SRS). The initial model fit was poor, χ^2/df = 14.28, p < .001, CFI = .87, TLI = .78, RMSEA = .17 (90% C.I. = .14, .19), and the loading for the indicator 'Risky Anal Sex Acts' was low and nonsignificant. This indicator was judged to be a poor representative of this latent construct, particularly in the present sample, and the indicator was subsequently deleted and the model was re-run. Model fit remained poor, χ^2/df = 15.89, p < .001, CFI = .91, TLI = .82, RMSEA = .18 (90% C.I. = .14, .21). Even though all indicators loaded significantly, the loading for 'Risky Sex Acts', r = .21, remained considerably lower than all other loadings (r = .67 to .80). This indicator was also deleted. Furthermore, specific items for the remaining SRS subscales were examined and because two subscales (i.e., Impulsive Sexual Behaviours and Intent to Engage in Risky Sexual Behaviour) had very similarly worded items, a covariance between the residuals for these two subscales was added. The final model, with the following 4 indicators: dysfunctional sexual

behaviours, sexual risk taking with uncommitted partners, impulsive sexual behaviours, and intent to engage in risky sexual behaviour, was tested and found to be an excellent fit to the data, $\chi^2/df = .49$, *ns*, CFI = 1.0, TLI = 1.0, RMSEA = .00 (90% C.I. = .00, .11). Indicator loadings ranged from $r = .62$ to .82.

Substance use behaviours measurement model. For the substance use latent construct, the original hypothesized measurement model included three indicators: alcohol use (AUDIT score), drug use (DAST-10 score), and smoking status. The assessment of substance use frequencies revealed that rates of marijuana use were particularly high in this sample (69%, $n = 328$ having ever used and 20.2%, $n = 96$ using 40 or more times in their life) as compared to use of other substances (e.g., 12.4%, $n = 59$ endorsed using cocaine at least once in their lifetime, 1.3%, $n = 5$ reported ever using crystal methamphetamine). Consequently, an additional variable representing frequency of marijuana use (ranging from never to 40 or more times) was added as a fourth indicator for the substance use behaviours construct. The model was assessed to have excellent fit, $\chi^2/df = .12$, *ns*, CFI = 1.0, TLI = 1.0, RMSEA = .00 (90% C.I. = .00, .04), with significant loadings ranging from $r = .55$ to .86. No further modifications were made to the measurement model.

Adverse health outcomes measurement model. Finally, the proposed physical health construct included five potential indicators: general health symptoms (HSC), reproductive and sexual health concerns (RHQ), functional health impairment (FIS), global health perceptions, and a sum of diagnosed medical conditions. The measurement model was assessed and the initial model fit was poor, $\chi^2/df = 10.96$, $p < .001$, CFI = .91, TLI = .83, RMSEA = .14 (90% C.I. = .11, .18). Because the HSC and the RHQ are

structured in a very similar way, use similar measurement response scales, and contain some overlap in item content, a covariance parameter was added between the residuals for these two measures. In addition, the indicator for diagnosed medical conditions was dropped because the measure for this variable has not been psychometrically validated and was judged to be a weaker measure overall. Furthermore, the loading coefficient for medical conditions was the lowest in the model (r = .46). The modified measurement model was tested and found to have excellent model fit, χ^2/df = .10, *ns*, CFI = 1.0, TLI = 1.0, RMSEA = .00 (90% C.I. = .00, .08). All indicators showed significant loadings, ranging in strength from r = .49 to .77.

Full measurement models. Once the individual latent variables were deemed to meet criteria for measurement model fit, variables were integrated into four separate measurement models, one for each of the hypothesized structural models. Each measurement model includes three latent variables and one measured variable, detailed below.

Measurement model 1: Sexual trauma, PTSS, RSBs, and adverse health outcomes. The first full measurement model consists of a latent variable for *sexual trauma* with three indicators: CSA severity, ASA severity, and number of sexual trauma incidents; a measured variable representing *PTSS severity*; a second latent variable for *risky sexual behaviours* (RSBs) with four indicators: dysfunctional sexual behaviours (TSI-2 subscale), sexual risk taking with uncommitted partners, impulsive sexual behaviours, and intent to engage in risky sexual behaviour (all SRS subscales). A final latent variable represents *adverse health outcomes* with four indicators: general health symptoms (HSC), reproductive health concerns (RHQ), level of functional health impairment (FIS), and

global health perceptions. The model demonstrated good fit to the data, $\chi^2/df = 2.58$, $p < .001$, CFI = .96, TLI = .94, RMSEA = .06 (90% C.I. = .05, .07). All indicators loaded significantly on their respective latent constructs, and all covariances were significant with the exception of the covariance between RSBs and adverse health outcomes. See Figure 3 for the full measurement model, including specific path coefficients.

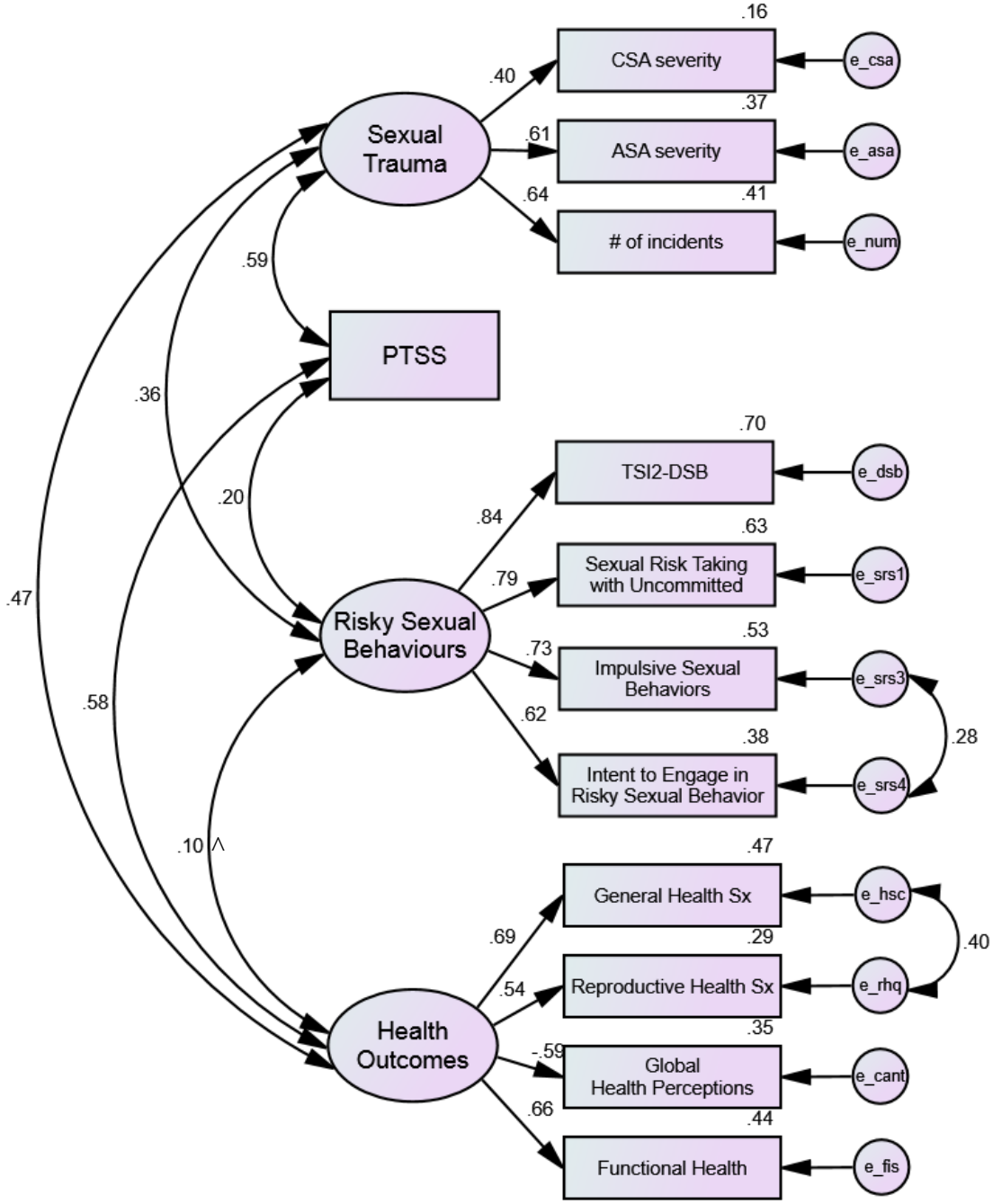

Figure 3. Measurement Model 1: Associations among sexual trauma, PTSS, RSBs, and adverse health outcomes.
Note: all path coefficients are significant at $p < .001$ unless otherwise indicated by ^.

Measurement model 2: Nonsexual trauma, PTSS, RSBs, and adverse health outcomes. The second measurement model is the same as the first with the exception of the interpersonal trauma construct. This model contains a latent variable for *nonsexual trauma* with five indicators: frequency of each CPM, CN, CPA, WDV, and IPV. The measured variable representing *PTSS severity*, the *RSBs* latent variable, and the *adverse health outcomes* latent variable all remain the same. The measurement model was well-fitting, $\chi^2/df = 2.59$, $p < .001$, CFI = .95, TLI = .94, RMSEA = .06 (90% C.I. = .05, .07). All indicators loaded significantly on their respective latent constructs, and all covariances were significant, again, with the exception of the covariance between RSBs and adverse health outcomes. See Figure 4 for the full measurement model, including specific path coefficients.

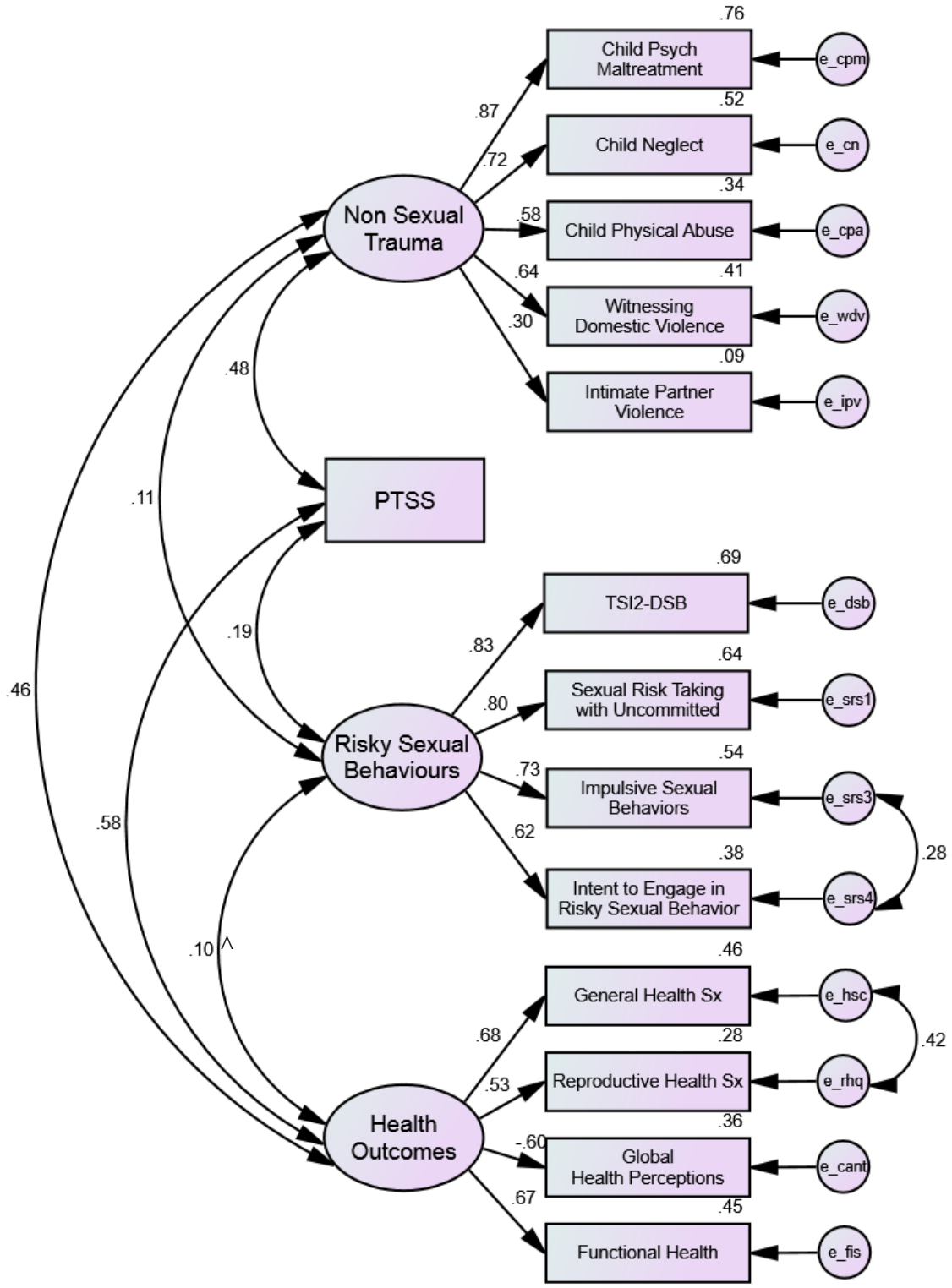

Figure 4. Measurement Model 2: Associations among nonsexual trauma, PTSS, RSBs, and adverse health outcomes
Note: all path coefficients are significant at $p < .001$ unless otherwise indicated by ^.

Measurement model 3: Sexual trauma, PTSS, substance use, and physical health outcomes. The third measurement model is similar to the first model above, except that in place of the RSB latent it includes the substance use latent variable, with its four indicators: alcohol use, illicit drug use, frequency of marijuana use, and smoking status. The latent variables for *sexual trauma* and *health outcomes*, as well as the measured variable *PTSS severity*, are all the same as in Measurement Model 1. This model was a good fit to the data, $\chi^2/df = 2.68$, $p < .001$, CFI = .95, TLI = .93, RMSEA = .06 (90% C.I. = .05, .07). All indicator loadings and covariances were significant at the $p < .001$ level. See Figure 5 for the full measurement model, including specific path coefficients.

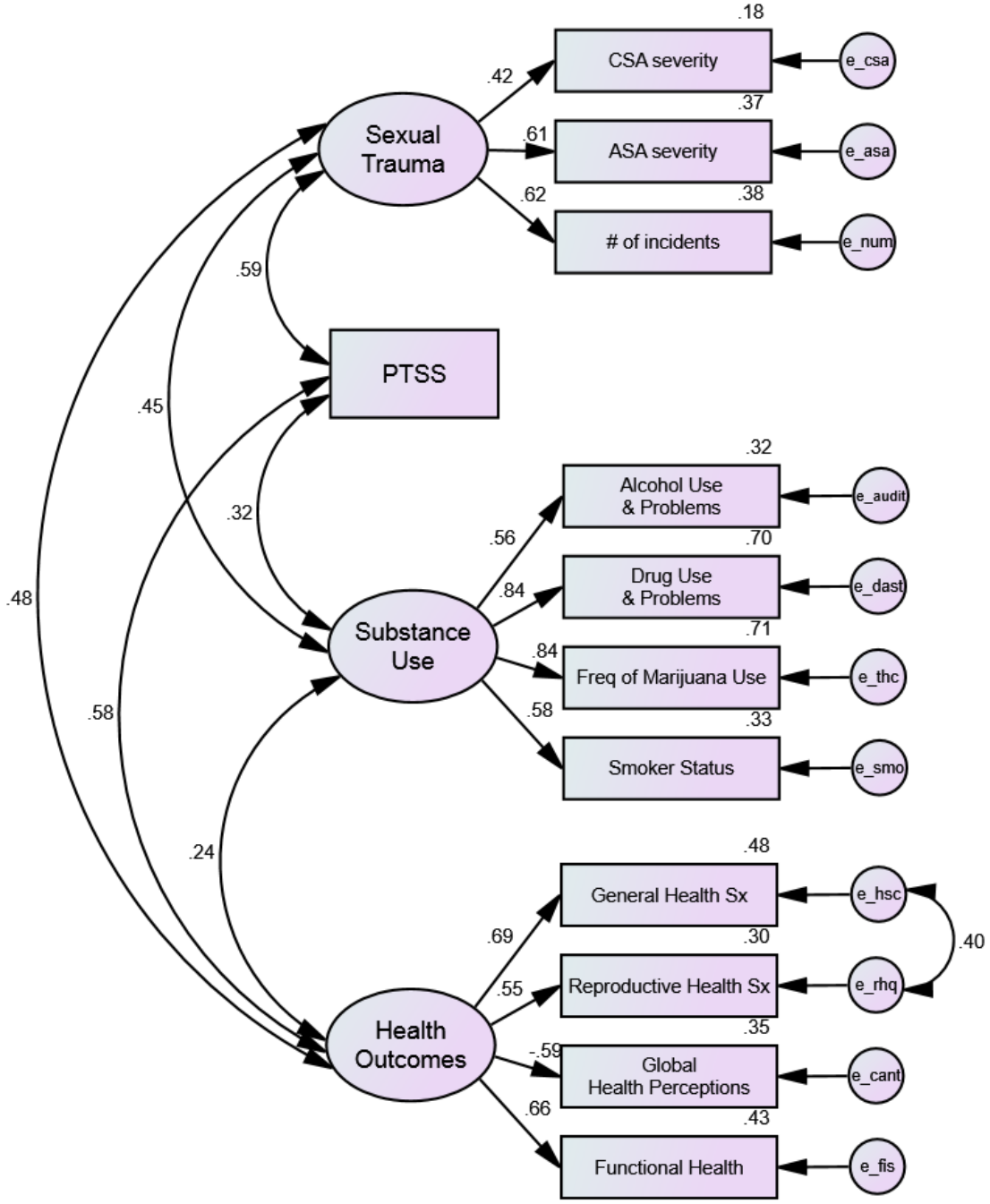

Figure 5. Measurement Model 3: Associations among sexual trauma, PTSS, substance use, and adverse health outcomes
Note: all path coefficients are significant at $p < .001$.

Measurement model 4: Nonsexual trauma, PTSS, substance use, and adverse health outcomes. The final measurement model is to Measurement Model 3, except that it includes the latent variable *nonsexual trauma* instead of that for sexual trauma. Again, the measured variable representing *PTSS severity*, the *substance use* latent variable, and the *adverse health outcomes* latent variable all remain the same. The measurement model was an adequate fit to the data, $\chi^2/df = 2.81$, $p < .001$, CFI = .94, TLI = .92, RMSEA = .06 (90% C.I. = .05, .07). All indicators loaded significantly on their respective latent constructs, and all covariances were significant at the $p < .001$ level. See Figure 6 for the full measurement model, including specific path coefficients.

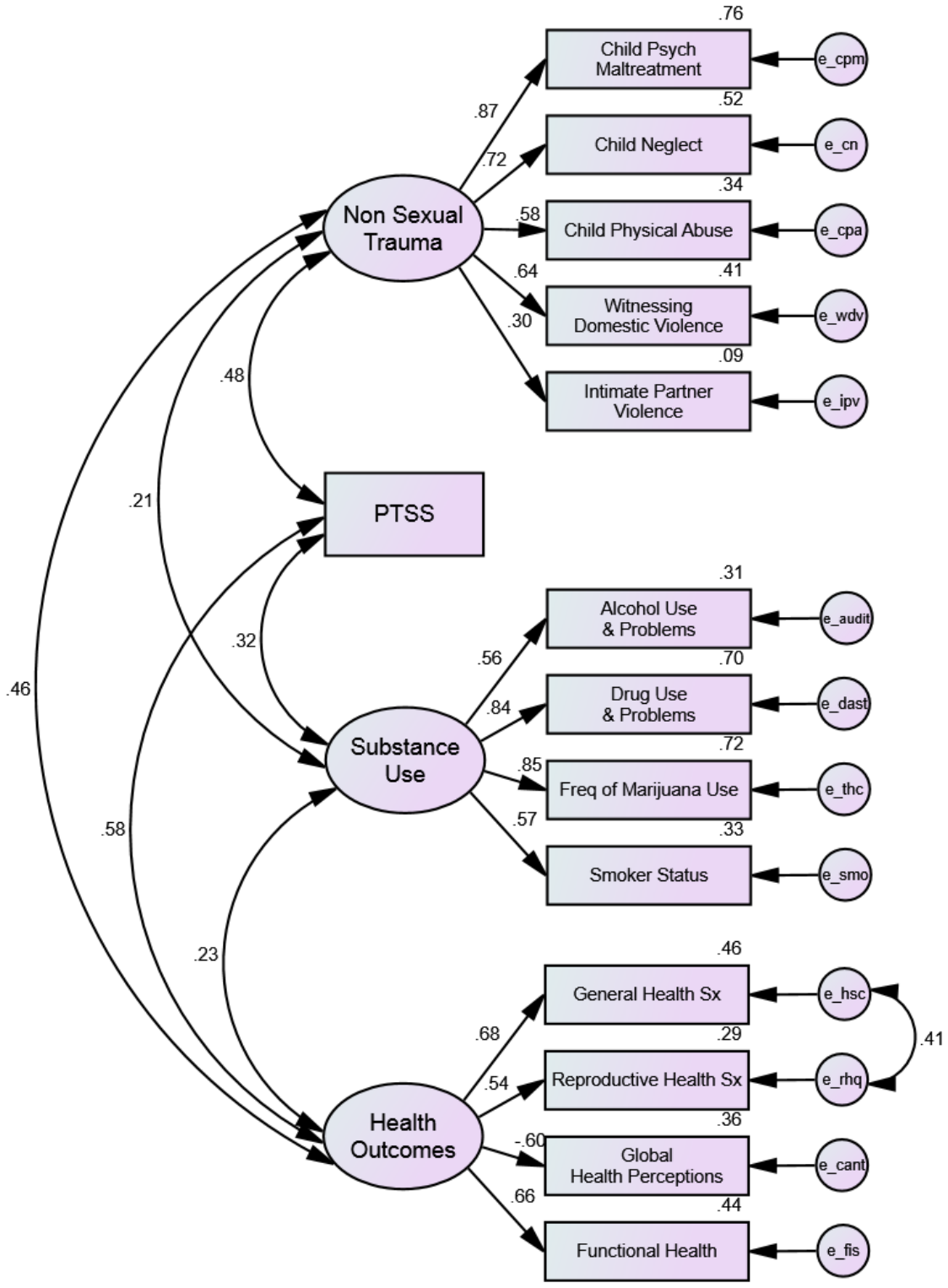

Figure 6. Measurement Model 4: Associations among nonsexual trauma, PTSS, substance use, and adverse health outcomes

Note: all path coefficients are significant at $p < .001$.

Direct effects models. Prior to testing the full structural models, direct effects models were tested for each directional pathway between individual latent variables and pathways between the measured variable for PTSS severity and each latent variable. This was done with a few goals in mind: to test specific hypotheses involving a directional association between two variables, to establish the strength of these relations in isolation, and to establish the preconditions for mediation testing. The first model is presented in Figure 7, with subsequent models described only in the text.

Model 1: Direct effects pathway between sexual trauma and adverse health outcomes. The first model looks at the association between the latent sexual trauma variable (CSA severity, ASA severity, and number of sexual trauma incidents), and the latent variable for adverse health outcomes (general health symptoms, sexual and reproductive health concerns, health-related functional impairment, and general health perceptions). The hypothesis that severity of sexual trauma history would be associated with poorer health outcomes was supported by the data, with a well-fitting model, χ^2/df = 2.86, p = .001, CFI = .97, TLI = .94, RMSEA = .06 (90% C.I. = .04 .09). Sexual trauma was significantly related to adverse health outcomes, β = .46, p < .001, accounting for 22% of the variance in health outcomes. All indicators for both latent variables were strong and significant.

Model 2: Direct effects pathway between nonsexual trauma and adverse health outcomes. The next model investigates the link between severity of nonsexual trauma experiences (i.e., CPM, CN, CPA, WDV, IPV), and adverse health outcomes. Similar to Model 1, it was hypothesized that trauma history would be associated with worse health outcomes. This model was also a good fit to the data, χ^2/df = 2.65, p < .001, CFI = .97,

TLI = .95, RMSEA = .06 (90% C.I. = .04 .08), with a significant association between nonsexual trauma and adverse health outcomes, $\beta = .44$, $p < .001$, and 20% of the variance in health outcomes accounted for by nonsexual trauma history. All indicators for both latent variables were significant.

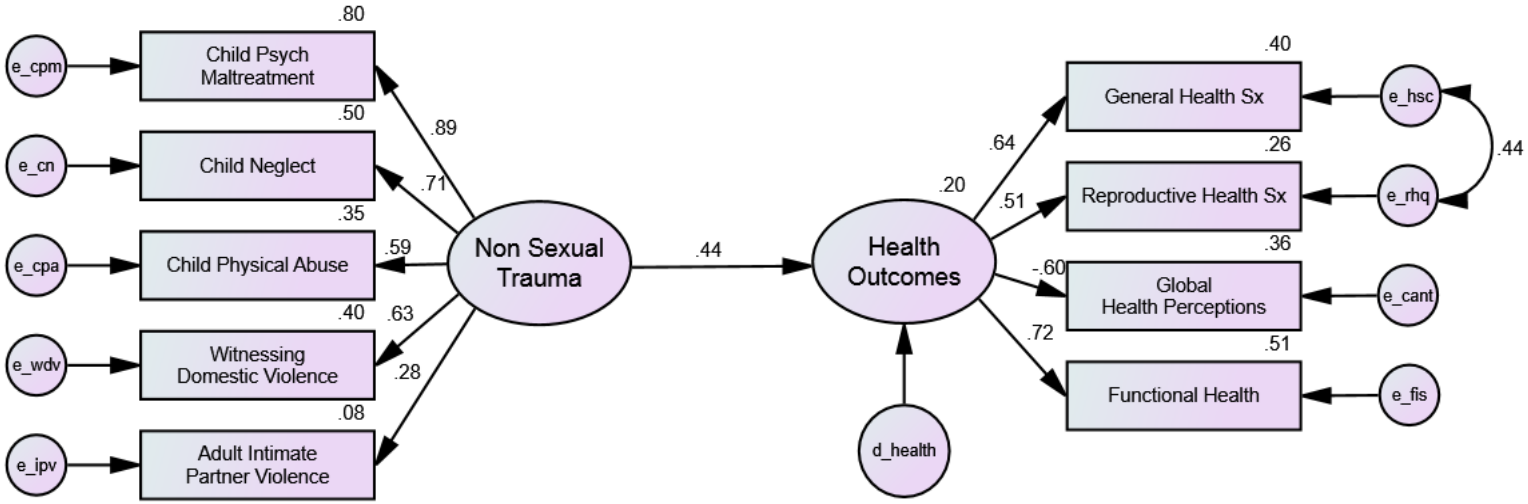

Figure 7. Model 1: Direct effects pathway between sexual trauma and adverse health outcomes.
Note: all path coefficients are significant at $p < .001$.

Model 3: Direct effects pathway between sexual trauma and PTSS severity. The direct effect of sexual trauma history on severity of PTS symptoms was examined next. As hypothesized, severity and number of sexual trauma experiences were significantly associated with PTSS severity, $\beta = .59$, $p < .001$, with 35% of the variance in PTSS accounted for. The model fit the data very well, $\chi^2/df = 2.67$, *ns*, CFI = .99, TLI = .96, RMSEA = .06 (90% C.I. = .00 .12), and all indicators significantly loaded onto the sexual trauma latent variable.

Model 4: Direct effects pathway between nonsexual trauma and PTSS severity. The association between nonsexual trauma history and PTSS severity was also tested, with the expectation that nonsexual trauma history would have a significant effect on PTS symptoms. This hypothesis was confirmed, $\beta = .48$, $p < .001$, with 23% of the variance in PTSS accounted for by nonsexual trauma, and all five indicators loading significantly onto the nonsexual trauma latent variable. However, the model fit fell below acceptable thresholds, $\chi^2/df = 5.47$, $p < .001$, CFI = .95, TLI = .91, RMSEA = .10 (90% C.I. = .07 .12).

Model 5: Direct effects pathway between PTSS severity and adverse health outcomes. It was hypothesized that there would be a direct association between PTSS and health outcomes. Consistent with this hypothesis, PTSS severity was significantly linked with worse physical health, $\beta = .58$, $p < .001$, with 34% of the variance in health outcomes accounted for by PTSS. This model was an adequate, though not ideal, fit to the data, $\chi^2/df = 4.22$, $p = .002$, CFI = .98, TLI = .94, RMSEA = .08 (90% C.I. = .04 .12). All indicators significantly loaded onto the physical health latent variable.

Model 6: Direct effects pathway between sexual trauma and risky sexual behaviours (RSBs). The next model looked at the direct association between sexual trauma history and RSBs. As hypothesized, severity and number of sexual trauma experiences were linked with higher levels of sexual risk taking, $\beta = .37$, $p < .001$, with 13% of the variance in RSBs accounted for. The model was an adequate fit to the data, $\chi^2/df = 3.05$, $p < .001$, CFI = .97, TLI = .96, RMSEA = .07 (90% C.I. = .04 .09), and all indicator loadings were significant for both latent variables.

Model 7: Direct effects pathway between nonsexual trauma and RSBs. Similar to the previous model, it was also hypothesized that there would be a direct association between nonsexual trauma history and risky sexual behaviours. In contrast, however, frequency of nonsexual trauma experiences was not significantly linked with RSBs, $\beta = .10$, $p = .053$. Nevertheless, the overall model was good fit to the data, $\chi^2/df = 2.26$, $p < .001$, CFI = .98, TLI = .97, RMSEA = .05 (90% C.I. = .03 .07), and all indicators loaded significantly onto both latent variables.

Model 8: Direct effects pathway between sexual trauma and substance use. Next, the link between trauma history and substance use behaviours was investigated. As hypothesized, severity and number of sexual trauma experiences were linked with greater use of substances and indicators of substance abuse, $\beta = .45$, $p < .001$, with 21% of the variance in substance use accounted for by sexual trauma history. The model was well-fitting, $\chi^2/df = 2.85$, $p < .001$, CFI = .97, TLI = .95, RMSEA = .06 (90% C.I. = .04 .09), and all indicator loadings were significant for both latent variables.

Model 9: Direct effects pathway between nonsexual trauma and substance use. Similarly, it was hypothesized that there would be a direct effect of nonsexual trauma

history on substance use behaviour. This hypothesis was confirmed with a significant association between frequency of nonsexual trauma experiences and substance use behaviours, $\beta = .20$, $p < .001$; however, only 4% of the variance in substance use was accounted for by nonsexual trauma experiences. The model was an adequate fit to the data, $\chi^2/df = 3.22$, $p < .001$, CFI = .96, TLI = .94, RMSEA = .07 (90% C.I. = .05 .08), and all indicator loadings were significant for both latent variables.

Model 10: Direct effects pathway between PTSS severity and RSBs. Next, it was hypothesized that there would be a significant association between PTSS severity and risky sexual behaviours. This was found to be the case with PTSS severity significantly predicting sexual risk taking, $\beta = .19$, $p < .001$; although only 4% of the variance in RSBs was accounted for by this pathway. Moreover, the model was a less than adequate fit to the data, $\chi^2/df = 6.83$, $p = .002$, CFI = .97, TLI = .93, RMSEA = .11 (90% C.I. = .07 .15). Nevertheless, all indicators loaded significantly onto the RSB latent variable.

Model 11: Direct effects pathway between PTSS severity and substance use. Similar to Model 10, the hypothesis that there would be a significant association between PTSS severity and substance use behaviours was tested. This hypothesis was confirmed, $\beta = .32$, $p < .001$; with 10% of the variance in substance use behaviours accounted for by PTSS severity. Furthermore, the model was an excellent fit to the data, $\chi^2/df = 2.064$, *ns*, CFI = .99, TLI = .98, RMSEA = .05 (90% C.I. = .00 .09) and all substance use indicators loaded significantly onto the latent variable.

Model 12: Direct effects pathway between RSBs and physical health. In order to establish risky sexual behaviours as a potential mediator of the association between PTSS

and health outcomes, it was hypothesized that there would be a direct link between RSBs and physical health. Similar to Model 7, this pathway was not significant, $\beta = .06$, $p = .28$; however, the model remained well-fitting, $\chi^2/df = 2.10$, $p = .005$, CFI = .99, TLI = .98, RMSEA = .05 (90% C.I. = .03 .07), and all indicators loaded significantly onto both latent variables.

Model 13: Direct effects pathway between substance use and physical health. Finally, it was hypothesized that substance use and abuse behaviours would be significantly associated with adverse health outcomes. This hypothesis was confirmed with a significant pathway, $\beta = .21$, $p < .001$, and 4% of the variance in health outcomes accounted for by substance use. The model was well-fitting, $\chi^2/df = 2.61$, $p < .001$, CFI = .97, TLI = .96, RMSEA = .06 (90% C.I. = .04 .08), and all indicators loaded significantly onto both latent variables.

Mediation models. Several mediation pathways were hypothesized. These are tested along with the fit of the four structural models below. In SEM, evidence of partial mediation is demonstrated by: 1) good model fit; 2) non-zero and significant indirect paths between the predictor and the mediator (path *a*), and between the mediator and the criterion (path *b*); 3) a reduction in the strength of path *c* from predictor to criterion when the mediator is included in the model; and 4) a significant Sobel test. Full mediation is considered when criteria (1) and (2) above are met; when 3) path *c* from predictor to criterion is zero and non-significant; and 4) there is no improvement in model fit, as indicated by a non-significant χ^2_{DIF} test, when comparing the mediated model (i.e., when path *c* is constrained to zero) to a model in which all paths are left free to vary. See Figure 8 for a visual representation of a generic mediation model.

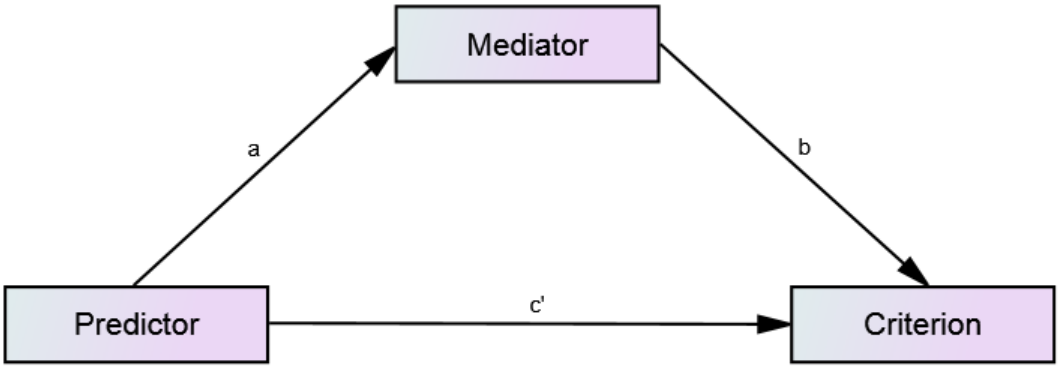

Figure 8. Generic mediation model.

Model 14: Sexual trauma, PTSS, RSBs, and adverse health outcomes. This model consists of the predictor latent variable, *sexual trauma*, two potential mediating variables, *PTSS severity* and *risky sexual behaviours (RSBs)*, and a criterion variable, *adverse health outcomes*. The structure of the latent variables were the same as those outlined above.

First, the overall fit of the model was established, and then three possible mediation pathways were tested. The full model fit the data well, $\chi^2/df = 2.58$, $p < .001$, CFI = .96, TLI = .94, RMSEA = .06 (90% C.I. = .05 .07). All indicator loadings were significant at the $p < .001$, as were most of the path coefficients. Exceptions include nonsignificant paths from PTSS severity to RSBs and RSBs to adverse health outcomes. The latter of these two is not surprising, as this path was nonsignificant in the respective direct effects model. See Figure 9 for the full model, path coefficients, and variances.

Mediation pathway 1: PTSS severity as a mediator of the relation between sexual trauma and adverse health outcomes. This indirect pathway was tested and determined to be a case of partial mediation. Two models were compared, one with the path from sexual trauma to health outcomes constrained to zero (Model 14a) and one where this path was left to vary (Model 14). The χ^2_{DIF} test comparing these two models was significant, $\chi^2_{DIF} = 5.70$, $p = .02$, indicating that the model fit is improved by the inclusion of the direct pathway. Nevertheless, a Sobel test examining the indirect effect was significant, $z = 4.75$, $p < .001$, with 53% of the total effect mediated through PTSS severity.

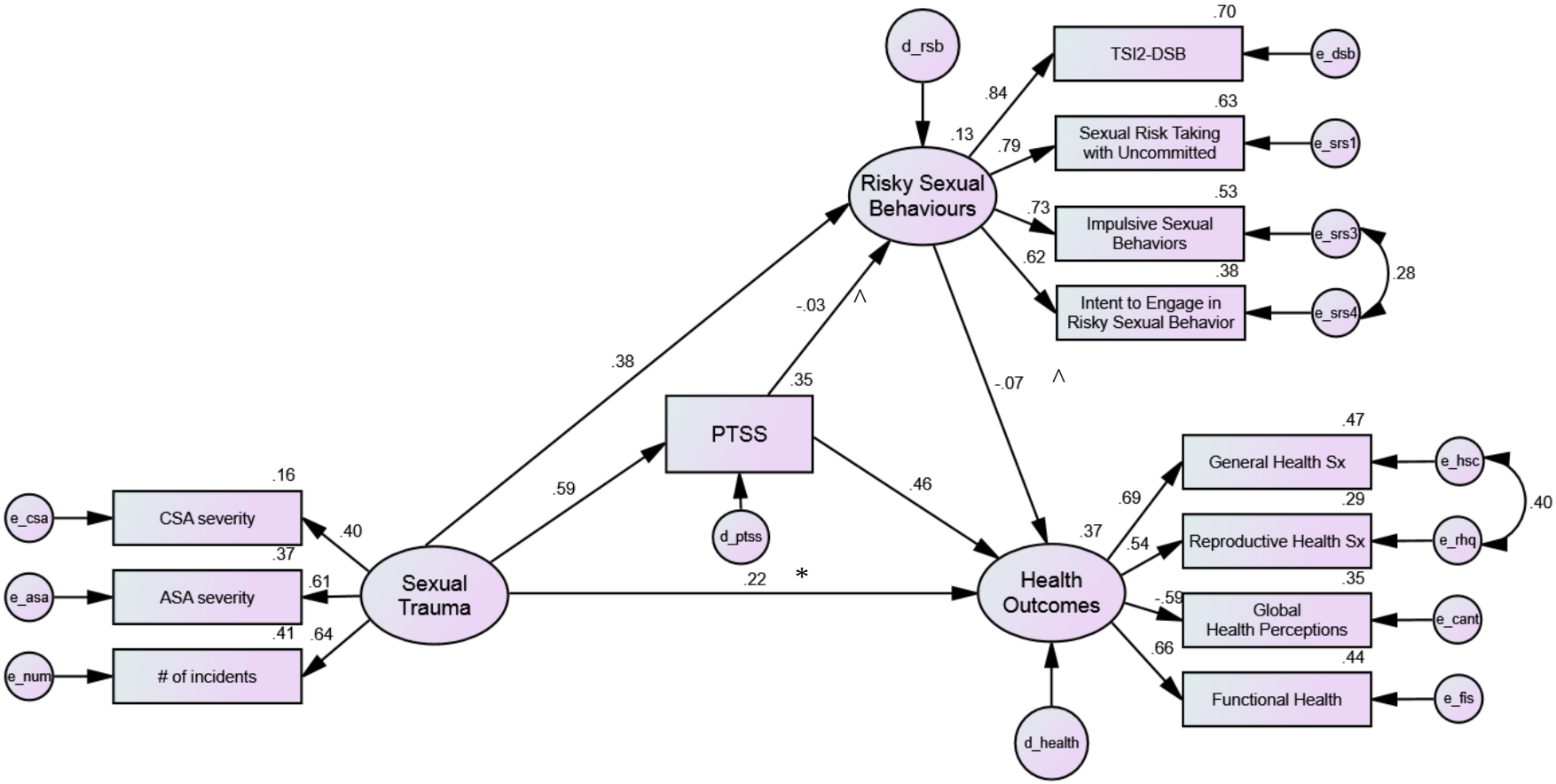

Figure 9. Model 14: SEM model with sexual trauma, PTSS, RSBs, and adverse health outcomes.
Note: all paths free-to-vary; all path coefficients are significant at $p < .001$ unless otherwise indicated by ^; * $p < .05$.

Mediation pathway 2: PTSS severity as a mediator of the relation between sexual trauma and RSBs. While the path from sexual trauma to PTSS was strong and significant, the second component of this indirect effect, the path from PTSS severity to RSBs was nonsignificant (β = -.004, *ns)*; thus, the criteria for mediation are not met, and the indirect effect is not significant.

Mediation pathway 3: RSBs as a mediator of the relation between PTSS and adverse health outcomes. This mediation pathway was not tested as there was no significant association between the mediator (RSBs) and the criterion variable (adverse health outcomes).

Model 15: Nonsexual trauma, PTSS, RSBs, and adverse health outcomes. This model consists of the predictor latent variable, *nonsexual trauma*, two potential mediating variables, *PTSS severity* and *risky sexual behaviours (RSBs)*, and a criterion variable, *adverse health outcomes*. Again, the indicators for the latent variables were the same as those outlined above.

Fit statistics indicated that the overall model was a good fit, $\chi^2/df = 2.59$, $p < .001$, CFI = .95, TLI = .94, RMSEA = .06 (90% C.I. = .05 .07). All indicators loaded significantly onto their respective latent variables and most path coefficients were significant at the $p < .001$. Nonsignificant paths included that between nonsexual trauma and RSBs (β = .02, *ns*), which is most likely due to the inclusion of a mediated pathway, as well as the relation between RSBs and adverse health outcomes (β = - .02, *ns*). See Figure 10 for the full model, path coefficients, and variances.

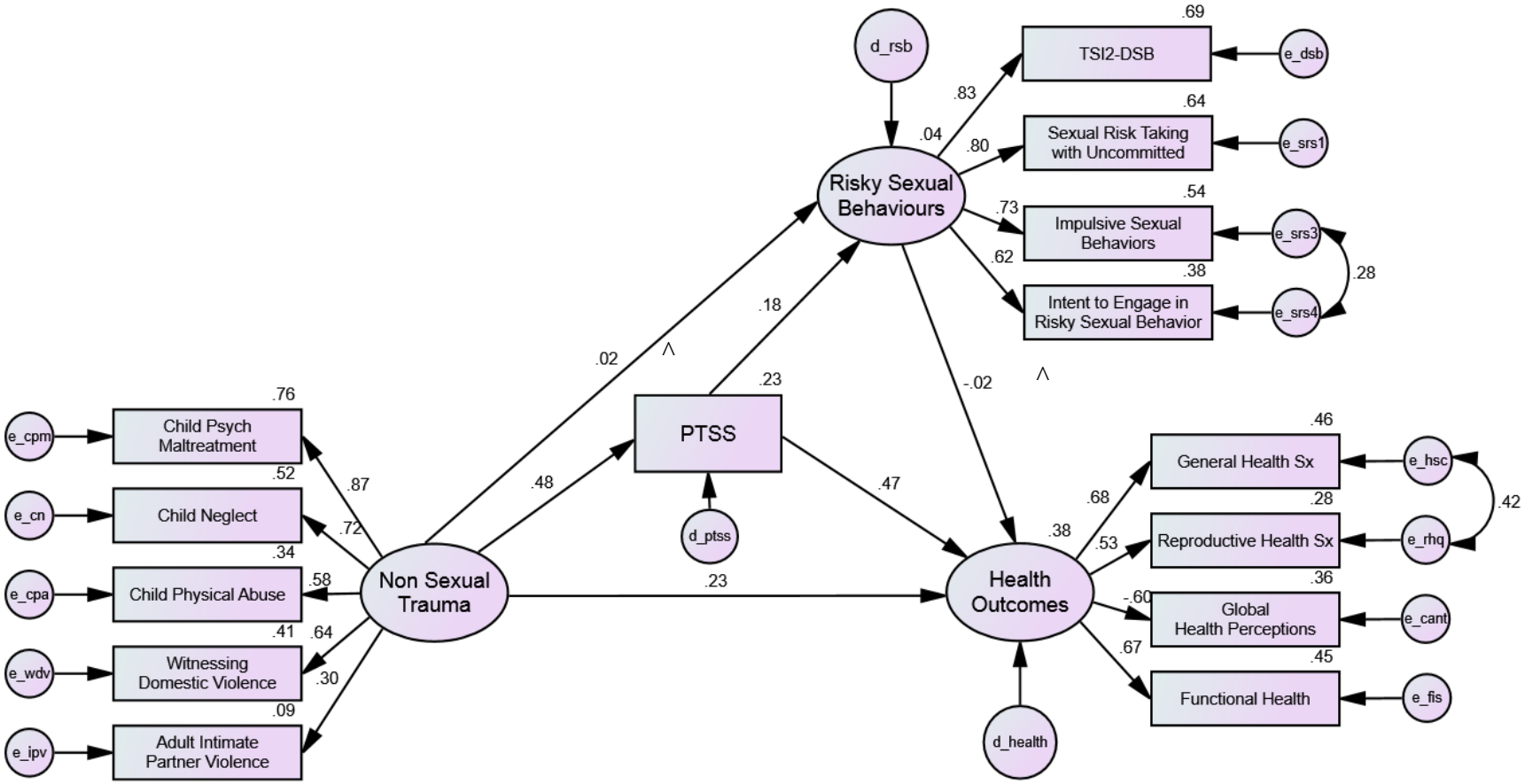

Figure 10. Model 15: SEM model with nonsexual trauma, PTSS, RSBs, and adverse health outcomes.
Note: all paths free-to-vary; all path coefficients are significant at $p < .001$ unless otherwise indicated by ^.

Mediation pathway 4: PTSS severity as a mediator of the relation between nonsexual trauma and adverse health outcomes. The indirect pathway through PTSS severity was assessed and found to be significant; however, the χ^2_{DIF} test comparing a free-to-vary model (Model 15) with one where the direct path from nonsexual trauma to health outcomes constrained to zero (Model 15a) was significant, $\chi^2_{DIF} = 14.74$, $p < .001$, indicating that the model fit was significantly improved by the inclusion of the direct pathway. Partial mediation was confirmed by a Sobel test, $z = 6.08$, $p < .001$, indicating that the indirect effect through PTSS severity was reliable and significant. Forty nine percent of the total effect was determined to be mediated through PTSS severity.

Mediation pathway 5: PTSS severity as a mediator of the relation between nonsexual trauma and RSBs. The indirect pathway through PTSS severity was tested and found to be significant, while the direct path from nonsexual trauma to RSBs was not significantly different than zero in the presence of the mediator. Furthermore, model comparison, $\chi^2_{DIF} = .11$, *ns*, indicated that no improvement in model fit resulted from the inclusion of a freely varying direct path between nonsexual trauma and RSBs. Thus, it was determined that PTSS severity served as a mediator between nonsexual trauma and risky sexual behaviours.[2]

Mediation pathway 6: RSBs as a mediator of the relation between PTSS and adverse health outcomes, in the context of nonsexual trauma. Similar to above, this

[2] This would be considered by some (e.g., Mathieu & Taylor, 2006) to be an indirect effect rather than a mediated pathway, given that the direct effect from nonsexual trauma to RSBs was not significant in the direct effects model (Model 7). However, more recent literature (e.g., Hayes, 2009) suggests that the terms "indirect effect" and "mediation" can be used interchangeably, for reasons beyond the scope of this dissertation. Accordingly, this pathway will be referred to as mediation in the present context with the acknowledgement that some would consider this an indirect effect.

mediation pathway was not tested as there was no significant relation between the mediator (RSBs) and the criterion variable (adverse health outcomes).

Model 16: Sexual trauma, PTSS, substance use, and adverse health outcomes. This model consists of the predictor latent variable, *sexual trauma*, two potential mediating variables, *PTSS severity* and *substance use*, and a criterion variable, *adverse health outcomes*. The indicators for the latent variables are the same as those outlined above.

The overall model was a good fit to the data, $\chi^2/df = 2.68$, $p < .001$, CFI = .95, TLI = .93, RMSEA = .06 (90% C.I. = .05 .07). All indicators loaded significantly onto their respective latent variables and most path coefficients were significant at the $p < .001$. Nonsignificant paths included those between PTSS and substance use ($\beta = .09$, *ns*), and between substance use and adverse health outcomes ($\beta = -.01$, *ns*). See Figure 11 for the full model, path coefficients, and variances. Please note the mediation pathway between sexual trauma and adverse health outcomes has already been tested and described under Model 14.

Mediation pathway 7: PTSS severity as a mediator of the relation between sexual trauma and substance use. In the direct effects models, both the paths from sexual trauma to PTSS (path *a*; $\beta = .59$, $p < .001$) and from PTSS to substance use (path *a*; $\beta = .32$, $p < .001$) were significant. However, in the presence of the predictor variable (i.e., sexual trauma), the path from PTSS to substance use fell to nonsignificance ($\beta = .09$); indicating a nonsignificant indirect effect.

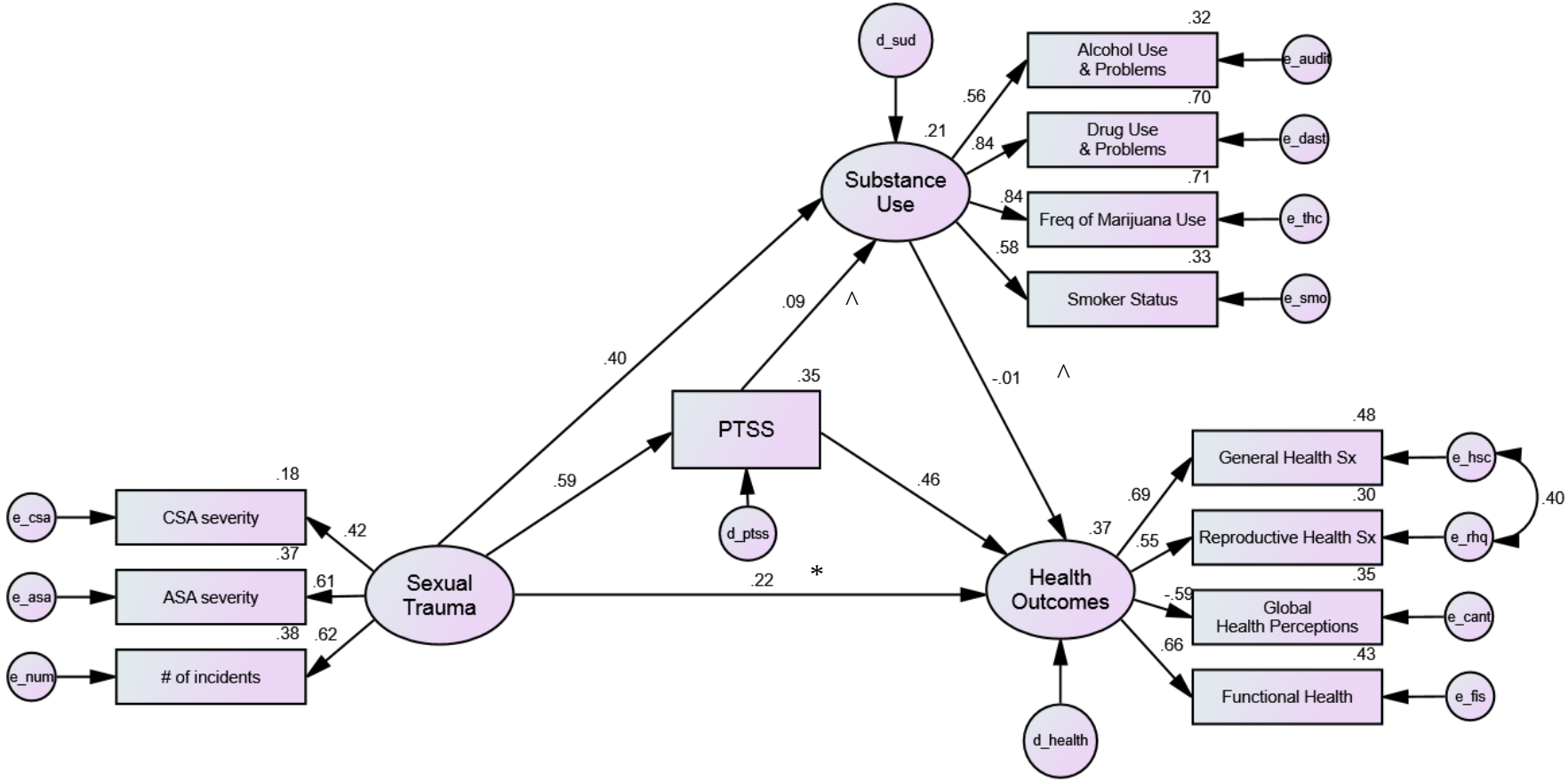

Figure 11. Model 16: SEM model with sexual trauma, PTSS, substance use, and adverse health outcomes.
Note: all paths free-to-vary; all path coefficients are significant at $p < .001$ unless otherwise indicated by ^; * $p < .05$.

Mediation pathway 8: Substance use as a mediator of the relation between PTSS severity and adverse health outcomes. This mediation pathway was not tested as there was no significant association between the hypothesized predictor (PTSS severity) and mediator (substance use), nor was there a significant relation between the hypothesized mediator (substance use) and the criterion variable (adverse health outcomes), in the context of the other components of the mediation model.

Model 17: Nonsexual trauma, PTSS, substance use, and adverse health outcomes. This final model consists of the predictor latent variable, *nonsexual trauma*, two potential mediating variables, *PTSS severity* and *substance use*, and a criterion variable, *adverse health outcomes*. The indicators for the latent variables are the same as those outlined above.

The overall model was an adequate fit to the data, $\chi^2/df = 2.67$, $p < .001$, CFI = .94, TLI = .93, RMSEA = .06 (90% C.I. = .05 .07). All indicators loaded onto their respective latent variables at a level of at the $p < .001$, as did all but two regression paths. Nonsignificant paths included those between substance use and adverse health outcomes ($\beta = .03$, *ns*), and the direct path between nonsexual trauma and substance use ($\beta = .07$, *ns*); although the nonsignificance of the latter path is likely due to the inclusion of the hypothesized mediator, PTSS severity. See Figure 12 for the full model, path coefficients, and variances. Please note the mediation pathway between nonsexual trauma and adverse health outcomes has already been tested and described under Model 15.

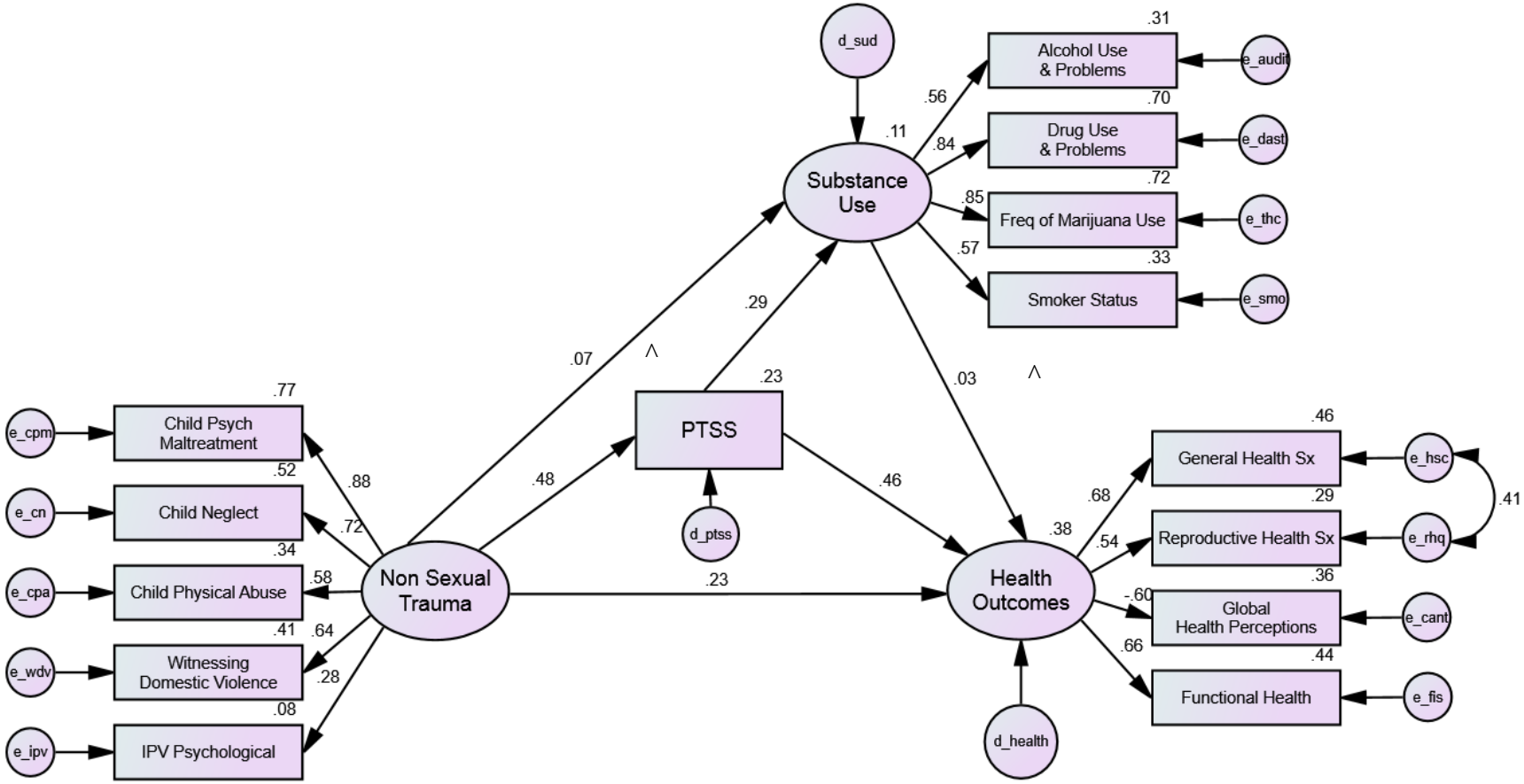

Figure 12. Model 17: SEM model with nonsexual trauma, PTSS, substance use, and adverse health outcomes.
Note: all paths free-to-vary; all path coefficients are significant at $p < .001$ unless otherwise indicated by ^; * $p < .05$.

Mediation pathway 9: PTSS severity as a mediator of the relation between nonsexual trauma and substance use. This indirect pathway was assessed and found to be significant, with significant indirect paths and 11% of the variance in substance use accounted for. Furthermore, the direct path from nonsexual trauma to substance use, which was originally significant, became nonsignificant in the presence of the mediator. Finally, a nonsignificant χ^2 difference test ($\chi^2_{DIF} = 1.33$, $p = .25$) indicated that the the free-to-vary model (Model 17) showed no advantage in terms of fit over the mediated model (Model 17b) with the direct path constrained to zero. Thus, PTSS severity was found to fully mediate the pathway from nonsexual trauma to substance use.

Mediation pathway 10: Substance use as a mediator of the relation between PTSS severity and adverse health outcomes. Again, this mediation pathway was not tested as the path from the hypothesized mediator (substance use) to the criterion (adverse health outcomes) was nonsignificant in the presence of the predictor variable, PTSS severity.

Discussion

The current study examined relations among interpersonal trauma, posttraumatic stress symptoms (PTSS), health risk behaviours in the form of risky sexual behaviours and substance use, and adverse health outcomes in a sample of women currently attending university. Using structural equation modelling (SEM), histories of both sexual traumas and nonsexual interpersonal traumas were associated with greater PTSS severity, and worse physical health outcomes, including more general health symptoms, greater sexual and reproductive health concerns, higher levels of health-related functional impairment, and worse overall self-perceptions of health. PTSS severity was also found to mediate health risk behaviour outcomes, specifically risky sexual behaviours and substance use behaviours, in the context of nonsexual interpersonal trauma histories. Severity of sexual trauma histories (i.e., sexual abuse/assault in childhood, adolescence or adulthood) was associated with the same health risk behaviours – substance use and risky sexual behaviours; however, PTSS severity did not mediate these pathways. Similarly, pathways from risky sexual behaviours and substance use to physical health outcomes were nonsignificant in the presence of pathways from interpersonal trauma and PTSS severity to health outcomes. Consequently, these behavioural constructs were not shown to mediate physical health outcomes in this sample of young adult university women. Results are discussed in the context of relevant existing literature with suggestions for future research to expand and clarify the present findings.

Prevalence Rates

The rates of interpersonal trauma exposure in the present sample are specific to trauma type and generally range from 10% to 47%, which is in keeping with much of the

research conducted with both female university students (Edwards, Desai, Gidycz, & VanWynsberghe, 2009; Graves, Sechrist, White, & Paradise, 2005; Koss et al., 1987; Runtz & Roche, 1999; Tansill et al., 2012; Van Bruggen et al., 2006; Vrana & Lauterbach, 1994) and community samples (Edwards, Holden, Felitti, & Anda, 2003; Felitti et al., 1998; Scher, Forde, McQuaid, & Stein, 2004; Spertus et al., 2003). Specific prevalence rates for each trauma type are discussed.

Child sexual abuse (CSA). Information was gathered on CSA experiences involving only physical contact and experiences including non-contact CSA (e.g., a perpetrator exposing his or her genitals to the child). The prevalence for contact CSA in the present sample was 12%, while almost 19% of the women in this sample reported any form of CSA, including non-contact abuse experiences. These rates are similar to what is found in the literature on nonclinical samples. Specifically, two published meta-analyses (Pereda, Guilera, Forns, & Gomez-Benito, 2009; Stoltenborgh, van IJzendoorn, Euser, & Bakermans-Kranenburg, 2011) looked at CSA prevalence rates across international samples, including both student and community samples, published between 1980 and 2008, and considered a variety of factors in the definitions of CSA (e.g., age at time of abuse, contact only vs. non-contact forms of CSA, etc.). Across all studies reviewed, Pereda et al. and Stoltenborgh et al. found mean CSA rates for women of 19.2% and 18%, respectively. However, Pereda and colleagues noted that rates differed somewhat within student samples (13.9%), when a younger cutoff age for childhood was used (17.6% for age 14 and under), when a contact only definition was used (13.7%), and among North American samples (15.8%). The authors of both meta-analyses note that there is significant methodological variability in how CSA is defined in research and no

internationally recognized standard for assessing CSA. This issue, in itself, can result in a considerable variability among prevalence rates and correlates of abuse (Briere, 1992; Pereda et al., 2009; Stoltenborgh et al., 2011). The CSA rates found in the present study are relatively consistent with existing literature, particularly when sample type and the parameters of the definition of CSA are taken into account. Other relevant factors that may have contributed to a slightly lower rate than some studies include the focus in measurement items on non-consensual experiences, a specification that often is not included in measures of CSA. Furthermore, the relatively high functioning nature of the university population from which this sample was drawn, which may be indicative of a lower CSA risk in these women's childhoods, or a decreased likelihood of experiencing severe CSA as compared to women who do not progress to postsecondary education.

Child psychological maltreatment (CPM). As discussed previously, CPM, along with other experiences described below, are measured along a continuous scale and are not easily dichotomized into 'abuse' or 'no abuse' categories. Nevertheless, participants with scores above one standard deviation from the sample mean were designated as having elevated levels of CPM. In the present sample, 16.8% of women reported elevated levels of child psychological maltreatment. This is comparable to rates of moderate to severe CPM (i.e., 14% to 16%) reported in undergraduate samples (Finzi-Dottan & Karu, 2006; Van Bruggen, 2009) and community samples (Baker & Festinger, 2011; Edwards et al., 2003; Scher et al., 2004), but somewhat lower than rates of 23% (Edwards et al., 2009) and 38% (Paivio & Cramer, 2004) found in other student samples. The discrepancy between the present sample and the latter two studies is most likely due to the use of a higher threshold to determine elevated levels of CPM in the current study.

Both Edwards and colleagues as well as Paivio and Cramer used the Childhood Trauma Questionnaire (Bernstein & Fink, 1998) to measure CPM in their study. Continuous scores on this scale can be grouped into four categories: none/minimal, low/moderate, moderate/severe, and severe/extreme and all participants whose scores fell from "low" to "extreme" were considered to have experienced CPM. A further method of placing the current sample's experiences in context is by comparing the sample mean score on the Psychological Abuse subscale of the PMR (26.4) to that reported by the scale's authors in a similar sample of female university students (27.3; Briere et al., 2012; M. Runtz, personal communication, November 25, 2013).

Child psychological neglect (CN). Calculated in the same manner as for CPM, 14.9% of the current sample reported elevated levels (i.e., one standard deviation or more above the sample mean) of psychological neglect in childhood. Fewer studies have examined and reported on this form of interpersonal trauma compared to others. Nevertheless, the rate in the current sample remains comparable to that found in a recent community sample (16.6%; Baker & Festinger, 2011) and in a sample of female primary care patients (11.2%; Spertus et al., 2003), based on definitions and assessment methods similar to those used in the present study. In contrast, two studies with Canadian university students (Paivio & Cramer, 2004; Paivio & McCulloch, 2004) found that 38% of the women in their samples reported emotional neglect by their parents; however, these researchers used a lower threshold in order to capture experiences of "mild neglect." Comparing the mean from Psychological Neglect subscale in the current sample (20.05) to that from the validation study for the PMR (18.9; Briere et al., 2012;

M. Runtz, personal communication, November 25, 2013), supports that ratings for psychological neglect experiences in this sample are close to expected levels.

Child physical abuse (CPA). The definition of CPA used in this study includes experiences of physical harm (e.g., hitting, kicking, or beating) and threats to the child's life occurring at a frequency of once a year or greater prior to the age of 18. Accordingly, physical abuse in childhood was reported by 23.8% of the current sample which is relatively consistent with other published findings in college or university samples which tend to range from 21% to 25% (Edwards et al., 2009; Messman-Moore, Walsh, & DiLillo, 2010; Paivio & McCulloch, 2004; Runtz & Roche, 1999). Furthermore, this rate is also similar to the prevalence of CPA reported in various community samples across North America (Briere & Elliott, 2003; Edwards et al., 2003; MacMillan et al., 1997).

Witnessing Domestic Violence (WDV). Returning to the method used for CPM and CN, 14.5% of women in this study reported exposure to elevated levels (i.e., those at or above one standard deviation above the mean) of domestic violence between their parents or parental figures, including both psychological aggression and physical violence. This is less than Carlson's (2000) estimate that up to one third of the US population has been exposed, during childhood or adolescence, to violence between their parental figures. It is similarly below the range of 20% to 40% identified by Evans, Davies, and DiLillo (2008) in their review of the literature on exposure to domestic violence. Again, these estimates and reported ranges are based on *any* exposure, rather than elevated levels of exposure to violence. The proportion of the present sample exposed to elevated levels of parental domestic violence is similar to that found in another university sample assessing WDV in a similar way (16%; Van Bruggen, 2009),

as well as the proportion of women who witnessed violence against their mothers in the Adverse Childhood Experiences Study (14%; Edwards et al., 2003).

Intimate Partner Violence (IPV). In their own romantic relationships, 13.7% of women reported elevated levels of IPV (i.e., one standard deviation above the sample mean on a scale measuring both psychological and physical violence directed toward them by a relationship partner). A slightly smaller portion (11%) identified physical violence in their relationships at a frequency of once a year or greater. While the rate of physical IPV is comparable to that found in student (Edwards et al., 2009) and community samples (Spiwak, Afifi, Halli, Garcia-Moreno, & Sareen, 2013), typical rates of all IPV, including both physical and psychological aggression are often closer to 20% to 30%, with psychological aggression reported more often than physical violence (Acevedo, Lowe, Griffin, & Botvin, 2013; Bauer et al., 2002; Edwards et al., 2009; Elliott & Briere, 2003; Hines & Saudino, 2003; Perry & Fromuth, 2005; Tjaden & Thoennes, 2000). Again, this discrepancy may be due to the higher threshold used in the present study identifying only *elevated* levels of IPV. Recall that 41.3% of women in this sample reported psychological IPV occurring at some point thus far in their lifetime. This hypothesis is supported by a recent study using data from the National Longitudinal Study of Adolescent Health (Nowotny & Graves, 2013). Nowotny and Graves found that while 27.5% of women reported some form of IPV in early young adulthood (approximate age range of 18 to 24), that proportion decreased to 13.1% when the authors looked specifically at an elevated level of more severe IPV.

Adolescent and adult sexual assault (ASA). Rates of ASA can vary considerably based on the specific experiences included under the category of sexual

assault. The most inclusive definition considers all forms of sexual assault and attempted assault, with 57.7% of the current sample reporting past experiences in this category. Including only coerced sex and rape (while excluding attempted assaults and unwanted sexual touching), the prevalence rate drops to just under 33% of this sample reporting non-consensual sex. However, it is important to note that both unwanted sexual contact and attempted assaults are still considered offences under the Canadian Criminal Code (Department of Justice Canada, 2013). While it may be surprising, even the more inclusive rate (57.7%) is relatively consistent with existing literature, particularly studies employing the same assessment method and the same definition of ASA in college or university samples. In Koss, Gidycz, and Wisniewski's (1987) landmark study on ASA prevalence rates in university students, 54% of the women sampled reported a sexual assault experience. Similarly, Ullman, Karabatsos, and Koss (1999) found that just over 54% of their sample of university women reported some form of ASA. More recently, two studies with female undergraduates found that 56% (Johnson & Johnson, 2013) and 60% (Cleere & Lynn, 2013) of women in their samples endorsed some form of sexual victimization. Finally, these rates are consistent with Lloyd and Emery's (2000) report that 45% to 75% of women will experience some form of sexual victimization in their lifetime.

Where prevalence rates in the current sample differ from some of the literature is in the examination of specific assault categories, primarily that of rape. Most studies that assess ASA using the same measure (or an earlier version) as that used in the present study report prevalence rates for the *most severe* form of sexual assault experienced by a given participant; therefore, if a woman experiences both unwanted sexual contact and

rape, her experience is counted as part of the prevalence rate for rape, but not unwanted sexual contact. All inclusive, overlapping prevalence rates for each form of ASA are presented in the Results section, but are not discussed here due to a scarcity of comparison studies reporting ASA prevalence rates in this manner.

In the current sample, rates of unwanted sexual contact (10.5%) and sexual coercion (8.5% including both attempted and completed coerced sex) are similar to, although slightly lower than, what is typically reported in the literature (Cleere & Lynn, 2013; Edwards et al., 2009; Koss et al., 1987). Other researchers (Cleere & Lynn, 2013; Koss et al., 1987) have found that about 12% of female university student report attempted rape as their most severe form of victimization, which is consistent with the rate of 11.2% in the present study. A discrepancy arises, however, with the prevalence of completed rape in the current sample (27.6%) as compared to typical rates in university samples ranging from 15% to 20% (Cleere & Lynn, 2013; Eadie et al., 2008; Edwards et al., 2009; Koss et al., 1987; Littleton, Axsom, Breitkopf, & Berenson, 2006; Messman-Moore, Walsh, & DiLillo, 2010). While Johnson and Johnson (2013) found that 31.4% of their female student sample reported rape experiences, they included childhood rape in this category, which may have partially contributed to an elevated prevalence rate.

There are a few reasons why the prevalence of rape may be higher than expected in the present sample. Few studies, even among those published in the past year, have used the newest version of the Sexual Experiences Survey (SES; Koss et al., 2007) employed in the current study. The revised SES differs in several important ways from the original SES (Koss & Gidycz, 1985). First, the updated SES changed the use of gendered language in the original (e.g., “has a man ever….”) to minimize any bias toward

heterosexual sexual experiences. Consequently, the revised SES may be capturing a greater proportion of non-consensual same sex experiences than the original measure. Second, the authors chose to dedicate a specific item to non-consensual oral sex, which was originally referred to as a "sex act" and grouped in with non-consensual anal intercourse. This alteration may have significant implications for the categorization of experiences as rape, and associated prevalence rates. Many methods of assessing ASA do not specifically ask about oral sex, instead asking about "forced sex" or "forced intercourse" (e.g., Golding, 1994; Silverman et al., 2001) requiring the participant to decide whether or not to report non-consensual oral sex as such. Furthermore, oral sex is increasingly seen by younger cohorts as more casual and less intimate than intercourse (Lewis, Granato, Blayney, Lostutter, & Kilmer, 2012; Vannier & Byers, 2013), perhaps making it less likely that participants will self-identify these experiences as "rape" or "forced sex."

Finally, the updated SES contains more inclusive language addressing the absence of consent due to intoxication. Specifically, the 2007 version asks for each victimization experience, whether it occurred as the result of someone "…taking advantage of me when I was too drunk or out of it to stop what was happening" as compared to the original 1985 wording of an experience occurring "…because a man gave you alcohol or drugs." As a result, the newer version of the SES is more likely to capture and label non-consensual sex due to intoxication as rape than the original SES or other assessment methods that do not specifically ask about intoxication or sex after the use of drugs or alcohol. Notably, up to 75% of rapes involving college and university students are associated with substance use (Mohler-Kuo, Dowdall, Koss, & Wechsler, 2004), yet experiences

involving a lack of consent due to intoxication are far less likely to be acknowledged by survivors as rape experiences (Kahn, Jackson, Kully, Badger, & Halvorsen, 2003; Layman et al., 1996).

Posttraumatic stress disorder (PTSD). By rating their symptoms as moderately distressing or higher on the PTSD Checklist (PCL-C; Weathers et al., 1993), 18.3% of women in this sample were considered to meet symptom criteria for a probable diagnosis of PTSD. This proportion is greater than PTSD prevalence rates of 9-14% typically reported among women in both university samples (Elhai et al., 2012; Gauci & MacDonald, 2012; Read et al., 2011; Ruggiero et al., 2003; Schaaf & McCanne, 1998) and community or epidemiological samples (Breslau et al., 1991; Breslau, Davis, Peterson, & Schultz, 1997; Kessler et al., 1995; Resnick et al., 1993). One recent study (Stappenbeck et al., 2013) found that 17.1% of their sample of college women were classified as having met criteria for PTSD. However, for the purposes of their study, these authors specifically selected a sample with higher levels of trauma exposure (88% compared to 75% in Read et al.'s sample of college women), which may have contributed to a higher rate of PTSD among their participants. Similarly, the mean symptom severity score on the PCL-C was higher in the present study (37.3) than that found in student samples using the same measure. For example, Rutter and colleagues (2013) reported a mean of 28.6 in their sample of 200 male and female undergraduate students and Ruggiero et al. (2003) found a mean score of 29.4 in a sample of 392 college students, again both male and female. It is important to consider that neither of these studies reported separate means for female students only, which are typically higher than among males (Read et al., 2011; Tolin & Foa, 2006). In contrast, Flood, McDevitt-Murphy,

Weathers, Eakin, and Benson (2009) reported a mean symptom severity score on the PCL of 40.4 in their slightly smaller sample of 114 undergraduates; however these participants were selected to have experienced at least one potentially traumatic event in their lifetime, and may have endorsed higher symptom ratings as a result.

There are several potential explanations for a higher than expected rate of PTSD probable diagnosis in the present sample. First, the PCL-C is a self-report screening measure, which is not meant to be used to make conclusive diagnoses. The checklist only assesses symptom ratings, rather than all *DSM-IV-TR* (APA, 2000) diagnostic criteria. This excludes criteria A1 (i.e., the traumatic event involved "actual or threatened death or serious injury, or a threat to the physical integrity of self or others," p. 467) and A2 (i.e., the individual responded with "intense fear, helplessness, or horror," p. 467), both of which relate to the traumatic event itself. Criterion E requiring that symptoms have lasted for more than 1 month, and criterion F, which specifies that symptoms must have caused clinically significant impairment are also excluded from the PCL-C. Perhaps the most relevant of these is the impairment criterion, which when assessed and considered, often results in a lower rate of diagnosable PTSD (Elhai et al., 2012). Similarly, participants self-selected the traumatic experience for which they provided symptom ratings, which does not ensure that the A1 and A2 criteria were met. Participants who specified upsetting experiences that would not have met the A1 criterion were removed from the portion of the sample classified as having met criteria for a probable diagnosis PTSD; however, criterion A2 was not assessed in this study. Another potential contributing factor to the rate of probable PTSD in the current sample is the nature of the traumas on which symptom ratings were provided. Participants were

specifically asked to provide symptom ratings for interpersonal trauma experiences, which have been found to elicit more severe PTS symptoms and higher rates of PTSD diagnosis than other types of trauma (Kessler et al., 1995; Kilpatrick & Resnick, 1993; Tolin & Foa, 2006). Furthermore, it is possible that participants were primed to recall specific PTS symptoms by the completion of interpersonal trauma measures immediately prior to providing their responses to PCL-C items. Despite some disadvantages in terms of establishing a reliable PTSD diagnosis, the PCL-C is a widely-used research tool with excellent psychometric properties. It is best used to assess PTSS severity, which was the variable of interest in the present study, and thus it was selected for this purpose.

Finally, it is important to note that the *DSM-IV-TR* criteria, which were in place at the time of the study's design and throughout the collection of data, were used as a basis of assessing and establishing probable PTSD diagnosis in this study. Prevalence rates are likely to vary slightly if established according to the newer *DSM-5* criteria. For example, one recent study comparing the two sets of criteria found that PTSD prevalence was slightly higher using the *DSM-5* criteria as compared to *DSM-IV* in a sample of college students (Elhai et al., 2012).

Overall, the prevalence rates for interpersonal trauma types and probable PTSD found in this study are relatively consistent with existing literature, with a few exceptions, providing support for the generalizability of these results to the population from which the present sample was drawn.

Interpersonal Trauma, PTSS Severity, and Adverse Health Outcomes

As expected, the results of this study showed strong and significant associations linking severity of both sexual (i.e., sexual abuse/assault in childhood, adolescence, or

adulthood) and nonsexual interpersonal trauma (i.e., childhood psychological abuse and neglect, child physical abuse, witnessing domestic violence in childhood, and intimate partner violence in adolescence and adulthood) experiences to severity of posttraumatic stress symptoms (PTSS). Similarly, both sexual and nonsexual trauma severity were associated with physical health outcomes, including general physical symptoms, sexual and reproductive health concerns, health-related functional impairment, and overall health perceptions. Specifically, this study found that, overall, the more severe a woman's interpersonal trauma experience, the greater the severity of her PTS symptoms and her self-reported physical health problems. These findings contribute to the growing body of literature documenting the physical and psychological sequelea of interpersonal trauma (e.g., Bohn & Holz, 1996; Briere & Elliott, 1994; Campbell, 2002; Cloitre, Cohen, Edelman, & Han, 2001; DeMaris & Kaukinen, 2005; Golding, 1996; Hussey, Chang, & Kotch, 2006; Maniglio, 2009; Mathew, Smith, Marsh, & Houry, 2013; Moeller, Backmann, & Moeller, 1993; Resnick, Acierno, & Kilpatrick, 1997; Runtz, 2002; Spertus et al., 2003; Wadsworth & Records, 2013).

In addition, PTSS severity was strongly and significantly associated with physical health outcomes ($\beta = .58$), such that women with more severe posttraumatic stress symptoms have more frequent general and reproductive health symptoms, greater health-related functional impairment, and worse perceptions of their overall health. This is consistent with existing reports in the literature on the link between PTSS/PTSD and health (Clum, Calhoun, & Kimerling, 2000; Green & Kimerling, 2004; Haagsma et al., 2012; Kimerling et al., 2002; Schnurr & Jankowski, 1999; Zoellner, Goodwin, & Foa, 2000). There are many possible explanations for this association, some of which are

discussed below, but nevertheless, there are evident risks to a woman's physical health when she is, or has, suffered from posttraumatic stress symptoms.

The first two mediation models revealed that PTSS severity partially mediated the direct associations between sexual trauma and physical health problems, and between nonsexual interpersonal trauma and adverse health outcomes. In both cases, the mediated pathway through PTSS severity accounted for about half of the total effect (53% and 49%, respectively). This contributes to and extends findings from studies investigating the role of PTSS/PTSD as a mediator of the link between trauma and health in other populations (Friedman & Schnurr, 1995; Kimerling, Clum, & Wolfe, 2000; Wachen et al., 2013; Wagner, Wolfe, Rotnitsky, Proctor, & Erickson, 2000), and is consistent with literature examining similar models in the context of interpersonal trauma (Eadie et al., 2008; Resnick et al., 1997; Smith et al., 2011). Furthermore, these findings provide further support for the theory that, in the aftermath of interpersonal trauma, it is the process of developing and sustaining significant psychological distress, and particularly posttraumatic stress, which places a woman at increased risk of developing physical symptoms and conditions, viewing her overall health as poorer, and experiencing functional impairments related to her health. This suggests that the response that occurs in the aftermath of the trauma – both within the individual and in their environment – likely has a greater impact on an individual's physical health status, than exposure to the trauma itself.

Schnurr and Green (2004), among others, argue that partial mediation is to be expected when investigating any specific mediator of the relation between trauma and physical health. This is because the mechanisms linking trauma with physical health are

multifaceted and complex, allowing for several different constructs to play a role in explaining this association. In fact, given the potential complexity of any given individual existing in sociocultural and relational contexts, the vast array of trauma outcomes, and the multifaceted nature of physical health, it may be entirely unlikely that *any* construct would fully and reliably mediate this association. Nevertheless, by accounting for approximately half of the total association linking sexual and nonsexual interpersonal traumas to physical health outcomes, PTSS severity remains as a key mediator of this relation. This is consistent with Schnurr and Green's assertion that PTSS/PTSD is "the primary pathway through which trauma leads to poor health" (2004, p. 249), indicating that there may be something specific about posttraumatic stress that leads to compromised physical health.

Tansill and colleagues (2012) addressed the issue of partial versus full mediation in their study of sexual victimization and physical health in female university students. They found support for a fully mediated model when they included a range of trauma-related symptoms (i.e., dissociative, anxious, depressive, and sexual symptoms in addition to PTSS) as their mediator. A similar result was found by Runtz and Godbout (2012) when they included dissociation, anxiety, and PTSS in their latent variable mediator. Therefore, it is possible that traditional PTS symptoms (i.e., re-experiencing, avoidance, numbing, and hyperarousal) account for a considerable portion, but not all, of the link between trauma and health, and that an additional portion of this effect is accounted for by other trauma-related psychological symptoms such as dissociation, anxiety, and/or depression.

Furthermore, numerous environmental and contextual factors are likely to play a role in the association between PTSS and physical health outcomes. For example, social support has been shown to mediate long-term outcomes of childhood maltreatment (Sperry & Spatz Widom, 2013), while other research has identified social support as a moderating variable, potentially protecting interpersonal trauma survivors from negative health outcomes (e.g., Johnson & Johnson, 2013; Kimerling & Calhoun, 1994). Similarly, access to appropriate and effective health care has been associated with improved health outcomes in female trauma survivors (e.g., Weissbeck & Clark, 2007); although access to care has been understudied in populations of interpersonal trauma survivors (Schacht, Pandiani, & Banks, 2007). These and other findings suggest that the association between interpersonal trauma and health may be best explained by a more complex arrangement of mediating and moderating variables, operating at various levels within the individual and in her broader environment. Future investigations that examine the various contributing and interacting effects of both broad and specific factors may help to elucidate some of these more complex relationships.

Interpersonal Trauma, PTSS Severity, and Health Risk Behaviours

The next set of hypotheses proposed links between interpersonal trauma and the two sets of health risk behaviours examined in this study, risky sexual behaviours (RSBs) and substance use behaviours. Findings showed that as the severity of women's sexual trauma experiences increased, so did their levels of sexual risk-taking behaviour. Similar associations have been documented in the literature (Brener et al., 1999; Gidycz et al., 2008; Gilbert et al., 2009; Johnson & Johnson, 2013; Messman-Moore, Walsh, & DiLillo, 2010; Silverman et al., 2001; Van Bruggen et al., 2006); although this is the first

time this link has been demonstrated with such a comprehensive assessment of sexual risk-taking. Typically, risky sexual behaviours are assessed by single items, often with unknown validity (e.g., Brener et al., 1995; Silverman et al., 2001), with results reporting simple, bivariate associations. A relatively new but psychometrically sound measure, the Sexual Risk Survey (SRS; Turchik & Garske, 2009), was used in the present sample to assess a wide range of risky sexual behaviours, including some that are commonly reported on (e.g., number of sexual partners, unprotected sex) as well as other more specific, but less researched experiences (e.g., sex with a new partner before discussing their sexual history, "hooking up" but not having sex with a stranger). This provides further support for the presence of a significant association between the validated constructs of interpersonal trauma and risky sexual behaviours, allowing for more reliable interpretations to be made.

In contrast, there was not a significant association between nonsexual interpersonal trauma and risky sexual behaviours; however, this pathway did approach significance with a beta weight of .10 (p = .053). This null finding is in contrast to a handful of studies that have found a link between nonsexual forms of interpersonal trauma, such as child physical abuse, child psychological maltreatment, or intimate partner violence and risky sexual behaviours (Messman-Moore et al., 2010; Silverman et al., 2001; Van Bruggen et al., 2006).

Both sexual trauma and nonsexual interpersonal trauma severity showed significant associations with level of substance use and related problems. Specifically, as the severity of women's interpersonal trauma histories increased they drank more in terms of frequency and amount, they were more likely to experience problems associated

with their alcohol use (e.g., failing to do what was normally expected of them), they were more likely to be current or have been past smokers, they reported greater frequency of marijuana use, and they were more likely to have problematic symptoms (e.g., withdrawal) related to other drug use. For the sake of brevity, these outcomes will be referred to as increased substance use and associated problems throughout the discussion. Specific measurement items can be referred to in the appendices. This result is in keeping with much of the research that demonstrates a reliable association between interpersonal trauma and substance use (Anda et al., 1999; Dansky et al., 1995; Felitti et al., 1998; Gidycz et al., 2008; Hedtke et al., 2008; Hussey et al., 2006; Irwin et al., 1995; Kendler et al., 2000; Kilpatrick et al., 1997; McCauley et al., 1997; Ouimette & Brown, 2003; Springs & Friedrich, 1992; Ullman & Brecklin, 2003; Walker et al., 1999). Furthermore, this may suggest that trauma survivors engage in substance use in order to numb or neutralize the psychological pain they experience in relation to their trauma histories.

Next, significant associations were found between PTSS severity and both sets of health risk behaviours (i.e., risky sexual behaviours and substance use problems), contributing to a small but growing area of research examining these relations (Epstein et al., 1998; Green et al., 2005; Kilpatrick, 1990; Kilpatrick et al., 2000; McCauley et al., 2009; Shin, Miller & Teicher, 2013; Weaver & Etzel, 2003). Women who reported more severe PTS symptoms also engaged in more sexual risk taking behaviours and reported greater substance use as well as more symptoms and problems associated with drug and alcohol use. Furthermore, when looking specifically at nonsexual interpersonal trauma, PTSS severity fully mediated substance use and associated problems. This finding is

particularly notable as it identifies the development of posttraumatic stress symptoms as a key component accounting for the established link between women's nonsexual interpersonal trauma experiences such as physical and psychological abuse in childhood, adolescence, and adulthood and substance use outcomes. This fully mediated pathway provides support for the self-medication hypothesis (Khantzian, 1985), or the suggestion that trauma survivors engage in substance use as an attempt to cope with psychological distress. Support is tentative, at this point, given that these findings are based on cross-sectional and not longitudinal data.

PTSS severity was also tested as a mediator of risky sexual behaviours in the context of nonsexual interpersonal trauma. Despite a nonsignificant direct relation between nonsexual trauma and risky sexual behaviours, the indirect pathway through PTSS severity was found to be significant. Similar to the case above with substance use, this suggests that women who have a history of nonsexual interpersonal trauma engage in risky sexual behaviours as a function of the severity of their posttraumatic stress symptoms. This may provide preliminary support that women engage in sexual risk-taking as a method of coping with the emotional impact of suffering from posttraumatic stress. However, other explanations are possible as well, and are discussed in greater detail below. To the author's knowledge, this is the first investigation to establish a significant indirect association linking nonsexual interpersonal trauma to increased risky sexual behaviours through PTSS severity. In their sample of university students, Green and colleagues (2005) found separate links between both trauma exposure and PTSD, and risky sexual behaviours, including an earlier version of the dysfunctional sexual behaviour measure used in the present study. Similarly, Cavanaugh, Hansen, and

Sullivan (2009) found that IPV-related PTSD was associated with risky sexual behaviour, including having unprotected sex with a high-risk sexual partner and trading sex, in their sample of adult women. However, neither of these studies specifically tested for a mediated or indirect pathway.

Turning now to histories of sexual victimization, while severity of sexual trauma was associated with both risky sexual behaviours and substance use, PTSS severity was not found to mediate either of these pathways. In the case of alcohol use specifically, this is inconsistent with findings by from Epstein and colleagues (1998) whose study showed support for a model in which PTSS fully mediated the association between CSA and alcohol use in a sample of adult women. Similarly, Bedard-Gilligan, Cronce, Lehavot, Blayney, and Kaysen (2013) found that PTSD status in sexual assault survivors predicted alcohol use, whereas trauma exposure without PTSD did not. Despite being preliminary, and counter to expectations, these findings are particularly important given that mediation models involving the association between sexual trauma and health risk behaviours have not been extensively tested or presented in the literature.

The most parsimonious explanation for the absence of mediated pathways between sexual trauma and health risk behaviours is that these are direct, unmediated links rather than potentially mediated pathways. This is consistent with several studies that found strong direct associations between sexual abuse or assault and risky sexual behaviours (Brener et al., 1999; Gidycz et al., 2008; Messman-Moore et al., 2010; Silverman et al., 2001; Van Bruggen et al., 2006), as well as between sexual trauma and substance use (Gidycz et al., 2008; Hussey et al., 2006; Kendler et al., 2000; McCauley et al., 1997; Springs & Friedrich, 1992; Ullman & Brecklin, 2003). A direct link from

interpersonal traumas of a sexual nature to health risk behaviours would suggest a fundamental contrast to pathways originating from *nonsexual* interpersonal traumas, which as outlined above, are more likely to be indirect relations through a mediator such as PTSS severity. A similar explanation is that the association between sexual trauma and health risk behaviours is a direct pathway that may occur in the reverse direction of that presented here. Specifically, it could be that sexual risk-taking leads to sexual victimization, an association that has been documented in the literature (e.g., Messman-Moore et al., 2010; Van Bruggen et al., 2006). In fact, both of the above cited studies investigated risky sexual behaviours as a mediator of revictimization, and found that risky sexual behaviours in individuals with a CSA history accounts, at least in part, for the association with new sexual traumas in adolescence or adulthood. Accordingly, this reverse directionality may account for the association between risky sexual behaviors and sexual trauma in adolescence or adulthood, but it is less likely to account for the association with childhood sexual abuse. A similar case can be made for substance use predicting sexual trauma, where drug or alcohol use may place a woman at risk for a new sexual assault, for example, through impairing her ability to judge risky situations or her inability to resist physical force. The suggestion that substance use increases a woman's risk for later adolescent or adult sexual assault has been documented in the literature (Kilpatrick et al., 1998); however, attempts to support this hypothesis have shown mixed results (Champion et al., 2004; Hedtke et al., 2008), and furthermore, it is less likely that substance use temporally or causally precedes incidents of child sexual abuse.

Alternatively, other constructs, not tested in the current study may account for the development of risky sexual behaviours and substance use among survivors of sexual

trauma better than posttraumatic stress symptoms. For example, dissociation is commonly associated with a history of interpersonal trauma, particularly traumas of a sexual nature (Briere & Scott, 2013; Chu & Dill, 1990; Linehan, 1993). Dissociation may also account for the presence of risky sexual behaviours and/or substance use in those with a history of sexual victimization (Hansen et al., 2012). In particular, a woman may be more likely to dissociate when engaging in new, but potentially consensual, intimate encounters due to the presence of trauma cues and triggers. The process of dissociation may then interfere with her ability to make decisions as the sexual encounter progresses, and a risky experience, such as sex without protection or completed intercourse with a stranger, may then occur.

It has been proposed that the construct of emotion dysregulation (i.e., the inability to manage and tolerate intense, and often negative, emotions; Briere, 2002; Linehan, 1993) may operate in a similar way, taking into account dissociative experiences, as well as other correlates of emotion dysregulation. Messman-Moore and colleagues (2010) found that among child abuse survivors, emotion dysregulation was associated with number of lifetime sexual partners and risky sex with a stranger, but not risky sex with a regular partner. Similarly, emotion dysregulation is commonly linked with tension-reduction behaviours, such as bingeing or self-harm, and risky sexual behaviours have been conceptualized by some as a type of tension-reduction behaviour (Batten, Follette, & Aban, 2002; Briere & Scott, 2013). Furthermore, substance use is theorized to serve a similar function as tension-reduction behaviour in that it allows the traumatized individual to experientially avoid or neutralize their emotional distress (Briere, 2002; Weaver & Etzel, 2003).

Relations among interpersonal trauma, PTSS severity, and health risk behaviours are, in and of themselves, both interesting and important. Nevertheless, an additional purpose of examining these pathways was to establish associations between PTSS severity and health risk behaviours in the context of interpersonal trauma, so that the proposed health risk behaviours (i.e., substance use and risky sexual behaviours) could be explored as possible explanatory mechanisms in the relation between PTSS severity and adverse health outcomes.

Risky Sexual Behaviours, Substance Use, and Adverse Health Outcomes

Counter to expectations, the health risk behaviours examined here – risky sexual behaviours and substance use – were not significantly associated with self-reported health problems in the context of interpersonal trauma and PTSS severity. While there was a significant path from substance use problems to adverse health outcomes in the direct effects model, this path was no longer significant in the presence of trauma variables and PTSS severity. In addition, risky sexual behaviours were not associated with self-reported health in either the direct effects or the mediated models. Without a significant association between the proposed mediators and the outcome variable, mediation could not be tested; therefore, results are inconclusive with respect to the mediating role of risky sexual behaviours and substance use problems.

This is counter to findings in the literature that identify links between risky sexual behaviours and sexual health problems (Lacelle et al., 2012; WHO, 2004) as well as between substance use and physical health problems (e.g., Rehm et al., 2006; Rheingold et al., 2004). This is also inconsistent with the theoretical understanding of health risk behaviours as phenomena that create some level of risk to an individual's health status.

However, a recent study with female college students (Bedard-Gilligan et al., 2013) also found that while PTSD was associated with alcohol use in sexual assault survivors, alcohol use was not predictive of physical health complaints. Clearly, hypothesized mediation pathways involving health risk behaviours remained exploratory and, as they were relatively untested at the outset of this investigation, further research in this area is strongly needed.

Given the young age of study participants, and the cross-sectional nature of the data, it must be considered that the impact of behaviours involving risky sex and substance use on physical health was not yet detectable, or had not yet developed. While certain physical symptoms and problems (e.g., cold and flu symptoms, headaches, sexually transmitted infections) may develop in a relatively short time-frame, more serious health problems that impact functional health, global health perceptions, and manifest as chronic health conditions are more likely to transpire over the course of several years or decades. This explanation is consistent with longitudinal investigations following trauma survivors for decades after their trauma exposure and finding consistent links with respiratory, cardiovascular, and neurological problems (e.g., Ford, 2004; Kimerling et al., 2000). It is also possible that the women in this sample simply have fewer and less severe physical health problems than those detected in other samples, due to their higher SES and education levels, higher overall level of functioning and associated protective factors, in addition to their young age (Segerstrom & Miller, 2004). Preliminary support for this suggestion is offered by examining the mean score on the Health Symptom Checklist (Runtz, 2002) in the present sample (M = 22.5; SD = 17.7), which is less than half of the mean score on the same measure in a more diverse

community sample of women with a wider range of sociodemographic properties, including a larger proportion of disadvantaged and minority status women (*M* = 46.6; *SD* = 29.7; Hager & Runtz, 2012).

It may also be the case that other health risk behaviours, not investigated in this study, could play a more important role or may create a more proximal risk to physical health status among university students. For example, disordered eating and associated problems such as purging, and use of laxatives or diet pills, are prevalent among interpersonal trauma survivors (Gidycz et al., 2008; Silverman et al., 2001), and have obvious implications for physical health. In addition, reckless or impaired driving, suicidality, and nonsuicidal self-injury have all been associated with interpersonal trauma histories (Rodriguez-Srednicki, 2001; Silverman et al., 2001), and pose a clear risk to health. Furthermore, there are potential protective mechanisms, such as access to health care, appropriate utilization of health care when available, participation in preventative screening tests, adequate sleep, and regular exercise, all of which may serve to offset health risks when these behaviours are present. In fact, some investigations have shown that interpersonal trauma survivors are less likely to seek professional help for valid health concerns (Orchowski, Meyer, & Gidycz, 2009), and are less likely to participate in preventative screening measures such a breast exams, pelvic exams, and STI testing (Farley, Golding, Minkoff, 2002; Mathew et al., 2013; Springs & Friedrich, 1992). The impact of these potentially health-promoting behaviours, or lack thereof, is an important area for future investigation.

Limitations and Future Research Directions

Findings from this study are meant to be interpreted in the context of certain limitations. First, sample characteristics should be taken into consideration when generalizing these findings to the wider population. Study participants were selected from an undergraduate student sample primarily composed of young, Caucasian women from middle- and upper-middle socioeconomic backgrounds. In addition, as a sample of currently registered university students, these women have already achieved a level of education higher than many subsets of the general population. Accordingly, results from this investigation may not be generalizable to more diverse and less advantaged populations. In particular, the contribution of socioeconomic status, measured here as family income and education background, to physical and mental health outcomes cannot be understated. Given the limited range of SES, and the relative economically privileged nature of the current sample, the impact of low SES on the variables studied could not be reliably investigated. Nevertheless, socioeconomic resources play an important role in health outcomes and should be examined more thoroughly in future studies.

Similarly, the limited ethnic diversity in the present sample made it impossible to detect and analyze the possible contributions of certain ethnic and cultural backgrounds on specific variables and associations. For example, First Nations women are likely to have informative experiences linking interpersonal trauma, health risk behaviours, and health outcomes; experiences that are likely to differ in important ways from the majority of this sample. However, because only two participants in this study identified as being from First Nations heritage, these associations could not be further explored as part of this study. Future investigations would benefit from sampling practices that allow for an

examination of the unique experiences of various ethnic, cultural, and other minority subsets of the population.

In addition, the young age and relatively high functioning nature of the present sample may make for less than ideal circumstances for detecting long-term health outcomes, which are more likely to develop later in life, as well as for the investigation of more severe forms of trauma exposure, impairing psychological distress, and the most problematic forms of health risk behaviours. Future investigations should consider exploring similar research questions in a wider age range of participants and in samples with lower levels of overall functioning (e.g., clinical samples, disadvantaged populations, etc.). Similarly, through use of a female-only sample, the results of this investigation cannot be generalized to men or to male survivors of interpersonal trauma. Furthermore, sexual behaviour and physical health often manifest quite differently among men. It will be of interest to examine the findings presented here, along with related research questions, in a representative sample of men.

With these limitations stated, it is important to acknowledge that young adult women and female university students are a critical population to study when examining the impact of interpersonal trauma, in part because this group is at heightened risk of experiencing several forms of interpersonal victimization, such as sexual assault and physical violence in dating relationships (Ageton, 1983; Fisher, Cullen, & Turner, 2000; Maxwell, Robinson, & Post, 2003; Tjaden & Thoennes, 2000). As such, findings from this study are likely to be especially relevant to young adult women, particularly those who are attending or have attended university.

A second area of limitation is that the measures used in this study are of a retrospective, self-report nature. Self-reports are subject to the inaccuracy of retrospective recall and are often influenced by several factors, including memory distortions, social desirability, and willingness to disclose sensitive experiences and personal information (Johnson & Richter, 2004). Self-report methods of assessment are best considered as measures of subjective perceptions, and may differ from more objective accounts of experiences. However, perceptions of traumatic experiences can play a role in the severity and type of symptoms that develop in the aftermath of the trauma (Brewin, Andrews, & Valentine, 2000; Schnurr & Green, 2004). In addition, there is some evidence to support the accuracy of retrospective self-reports of interpersonal trauma, particularly findings that show the stability of self-reports before and after therapeutic change and the reduction of trauma-related psychopathology (Paivio, 2001). Finally, the manner of self-report used in the present study involved a series of questionnaires to which participants responded by endorsing relevant symptoms or experiences from a list of possible items. This differs from the assessment of symptoms, and ultimately diagnosis, that would occur during an interview with a qualified health care professional, and may perhaps lead to an over reporting of symptoms as compared to the latter method. Future investigations should consider the role of more objective assessment methods and possible verification of symptom reports and health outcomes, for example, through physician report, formal testing of physical and psychological states, and a review of medical records.

Finally, because students volunteered for participation in this study, there is the potential for a self-selection bias. For the most part, these women chose to enrol in an

undergraduate psychology course, and subsequently, chose to volunteer for this particular study which may have included self-selection (or self-exclusion) based on interpersonal trauma history, psychological difficulties, or the existence of physical health problems. The contribution of these factors is unknown and may serve to limit the generalizability of these results.

Methodological limitations should also be considered in the interpretation of these results. This investigation used cross-sectional data to test hypothesized relations, which does not allow the author to draw conclusions about directionality or causality. Furthermore, it is now strongly preferred that hypothesized mediation pathways be tested in longitudinal, rather than cross-sectional, designs to ensure that the predictor temporally precedes the mediator, and that both temporally precede the criterion or outcome variable (Antonakis, Bendahan, Jacquart, & Lalive, 2010; Kraemer, Kiernan, Essex, & Kupfer, 2008). While design attempts were made to better specify the timeline of events (e.g., models included lifetime ratings for trauma and PTS symptoms but more current ratings for health risk behaviours and health outcomes), this does not compensate for the cross-sectional nature of the data, and still does not allow for conclusions about directionality to be made. Accordingly, the mediation results presented here are tentative, at best, and should be replicated and extended through studies of longitudinal design. Similarly, minor changes, such as the removal of poorly performing indicators (e.g., the Risky Anal Acts subscale of the Sexual Risk Survey), were made to some measurement models during the analysis phase. As a result, the findings from this investigation should be considered exploratory, and will need to be replicated and further validated in future research.

It is notable that some prospective or longitudinal studies in this area have been inconclusive, perhaps due to shorter than ideal follow-up times. For example, Gidycz and colleagues (2008) followed participants for three months in order to measure the impact of health risk behaviours (i.e., risky sexual behaviours, smoking, drug use, suicidal ideation, and excessive weight loss strategies) on new instances of sexual victimization. While a history of sexual victimization was associated with many of the health risk behaviours and with future victimizations, health risk behaviours at baseline did not predict sexual victimization at the 3-month follow-up. The authors note that this may be due to the short follow-up time and recommend longer follow-up periods in future prospective studies. While the need for longitudinal research cannot be understated, extensive resources and time investments are required to properly carry out a multi-year, and possibly multi-decade, study when investigating long-term outcomes such as physical health problems. Sources for longitudinal data are available for some populations, such as combat veterans; however, there is a significant need for large, representative, centrally accessible databases that assess for interpersonal trauma, posttraumatic symptomatology, and physical health indicators, while using a longitudinal design. Availability of longitudinal data, without placing the onus for extensive resources on individual researchers, would allow such researchers to investigate various pathways across time and across the lifespan, clarifying the mechanisms of action and other contributing factors, and in turn, providing valued contributions to public health, prevention, and intervention policies.

Finally, there were a few methodological limitations related to the measurement of study variables and the strategies used to manage missing data. As described in the

Results section, small amounts of missing data, determined to be missing at random, were replaced with scores of zero instead of using mean replacement or EM imputation. This decision was made in the case of three interpersonal trauma variables (i.e., adolescent/adult sexual assault, child sexual abuse, and intimate partner violence) so that participants who may have randomly missed a specific item were not presumed to have an abuse or trauma history when their data profile suggested otherwise (i.e., no other items on the same measure were endorsed). The disadvantage of this choice is that participants may have chosen to not respond to these specific items rather than disclosing a specific trauma experience. Unfortunately, the true reason for the non-response cannot be known for sure, and while this only occurred in a very small number of cases, results should be interpreted with appropriate caution and should be considered conservative estimates of true associations.

A related limitation in the area of measurement involves the possible subjectivity of responses to interpersonal trauma measures. This is most problematic with assessment methods that label experiences without operationally defining the label (e.g., "have you been abused?"). While measures used in the present investigation were chosen based on behaviourally-based language and attempts to minimize subjective interpretation, some amount of subjectivity always remains. For example, the child physical abuse measure includes an item asking participants if a parental figure ever "seriously threatened your life?" Some participants might consider behaviours to be life threatening that other participants would not. Therefore, as is the case with most self-report measures, assessments of interpersonal trauma should be considered subjective accounts of each woman's experience.

A similar limitation pertains to the scoring of the child sexual abuse (CSA) measure, and to some extent, the adolescent/adult sexual assault (ASA) measure. These scales use behaviourally-specific items (e.g., "Has anyone ever touched the sex organs of your body when you did not want this?") to assess for experiences of victimization, experiences which are then ordered based on presumed severity from least severe (no assault/abuse) to most severe (rape/penetration). This method of scoring should not be mistaken for the creation of a truly continuous variable, or an interval scale. Variables that take into account the severity of CSA and ASA experiences are strongly recommended in the literature (Briere, 1992; Hulme, 2007; Koss, 1993; Stoltenborgh et al., 2011); however, measures that lend easily to a severity scale are scarce. Furthermore, careful attention was made when scoring the CSA measure to follow a similar scoring method as that which has been recommended and tested in the ASA measure (the Sexual Experiences Survey, SES; Koss et al., 2007). However, this method of ordinal scoring has not been fully validated with the child sexual abuse measure, which is another important focus for future research investigations.

Clinical Implications

Findings from this study have implications for the development and efficacy of intervention and prevention programs particularly on university campuses, for health care policy, and for specific medical and mental health professionals. Beginning at the level of prevention and early intervention, programs aimed at education, safety, and risk reduction (e.g., Gidycz, Rich, & Marioni, 2002) have been developed in an attempt to lower rates of interpersonal victimization, and sexual assault in particular, on college and university campuses. Given the relatively high rates of interpersonal trauma among

young adult women and university students, these programs are of paramount importance. Moreover, considering the findings from the present study, early intervention programs may benefit from including education about the links between posttraumatic stress symptoms and problematic coping behaviours in the aftermath of an interpersonal trauma. Sexual assault survivors, in particular, tend to experience a strong sense of shame associated with engaging in risky sexual behaviours after their assault experience (Jaycox, Zoellner, & Foa, 2002), indicating that education and validation may serve to dissipate some of that shame, when combined with information and skills to help prevent the continuation of maladaptive coping.

In relation to the health care environment, a few important implications are to be considered. First, the present investigation found significant indirect links from nonsexual interpersonal trauma to health risk behaviours through PTSS severity. This may be particularly important in the case of risky sexual behaviours, where there was no significant direct link from nonsexual trauma. Indeed, while it is commonly recognized that risky sexual behaviours may develop among survivors of sexual trauma, this association is often missed when a nonsexual interpersonal trauma history is presented. Consequently, it is of particular importance that these results be disseminated to health care professionals involved with the treatment of and ongoing care of trauma survivors, and that those presenting with risky sexual behaviours be screened for all types of trauma histories.

Similarly, results confirming a link between posttraumatic stress symptoms and substance use problems present implications for health professionals involved in the treatment of substance abuse and dependence as well as the treatment of PTSD and other

trauma-related difficulties. Specifically, screening for interpersonal trauma histories should be a key step in the initial assessment process when an individual presents with a substance use problem. Moreover, in the process of designing an effective treatment plan, it may be especially important to assess for PTS symptoms and other posttraumatic reactions, and subsequently to integrate the treatment of these symptoms into the overall plan of care. A reciprocal arrangement would also be recommended for the treatment of trauma outcomes and PTSD, so that trauma survivors are screened for problematic substance use and appropriate intervention strategies are incorporated into their treatment plans.

There are important implications based on the conceptualization of risky sexual behaviours and substance use as maladaptive behavioural strategies used to cope with overwhelming psychological distress, as well as the finding that both of these sets of behaviours were significantly associated with PTSS severity. Ultimately, these research findings lend support for phase-based treatment interventions that combine trauma processing and treatment with effective skills training, the latter of which is used to address both emotional and behavioural dysregulation difficulties. These types of interventions are being increasingly applied to the treatment of complex PTSD, a disorder that tends to be associated with enduring interpersonal trauma, particularly that which begins in childhood. Guidelines for the treatment of complex PTSD in adults put out by the International Society for Traumatic Stress Studies (ISTSS; 2012) strongly recommend the use of phase-based or sequenced approaches that involve some form of skills training when treating more complex forms of PTSD. Specific interventions that use this approach include Cloitre's (2006) Skills Training in Affective and Interpersonal

Regulation (STAIR) which is combined with a Narrative Therapy approach to treating trauma, newer hybrid treatments that combine Dialectical Behaviour Therapy with Prolonged Exposure (Harned, Korslund, Foa, & Linehan, 2012), and Briere and Lanktree's (2011) Integrative Treatment for Complex Trauma, specifically designed to be accessible and relevant to disadvantaged youth. Furthermore, skills-based interventions that focus on changing maladaptive behaviours have shown a decrease in both risky sexual behaviours and substance use (e.g., Jaworski & Carey, 2001; Sikkema, Winett, & Lombard, 1995; Wolitski et al., 2006).

Finally, this investigation showed that the well-documented association between interpersonal trauma and adverse health outcomes was found to be partially mediated by PTSS severity. These associations have important implications for the integration of the medical and mental health systems. Individuals presenting at a hospital or physician's office with both physical health problems and posttraumatic stress symptoms may only have their physical symptoms attended to and treated. Appropriate referrals for treatment of mental health symptoms, and better integration of medical and mental health services are likely to improve long-term outcomes of women suffering as a result of interpersonal trauma histories.

Summary

This research study examined pathways among sexual and nonsexual interpersonal traumas, posttraumatic stress symptoms (PTSS), health risk behaviours, and adverse health outcomes in a sample of university women. Findings provided support for PTSS severity as a partial mediator of the association between interpersonal trauma and physical health problems, adding to existing literature that documents this pathway in

various trauma groups. These results contribute to a growing theory that it is one's psychological response to a trauma, rather than the trauma itself, that contributes to poor health outcomes. While PTSS severity only partially mediated the pathway from interpersonal trauma to physical health, this was perhaps to be expected, given the vast array of potential intervening processes which might contribute to poor health.

One of the key purposes of this investigation was to examine the roles of two types of health risk behaviours, sexual risk taking and substance use, in the lives of interpersonal trauma survivors, and to investigate the association between these health risk behaviours and physical health status. PTSS severity was found to fully mediate the relation between nonsexual trauma and substance use behaviours, suggesting that these women may be engaging in substance use as a means of coping with their posttraumatic stress. Similarly, nonsexual trauma was found to be indirectly associated with risky sexual behaviours through PTSS severity, again indicating that there may be something about the response involved in posttraumatic stress that places women at risk of increased sexual risk-taking. In contrast, PTSS severity did not mediate the relations between sexual trauma and each of the health risk behaviours, suggesting that these may be direct, unmediated pathways, or that some other set of factors (e.g., emotion dysregulation, dissociation), may play an important role in the aftermath of sexual traumas. Finally, contrary to hypotheses, no significant pathways were found linking risky sexual behaviours or problems with substance use to adverse health outcomes. Consequently, these health risk behaviours were not found to operate as mechanisms explaining the link from PTSS severity to physical health problems in this sample of university women.

The findings from this study contribute to the important body of literature exploring and documenting physical and psychological outcomes of interpersonal trauma. While some pathways were confirmed or clarified, others remain yet to be fully understood. Future research investigations should build on the results presented here and continue to work on establishing a more complete understanding of the mechanisms impacting women's mental health, behaviour, and physical health in the aftermath of interpersonal trauma.

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Appendix A: Consent Form

Life Experiences, Health and Relationships

Introduction: You are invited to participate in a study entitled *Life Experiences, Health and Relationships,* which is being conducted by Dr. Marsha Runtz (Associate Professor in the Department of Psychology) and Erin Eadie (Ph.D. student in Psychology). You may contact **Ms. Eadie** at **250-472-4177** or eeadie@uvic.ca if you have any questions about this research. You may also contact **Dr. Marsha Runtz**, the principal investigator, at **250-721-7546** or runtz@uvic.ca.

Purpose & Importance of the Study: The purpose of this research is to explore within the general population, different aspects of well-being and to examine the links between various life experiences, relationships across the life span, and health outcomes. This study is important because there is a lack of research in this area and because the findings will provide important information about factors which might influence the development of psychological and physical well-being. Understanding how life experiences might affect one's relationships and health will also provide important information to guide the development of counselling and therapy services for people with similar experiences.

Voluntary Participation: Your participation in this research must be completely voluntary. **You may withdraw from the study at any time** and you may refuse to answer any question(s) without having to explain your reasons for doing so and without consequences. You will still receive your Psychology course bonus points for this study whether you complete the questionnaire or if you submit a blank or incomplete questionnaire. Whether or not you participate in this study will have no effect on your grades or academic standing (aside from attaining bonus points) and your instructor will not have access to any of the information collected in this study. If you change your mind about having your responses used in this research, please indicate this by not submitting the online questionnaire and by closing the website. HOWEVER, AFTER SUBMITTING YOUR DATA ONLINE IT WILL BE LOGISTICALLY IMPOSSIBLE TO WITHDRAW (OR TO REMOVE YOUR DATA).

Anonymity: All of the responses that you give in this study are completely anonymous and confidential; your name will not be linked to your responses in any way. Your answers will be kept in an anonymous data bank without the possibility of identifying you. All of the information collected will be used for group-based analyses; that is, questionnaires will not be analyzed individually but will be pooled together with a large number of responses from other participants. Please do not write in or submit your name in any place on the questionnaire and please do not provide the names of any other individuals that may have been involved in any of the events you disclose in this questionnaire. We are limiting participation in this study to individuals who are 19 years of age or older. **If, however, we receive identifying information that leads us to believe that you or any individual who is under 19 years of age is at risk of harm, we would be obliged to inform the proper authorities.** If, you would like to report an incident of child maltreatment yourself or if you have concerns about a child at risk of maltreatment, please see the list of numbers at the bottom of this form.

Confidentiality: The confidentiality of your data will be further protected by keeping your responses and all data files and other research records secure (e.g., in password protected files and computers in locked offices). Only the researcher and research assistants will have access to the data. YOUR NAME AND STUDENT NUMBER ARE NOT ASSOCIATED WITH THE ELECTRONIC DATA. This information will be retained only within the Psychology Department for the purpose of assigning bonus points and will be discarded once the bonus points have been assigned. Computerized anonymous data will be kept for at least 10 years beyond the date of the last publication of the findings from this study.

Sensitive Topics: If you decide to participate in this study, you will be asked to complete an online questionnaire that inquires about a range of psychological and social issues including some personal or sensitive topics such as difficult life experiences (which may include experiences of childhood maltreatment and other forms of victimization across the lifespan), social relationships, psychological well-being, general demographic information, as well as physical and sexual health.

Eligibility: You are eligible to participate in this study if you are a UVic undergraduate student and if you are 19 years of age or older.

Inconvenience & Risks: Participation in this study may cause some inconveniences to you, including the time it will take to complete the questionnaire. A potential risk of participating in this research is that some people may feel some emotional discomfort as a result of answering questions of a sensitive nature (e.g., about sexual health or difficult life experiences). To deal with these risks, we want you to know that you do not have to answer any questions that make you feel uncomfortable, that you can withdraw your participation at any time, and that you can talk to the researcher (Dr. Runtz), the co-investigator (Ms. Eadie), or any of the research assistants involved about any concerns that might have arisen as a result of participating in this research. In addition, phone numbers for university and community resources will be provided at the end of this letter, should these services be of need to you.

Benefits: In addition to the bonus points that you receive in your psychology course, the potential benefits of your participation include 1) experiencing psychological research methods first hand, 2) helping us, the researchers, to assess the psychometric qualities of a questionnaire evaluating psychological health and relationships, and 3) helping us to understand how life experiences might affect people's health and adjustment as adults.

Compensation: To compensate you for your participation, you will receive bonus points towards your course grade in a psychology course at the University of Victoria. It is important for you to know that it is unethical to provide undue compensation to research participants, and if you agree to participate in this study, this form of compensation should not be coercive. If you would not participate if the compensation were not offered, then you should decline participation at this time.

Results from the Study: After you complete the study, you will receive a debriefing form that outlines the basic purpose of the research in more detail. If you would like a summary of the findings after the study is completed, you can contact Dr. Runtz directly or check her website (http://web.uvic.ca/~runtzweb/) for summaries of papers prepared from this project. It is anticipated that the results of this study will be shared with others in the following ways: in presentations to other graduate students and faculty, in conference presentations, on the website, and in published peer-reviewed articles.

Ethical Approval: In addition to being able to contact the researchers, you may verify the ethical approval of this study, or raise any concerns you might have by contacting the Associate Vice President, Research at the University of Victoria at (250) 472-4545 or ethics@uvic.ca.

Would you like to proceed with the survey questions?

- Yes, proceed with survey.
- No, I am no longer interested in participating.

THANK YOU FOR YOUR INTEREST AND PARTICIPATION IN THIS STUDY.

If any of the questions in this study made you uncomfortable in any way, or if participating in this study brought up any issues that are distressing for you, some resources that might be of assistance are provided below:

- **University of Victoria Counselling Services** (on campus), 250-721-8341, http://www.coun.uvic.ca/
- **NEED Crisis and Information Line** (community agency), 250-386-6323, 1-888-494-3888, http://www.needcrisis.bc.ca/
- **Help Line for Children**, 250-310-1234, www.gov.bc.ca/mcf/ (information on reporting child maltreatment)
- **British Columbia Psychological Association (BCPA) Referral Service**, 1-800-730-0522, http://www.psychologists.bc.ca/referral.html
- **Women's Sexual Assault Centre**: 250-383-3232, http://www.vwsac.com/
- **Island Sexual Health Society:** 250-592-3479, http://islandsexualhealth.org/
- **University of Victoria Health Services:** 250-721-8492, http://health.uvic.ca/

To print a copy of this form, please use CTRL + P or follow the usual methods for printing from your web browser.

Appendix B: Debriefing Form

Life Experiences, Health and Relationships

Purpose of the Study

Thank you for your interest and your participation in this study. Your responses are greatly appreciated especially because we realize that many of these questions were personal and perhaps not easy to answer. Please be assured that your responses will remain anonymous and confidential.

As mentioned in the informed consent letter, one of the main purposes of this research project is to assess the psychometric qualities of a questionnaire measuring relationships and psychological health. Specifically, this questionnaire assesses attachment patterns and associated beliefs and experiences. The study you have just participated in will allow us to have a better idea about the utility of this questionnaire to assess relationship problems in other individuals within the general population. Also, this study examines the consequences of life experiences in childhood, adolescence, and early adulthood. In particular, we are interested in how individuals cope with specific challenging experiences (that may include, but are not limited to, childhood maltreatment experiences) and what effects these coping patterns might have on their physical and psychological health. There is some evidence to suggest that individuals who have difficult life experiences (such as physical or sexual maltreatment) may cope with these experiences, in part, by engaging in behaviours that could negatively impact their physical and/or psychological well-being. Results from studies such as this one will be of benefit to psychologists and others in health care professions who assist those with difficult life experiences to cope in more adaptive and healthier ways, thereby potentially preventing long-term consequences of unhealthy coping.

We appreciate your participation in this study, and hope that it has been a valuable and informative experience for you.

If you have any questions about this study, please contact Ms. Erin Eadie (250-472-4177 or eeadie@uvic.ca or Dr. Marsha Runtz (250-721-7546 or runtz@uvic.ca). We will be happy to respond to any questions that you may have about this research. You may also contact the Associate Vice-President Research at the University of Victoria (250-472-4545 or ethics@uvic.ca) if you have any questions or concerns about this study.

PLEASE CLICK SUBMIT TO FINALIZE YOUR PARTICIPATION IN THIS STUDY

Do not close this browser without clicking submit unless you have changed your mind and no longer want to submit your responses.

THANK YOU!

To print a copy of this form, please use CTRL + P or follow the usual methods for printing from your web browser.

Appendix C: Demographic Questionnaire

Please tell us about yourself by answering the following demographic questions:

1. Where did you see the announcement for this study?
   - ☐ On the UVic Psychology 100 Research Participation System (online sign-up)
   - ☐ On the UVic Psychology Department Research bulletin board
   - ☐ On the Social Psychology Network website
   - ☐ On the American Psychological Society website
   - ☐ On Facebook
   - ☐ On another website posting
   - ☐ Via email distribution
   - ☐ On a public poster
   - ☐ Other *(Specify)*:_____

2. What is your gender?
   ☐ Female ☐ Male ☐ Other: _____

3. How old were you on your last birthday? (*age in years*) _____

4. Which of the below best describes your ethnic background? (Check all that apply)
   - ☐ Asian, Southeast Asian, South Asian etc. (Specify): _____
   - ☐ Black/African American/African Canadian
   - ☐ Caucasian/White/European Canadian/European American
   - ☐ First Nations/Aboriginal/Native Canadian/Native American
   - ☐ Hispanic/Latino
   - ☐ Mixed (*Specify*): _____
   - ☐ Other (*Specify*): _____

5. What is your country of origin? _____

6. What is your primary language (i.e. the language that you use the most or with which you feel the most comfortable)?
   - ☐ English
   - ☐ French
   - ☐ Spanish
   - ☐ Other (*Specify*):_____

7. What is the highest level of education you have completed?
   - ☐ some primary school (kindergarten to grade 7, but no secondary school)
   - ☐ some secondary school (high school, grades 8 to 12)
   - ☐ completed secondary school (or high school equivalent)
   - ☐ technical school or trade diploma
   - ☐ college/university: some undergraduate courses completed
   - ☐ college/university: completed undergraduate degree (e.g., B.A.)
   - ☐ college/university: completed a master degree (MA or M.Ps.)
   - ☐ college/university: completed a doctoral degree (Ph.D.)
   - ☐ college/university: other professional degree (e.g., M.D., LLB)

8. What is the highest level of education obtained by parents or a parental figure? (If applicable, choose the parent with the higher level of education)
   - ☐ some primary school (kindergarten to grade 7, but no secondary school)
   - ☐ some secondary school (high school, grades 8 to 12)
   - ☐ completed secondary school (or high school equivalent)
   - ☐ technical school or trade diploma
   - ☐ college/university: some undergraduate courses completed
   - ☐ college/university: completed undergraduate degree (e.g., B.A.)
   - ☐ college/university: completed graduate degree (e.g., MA or Ph.D.)
   - ☐ college/university: other professional degree (e.g., M.D., LLB)

9a. What is your personal income before you pay taxes?
   - ☐ 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-$79,999
   - ☐ $80,000-$89,999
   - ☐ $90,000-$99,999
   - ☐ $100,000 or more

9b. Do other people (e.g., partner, children) rely on your income? ☐ Yes ☐ No

9c. Please indicate who relies on your income:
   - ☐ Partner
   - ☐ Child(ren); specify number of children: _____
   - ☐ Other (*Specify*): _____

9d. What is your combined income with your partner or dependents who bring income into the household before any of you pay taxes?
   - ☐ 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-$79,999
   - ☐ $80,000-$89,999
   - ☐ $90,000-$99,999
   - ☐ $100,000 or more

10. If you were living with your family when you were 17, how much did your family members make (combined) at that time, before taxes? ☐ Not applicable
   - ☐ 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-$79,999
- ☐ $80,000-$89,999
- ☐ $90,000-$99,999
- ☐ $100,000 or more

11. Are you currently in a romantic relationship?
    - ☐ Yes
    - ☐ No

12. What is your current relationship status? (including same-sex partner, if applicable)
    - ☐ Single, never married
    - ☐ Living with relationship partner
    - ☐ Married
    - ☐ Separated
    - ☐ Divorced
    - ☐ Widowed

13. What is your sexual orientation?
    - ☐ Heterosexual
    - ☐ Bisexual
    - ☐ Lesbian or gay
    - ☐ Other: _____

14. What is your current country of residence? _____
    In what Province or State are you currently living?_____

15a. Are you currently a university or college student? ☐ Yes ☐ No

15b. What year are you in?
    - ☐ First year undergraduate (Freshman)
    - ☐ Second year undergraduate (Sophomore)
    - ☐ Third year undergraduate (Junior)
    - ☐ Forth year undergraduate (Senior)
    - ☐ Fifth+ year undergraduate
    - ☐ Graduate student

15c. What is your academic major (if applicable)?
    - ☐ Psychology
    - ☐ Undeclared
    - ☐ Not applicable

    Other (*Specify*):_____

Appendix D: Child Sexual Abuse scale

We know that many people have unwanted "sexual" or violent experiences during childhood. Some of these are with playmates or friends and some are with relatives or acquaintances. These experiences may be so upsetting that they may not be discussed with anyone. Sometimes they are forgotten for long periods of time, and sometimes they are frequently brought to mind.

We would like you to help us understand these types of experiences. Please try to remember whether any of the following occurred to you **prior to the age of 14**:

	As a child (13 and younger)
1. Has anyone ever exposed the sex organs of their body to you when you did not want it?	Yes ☐ No ☐
2. Has anyone ever threatened to have sex with you when you did not want it?	Yes ☐ No ☐
3. Has anyone ever touched the sex organs of your body when you did not want this?	Yes ☐ No ☐
4. Has anyone ever made you touch the sex organs of their body when you did not want this?	Yes ☐ No ☐
5. Has anyone ever forced you to have oral sex when you did not want this?	Yes ☐ No ☐
6. Has anyone ever forced you to have intercourse (anal or vaginal) when you did not want this?	Yes ☐ No ☐
7. Have you had any other unwanted sexual experiences not mentioned above? If yes, please specify:_____ _____	Yes ☐ No ☐
8. If you answered yes to more than one of the above, did these experiences happen with the same person or more than one other person? ☐ All with the same person ☐ With more than one other person; number of other individuals ____.	
9. Gender of the *other person*	male ☐ female ☐
10. Age of the *other person* at the time of the incident.	_____
11. Relationship *of the other person* to you	☐ parent, stepparent, or guardian ☐ brother or sister ☐ grandparent ☐ cousin ☐ uncle or aunt ☐ other *adult* relative ☐ adult authority figure (e.g., teacher, minister) ☐ your boyfriend or girlfriend ☐ other known adult (*not family*) ☐ stranger
12. Was *physical force* ever used?	Yes ☐ No ☐

13. Approximately how many times did it happen?	_____
14. Your age the *first* time it occurred	_____
15. Your age the *last* time it occurred	_____

Note. If participants checked 'with more than one other person' for item 8, the remaining items (9 to 15) were repeated for the number of individuals they have indicated.

Appendix E: Psychological Maltreatment Review

Children and adolescents can experience a wide range of events in their families and with others while growing up. Some of these may have been upsetting and some of them may have been less upsetting. In this part of the questionnaire is listed a number of things that you may have experienced when you were growing up. There are no right or wrong answers for any of these items as everyone's childhood experiences are unique.

When you were 17 or younger, how often did the following things happen to you in the average year? Answer separately for your *mother* (or other woman who lived with you when you were a child) and *father* (or other man who lived with you when you were a child). If you had different men and/or women living with you when you were a child, pick the person who was around the longest in your life.

Use the following scale to indicate how often this happened:

0	1	2	3	4	5	6
Never	Once a year	Twice a year	3-5 times a year	6-10 times a year	11-20 times a year	Over 20 times a year

If there wasn't a mother (or other woman who lived with you) or father (or other man who lived with you) in your life, leave that section blank (don't choose any numbers for that person).

1. Yelled at you.
   - Your mother **0 1 2 3 4 5 6**
   - Your father **0 1 2 3 4 5 6**
2. Left you alone for long periods of time, when they shouldn't have.
   - Your mother **0 1 2 3 4 5 6**
   - Your father **0 1 2 3 4 5 6**
3. Were on your side when things were bad.
   - Your mother **0 1 2 3 4 5 6**
   - Your father **0 1 2 3 4 5 6**
4. Insulted you.
   - Your mother **0 1 2 3 4 5 6**
   - Your father **0 1 2 3 4 5 6**
5. Acted like they didn't seem to care about you.
   - Your mother **0 1 2 3 4 5 6**
   - Your father **0 1 2 3 4 5 6**
6. Praised you when you did something good.
   - Your mother **0 1 2 3 4 5 6**
   - Your father **0 1 2 3 4 5 6**
7. Criticized you.
   - Your mother **0 1 2 3 4 5 6**
   - Your father **0 1 2 3 4 5 6**
8. Ignored you.
   - Your mother **0 1 2 3 4 5 6**
   - Your father **0 1 2 3 4 5 6**

9. Said they loved you.

Your mother	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Your father	**0**	**1**	**2**	**3**	**4**	**5**	**6**

10. Said mean things about you.

Your mother	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Your father	**0**	**1**	**2**	**3**	**4**	**5**	**6**

11. Didn't do things for you that they should have.

Your mother	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Your father	**0**	**1**	**2**	**3**	**4**	**5**	**6**

12. Did things that let you know they loved you.

Your mother	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Your father	**0**	**1**	**2**	**3**	**4**	**5**	**6**

13. Called you names.

Your mother	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Your father	**0**	**1**	**2**	**3**	**4**	**5**	**6**

14. Acted like you weren't there, even though you were.

Your mother	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Your father	**0**	**1**	**2**	**3**	**4**	**5**	**6**

15. Hugged you.

Your mother	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Your father	**0**	**1**	**2**	**3**	**4**	**5**	**6**

16. Said you were stupid.

Your mother	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Your father	**0**	**1**	**2**	**3**	**4**	**5**	**6**

17. Weren't around when you needed them.

Your mother	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Your father	**0**	**1**	**2**	**3**	**4**	**5**	**6**

18. Took you places or did things with you.

Your mother	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Your father	**0**	**1**	**2**	**3**	**4**	**5**	**6**

19. Made fun of you.

Your mother	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Your father	**0**	**1**	**2**	**3**	**4**	**5**	**6**

20. Didn't do things they said they would do for you.

Your mother	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Your father	**0**	**1**	**2**	**3**	**4**	**5**	**6**

21. Encouraged you to have friends.

Your mother	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Your father	**0**	**1**	**2**	**3**	**4**	**5**	**6**

22. Tried to make you feel guilty.

Your mother	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Your father	**0**	**1**	**2**	**3**	**4**	**5**	**6**

23. Let you down.

Your mother	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Your father	**0**	**1**	**2**	**3**	**4**	**5**	**6**

24. Tried to make you feel better when you were upset or hurt.

Your mother	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Your father	**0**	**1**	**2**	**3**	**4**	**5**	**6**

25. Ridiculed or humiliated you.

Your mother	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Your father	**0**	**1**	**2**	**3**	**4**	**5**	**6**

26. Didn't seem to love you.

Your mother	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Your father	**0**	**1**	**2**	**3**	**4**	**5**	**6**

27. Talked to you.

Your mother	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Your father	**0**	**1**	**2**	**3**	**4**	**5**	**6**

28. Embarrassed you in front of others.

Your mother	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Your father	**0**	**1**	**2**	**3**	**4**	**5**	**6**

29. Didn't take care of you when they should have.

Your mother	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Your father	**0**	**1**	**2**	**3**	**4**	**5**	**6**

30. Helped you with homework or other things you had to do.

Your mother	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Your father	**0**	**1**	**2**	**3**	**4**	**5**	**6**

Appendix F: Family Violence Screening Questionnaire

Note: items will be presented immediately following the PMR using the same instructions.

1. Hit, kick, or beat you?

Your mother	0	1	2	3	4	5	6
Your father	0	1	2	3	4	5	6

2. Seriously threatened your life?

Your mother	0	1	2	3	4	5	6
Your father	0	1	2	3	4	5	6

3. Hit, kick, or beat his/her romantic partner in front of you?

Your mother	0	1	2	3	4	5	6
Your father	0	1	2	3	4	5	6

4. Was verbally aggressive with his/her romantic partner in front of you (shouting, insulting etc.)?

Your mother	0	1	2	3	4	5	6
Your father	0	1	2	3	4	5	6

Since you first began dating as an adolescent or an adult, how often did the following things happen to you with a romantic partner (e.g., husband, wife, boyfriend, girlfriend, date, etc.)?

Use the following scale to indicate how often any of your romantic partners:

0	**1**	**2**	**3**	**4**	**5**	**6**
Never	Once a year	Twice a year	3-5 times a year	6-10 times a year	11-20 times a year	Over 20 times a year

5. Hit, kick, or beat you?

In the last year	0	1	2	3	4	5	6
More than a year ago	0	1	2	3	4	5	6

6. Seriously threaten your life?

In the last year	0	1	2	3	4	5	6
More than a year ago	0	1	2	3	4	5	6

7. Was verbally aggressive with you (shouting, insulting, etc.)?

In the last year	0	1	2	3	4	5	6
More than a year ago	0	1	2	3	4	5	6

Appendix G: Sexual Experiences Survey

The following questions concern sexual experiences that you may have had that were unwanted. Your information is completely confidential and anonymous. We hope that this helps you to feel comfortable answering each question honestly. Please indicate the number of times each experience has happened to you. If several experiences occurred on the same occasion, for example, if one night someone told you lies and had sex with you when you were drunk, you would check both boxes a and c. The past 12 months refers to the past year going back from today. Since age 14 refers to your life starting on your 14th birthday and stopping one year ago today.

	Sexual Experiences	**How many times in the past 12 months?**	**How many times since age 14?**
1.	**Someone fondled, kissed, or rubbed up against the private areas of my body (lips, breast/chest, crotch or butt) or removed some of my clothes without my consent *(but did not attempt sexual penetration)* by:**	0 1 2 3+	0 1 2 3+
	a. Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I knew were untrue, or continually verbally pressuring me after I said I didn't want to.	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
	b. Showing displeasure, criticizing my sexuality or attractiveness, getting angry but not using physical force, after I said I didn't want to.	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
	c. Taking advantage of me when I was too drunk or out of it to stop what was happening.	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
	d. Threatening to physically harm me or someone close to me.	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
	e. Using force, for example holding me down with their body weight, pinning my arms, or having a weapon.	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐

2.	**Someone had oral sex with me or made me have oral sex with them without my consent by:**	0 1 2 3+	0 1 2 3+
	a. Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I knew were untrue, or continually verbally pressuring me after I said I didn't want to.	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
	b. Showing displeasure, criticizing my sexuality or attractiveness, getting angry but not using physical force, after I said I didn't want to.	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
	c. Taking advantage of me when I was too drunk or out of it to stop what was happening.	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
	d. Threatening to physically harm me or someone close to me.	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
	e. Using force, for example holding me down with their body weight, pinning my arms, or having a weapon.	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐

		How many times in the past 12 months?	How many times since age 14?
3.	**If you are a male, check box and skip to item 4** ☐ **A man put his penis into my vagina, or someone inserted fingers or objects without my consent by:**	0 1 2 3+	0 1 2 3+
	a. Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I knew were untrue, or continually verbally pressuring me after I said I didn't want to.	☐☐☐☐	☐☐☐☐
	b. Showing displeasure, criticizing my sexuality or attractiveness, getting angry but not using physical force, after I said I didn't want to.	☐☐☐☐	☐☐☐☐
	c. Taking advantage of me when I was too drunk or out of it to stop what was happening.	☐☐☐☐	☐☐☐☐
	d. Threatening to physically harm me or someone close to me.	☐☐☐☐	☐☐☐☐
	e. Using force, for example holding me down with their body weight, pinning my arms, or having a weapon.	☐☐☐☐	☐☐☐☐

4.	**A man put his penis into my butt, or someone inserted fingers or objects without my consent by:**	0 1 2 3+	0 1 2 3+
	a. Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I knew were untrue, or continually verbally pressuring me after I said I didn't want to.	☐☐☐☐	☐☐☐☐
	b. Showing displeasure, criticizing my sexuality or attractiveness, getting angry but not using physical force, after I said I didn't want to.	☐☐☐☐	☐☐☐☐
	c. Taking advantage of me when I was too drunk or out of it to stop what was happening.	☐☐☐☐	☐☐☐☐
	d. Threatening to physically harm me or someone close to me.	☐☐☐☐	☐☐☐☐
	e. Using force, for example holding me down with their body weight, pinning my arms, or having a weapon.	☐☐☐☐	☐☐☐☐

5.	**Even though it didn't happen, someone TRIED to have oral sex with me, or make me have oral sex with them without my consent by:**	0 1 2 3+	0 1 2 3+
	a. Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I knew were untrue, or continually verbally pressuring me after I said I didn't want to.	☐☐☐☐	☐☐☐☐
	b. Showing displeasure, criticizing my sexuality or attractiveness, getting angry but not using physical force, after I said I didn't want to.	☐☐☐☐	☐☐☐☐
	c. Taking advantage of me when I was too drunk or out of it to stop what was happening.	☐☐☐☐	☐☐☐☐
	d. Threatening to physically harm me or someone close to me.	☐☐☐☐	☐☐☐☐
	e. Using force, for example holding me down with their body weight, pinning my arms, or having a weapon.	☐☐☐☐	☐☐☐☐

		How many times in the past 12 months?	How many times since age 14?
6.	**If you are male, check this box and skip to item 7.** ☐ **Even though it didn't happen, a man TRIED to put his penis into my vagina, or someone tried to stick in fingers or objects without my consent by:**	0 1 2 3+	0 1 2 3+
	a. Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I knew were untrue, or continually verbally pressuring me after I said I didn't want to.	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
	b. Showing displeasure, criticizing my sexuality or attractiveness, getting angry but not using physical force, after I said I didn't want to.	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
	c. Taking advantage of me when I was too drunk or out of it to stop what was happening.	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
	d. Threatening to physically harm me or someone close to me.	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
	e. Using force, for example holding me down with their body weight, pinning my arms, or having a weapon.	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐

7.	**Even though it didn't happen, a man TRIED to put his penis into my butt, or someone tried to stick in objects or fingers without my consent by:**	0 1 2 3+	0 1 2 3+
	a. Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I knew were untrue, or continually verbally pressuring me after I said I didn't want to.	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
	b. Showing displeasure, criticizing my sexuality or attractiveness, getting angry but not using physical force, after I said I didn't want to.	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
	c. Taking advantage of me when I was too drunk or out of it to stop what was happening.	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
	d. Threatening to physically harm me or someone close to me.	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
	e. Using force, for example holding me down with their body weight, pinning my arms, or having a weapon.	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐

8. Did any of the experiences described in this survey happen to you 1 or more times? Yes ☐ No ☐

9. What was the sex of the person or persons who did them to you?
   - Male only ☐
   - Female only ☐
   - Both females and males ☐
   - I reported no experiences ☐

10. Have you ever been raped? Yes ☐ No ☐

Appendix H: PTSD Checklist – Civilian Version

Below is a list of problems and complaints that people sometimes have in response to stressful life experiences. Please read each one carefully, put an "X" in the box to indicate how much you have been bothered by that problem with respect to the difficult or stressful experiences you have previously indicated on this questionnaire. We will ask you to answer the list of questions twice, first *in the last month*, then at any point *prior* to the last month (i.e., *ever)*.

No.	Response:	Not at all (1)	A little bit (2)	Moderately (3)	Quite a bit (4)	Extremely (5)
1.	Repeated, disturbing *memories, thoughts,* or *images* of a stressful experience from the past?					
2.	Repeated, disturbing *dreams* of a stressful experience from the past?					
3.	Suddenly *acting* or *feeling* as if a stressful experience *were happening again* (as if you were reliving it)?					
4.	Feeling *very upset* when *something reminded* you of a stressful experience from the past?					
5.	Having *physical reactions* (e.g., heart pounding, trouble breathing, or sweating) when *something reminded* you of a stressful experience from the past?					
6.	Avoid *thinking about* or *talking about* a stressful experience from the past or avoid *having feelings* related to it?					
7.	Avoid *activities* or *situations* because *they remind you* of a stressful experience from the past?					
8.	Trouble *remembering important parts* of a stressful experience from the past?					

9.	*Loss of interest* in things that you used to enjoy*?*					
10.	Feeling *distant* or *cut off* from other people?					
11.	Feeling *emotionally numb* or being unable to have loving feelings for those close to you?					
12.	Feeling as if your *future* will somehow be *cut short*?					
13.	Trouble *falling* or *staying asleep*?					
14.	Feeling *irritable* or having *angry outbursts*?					
15.	Having *difficulty concentrating*?					
16.	Being *"super alert"* or watchful on guard?					
17.	Feeling *jumpy* or easily startled?					

Appendix I: Alcohol Use Disorders Identification Test (AUDIT)

Instructions: Please circle the option that best describes your answer to each question.

1. How often do you have a drink containing alcohol?

Never	Monthly or less	Two to four times a month	Two to three times a week	Four or more times a week

2. How many drinks containing alcohol do you have on a typical day when you are drinking?

1 or 2	3 or 4	5 or 6	7 to 9	10 or more

3. How often do you have six or more drinks on one occasion?

Never	Less than Monthly	Monthly	Weekly	Daily or almost daily

4. How often during the last year have you found that you were not able to stop drinking once you had started?

Never	Less than Monthly	Monthly	Weekly	Daily or almost daily

5. How often during the last year have you failed to do what was normally expected from you because of drinking?

Never	Less than Monthly	Monthly	Weekly	Daily or almost daily

6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?

Never	Less than Monthly	Monthly	Weekly	Daily or almost daily

7. How often during the last year have you had a feeling of guilt or remorse after drinking?

Never	Less than Monthly	Monthly	Weekly	Daily or almost daily

8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?

Never	Less than Monthly	Monthly	Weekly	Daily or almost daily

9. Have you or someone else been injured as a result of your drinking?

No		Yes, but not in the last year	Yes, during the last year

10. Has a relative or friend, or a doctor or other health worker been concerned about your drinking or suggested you cut down?

No	Yes, but not in the last year	Yes, during the last year

Appendix J: Fagerström Test for Nicotine Dependence - modified

The following questions are about the use of nicotine cigarettes. Please answer as honestly and accurately as you can.

1. Have you smoked cigarettes in the past year? Yes ☐ No ☐

2. Do you currently consider yourself to be a regular smoker? Yes ☐ No ☐

3.
   a. If you do not currently smoke, have you been a regular smoker in the past? Yes ☐ No ☐

   b. If yes, how long ago did you quit smoking? ___years or ___months.

   c. For how long were you a regular smoker? ___years or ___months.

   d. When you were a regular smoker, how many cigarettes did you typically smoke per day? ☐ 0-10
      ☐ 11-20
      ☐ 21-30
      ☐ >30

Please answer the remaining questions only *if you currently smoke cigarettes*.

	Question:	Response:	Score:
4.	How soon after you wake up do you smoke your first cigarette?	within 5 min 6-30 min 31-60 min after 60 min	3 2 1 0
5.	Do you find it difficult to refrain from smoking in places where it is forbidden?	Yes No	1 0
6.	Which cigarette would you hate most to give up?	The first one in the morning Any other	1 0
7.	How many cigarettes do you smoke per day?	0-10 11-20 21-30 >31	0 1 2 3
8.	How long have you smoked at this level?	___ years or ___ months	
9.	Do you smoke more frequently during the first hours after waking than during the rest of the day?	Yes No	0 1
10.	Do you smoke if you are so ill that you are in bed most of the day?	Yes No	0 1

Appendix K: Drug Abuse Screening Test – 10 (DAST-10), modified

Part 1: The following questions concern information about your use of drugs ***not including alcoholic beverages or nicotine*** during the **past year**. In the following statements "drug use" refers to the use of prescribed or over-the-counter drugs in excess of the directions OR any nonmedical use of drugs. Indicate on how many occasions have you used the following types of drugs?

1. Marijuana

In the past year:

Never 1-2 times 3-5 times 6-9 times 10-19 times 20-39 times 40 or more times

Ever:

Never 1-2 times 3-5 times 6-9 times 10-19 times 20-39 times 40 or more times

2. LSD

In the past year:

Never 1-2 times 3-5 times 6-9 times 10-19 times 20-39 times 40 or more times

Ever:

Never 1-2 times 3-5 times 6-9 times 10-19 times 20-39 times 40 or more times

3. Ecstasy/MDMA

In the past year:

Never 1-2 times 3-5 times 6-9 times 10-19 times 20-39 times 40 or more times

Ever:

Never 1-2 times 3-5 times 6-9 times 10-19 times 20-39 times 40 or more times

4. Other hallucinogens (example: mushrooms)

In the past year:

Never 1-2 times 3-5 times 6-9 times 10-19 times 20-39 times 40 or more times

Ever:

Never 1-2 times 3-5 times 6-9 times 10-19 times 20-39 times 40 or more times

5. Cocaine

In the past year:

Never 1-2 times 3-5 times 6-9 times 10-19 times 20-39 times 40 or more times

Ever:

Never 1-2 times 3-5 times 6-9 times 10-19 times 20-39 times 40 or more times

6. Heroin

In the past year:

Never 1-2 times 3-5 times 6-9 times 10-19 times 20-39 times 40 or more times

Ever:

Never 1-2 times 3-5 times 6-9 times 10-19 times 20-39 times 40 or more times

7. Crystal methamphetamine ("crystal meth")

In the past year:

Never 1-2 times 3-5 times 6-9 times 10-19 times 20-39 times 40 or more times

Ever:

Never 1-2 times 3-5 times 6-9 times 10-19 times 20-39 times 40 or more times

8. Inhalants (example: paint thinner)

In the past year:

Never 1-2 times 3-5 times 6-9 times 10-19 times 20-39 times 40 or more times

Ever:

Never 1-2 times 3-5 times 6-9 times 10-19 times 20-39 times 40 or more times

9. Nonmedical use of pain medications (example: morphine, codeine)

In the past year:

Never 1-2 times 3-5 times 6-9 times 10-19 times 20-39 times 40 or more times

Ever:

Never 1-2 times 3-5 times 6-9 times 10-19 times 20-39 times 40 or more times

10. Nonmedical use of sleeping medications (example: barbiturates)

In the past year:

Never 1-2 times 3-5 times 6-9 times 10-19 times 20-39 times 40 or more times

Ever:

Never 1-2 times 3-5 times 6-9 times 10-19 times 20-39 times 40 or more times

11. Nonmedical use of anxiety/sedative medications (example: Valium, Xanax, Ativan)

In the past year:

Never 1-2 times 3-5 times 6-9 times 10-19 times 20-39 times 40 or more times

Ever:

Never 1-2 times 3-5 times 6-9 times 10-19 times 20-39 times 40 or more times

12. Nonmedical use of stimulant medications (example: Ritalin, Concerta)

In the past year:

Never	1-2 times	3-5 times	6-9 times	10-19 times	20-39 times	40 or more times

Ever:

Never	1-2 times	3-5 times	6-9 times	10-19 times	20-39 times	40 or more times

Part 2: Please answer all of the following questions. If you have never used any drugs, please answer NO to all of the following questions. Remember that these questions ***do not*** **include alcoholic beverages or nicotine use.**

		In the **past year**...		**Before** the past year...	
1.	Have you used drugs other than those required for medical reasons?	Yes	No	Yes	No
2.	Do you use more than one drug at a time?	Yes	No	Yes	No
3.	Are you unable to stop using drugs when you want to?	Yes	No	Yes	No
4.	Have you ever had blackouts or flashbacks as a result of drug use?	Yes	No	Yes	No
5.	Do you ever feel bad or guilty about your drug use?	Yes	No	Yes	No
6.	Does your partner (or parents) ever complain about your involvement with drugs?	Yes	No	Yes	No
7.	Have you neglected your family because of your use of drugs?	Yes	No	Yes	No
8.	Have you engaged in illegal activities in order to obtain drugs?	Yes	No	Yes	No
9.	Have you ever experienced withdrawal symptoms (felt sick) when you stopped taking drugs?	Yes	No	Yes	No
10.	Have you had medical problems as a result of your drug use (e.g., memory loss, hepatitis, convulsions, bleeding)?	Yes	No	Yes	No

Appendix L: Dysfunctional Sexual Behavior subscale of TSI-2

Note: The Revised Trauma Symptom Inventory (TSI-2) is a copyrighted measure. Accordingly, only the instructions and two example items are presented here.

Instructions

Please read all of these instructions carefully before beginning. Mark all of your answers on this form.

This questionnaire describes experiences that may or may not have happened to you. Please circle the one answer that best indicates how often each of the following experiences have happened to you in
the last 6 months.

Circle 0 if your answer is **NEVER**; it has not happened at all in the last 6 months.
(0) 1 2 3

Circle 1 if it has happened in the last 6 months, but **only rarely**.
0 (1) 2 3

Circle 2 if it happened **sometimes** in the last 6 months
0 1 (2) 3

Circle 3 if your answer is **OFTEN**; it has happened often in the last 6 months.
0 1 2 (3)

If you make a mistake or change your mind, DO NOT ERASE! Make an "X" through the incorrect response and then draw a circle around the correct response.

23. Having sex with someone you hardly knew 0 1 2 3
79. Not protecting yourself during sex when you probably should have 0 1 2 3

Appendix M: Sexual Risk Survey

Instructions: Please read the following statements and record the number that is true for you over the time periods outlined below. If you do not know for sure how many times a behaviour took place, try to estimate the number as close as you can. Thinking about the average number of times the behaviour happened per week or per month might make it easier to estimate an accurate number, especially if the behaviour happened fairly regularly. If you've had multiple partners, try to think about how long you were with each partner, the number of sexual encounters you had with each, and try to get an accurate estimate of the total number of each behaviour. If the question does not apply to you or you have never engaged in the behaviour in the question, put a "0" on the blank. Please do not leave items blank. Indicate the number of times the behaviour has occurred separately for **the past 6 months** and **ever** (i.e., at any point in your lifetime prior to the past six months). Remember that in the following questions "sex" includes oral, anal, and vaginal sex and that "sexual behaviour" includes passionate kissing, making out, fondling, petting, oral-to-anal stimulation, and hand-to-genital stimulation.

		In the past 6 months	Ever
1.	How many partners have you engaged in sexual behaviour with but not had sex with?	_____	_____
2.	How many times have you left a social event with someone you just met?	_____	_____
3.	How many times have you "hooked up" but not had sex with someone you didn't know or didn't know well?	_____	_____
4.	How many times have you gone out to bars/parties/social events with the intent of "hooking up" and engaging in sexual behaviour but not having sex with someone?	_____	_____
5.	How many times have you gone out to bars/parties/social events with the intent of "hooking up" and having sex with someone?	_____	_____
6.	How many times have you had an unexpected and unanticipated sexual experience?	_____	_____
7.	How many times have you had a sexual encounter you engaged in willingly but later regretted?	_____	_____
For the next set of questions, follow the same direction as before. However, for questions 8–23, if you have never had sex (oral, anal or vaginal), please put a "0" on each blank.			
8.	How many partners have you had sex with?	_____	_____
9.	How many times have you had vaginal intercourse without a latex or polyurethane condom? Note: Include times when you have used a lambskin or membrane condom.	_____	_____
10.	How many times have you had vaginal intercourse without protection against pregnancy?	_____	_____

11.	How many times have you given or received fellatio (oral sex on a man) without a condom?	_____	_____
12.	How many times have you given or received cunnilingus (oral sex on a woman) without a dental dam or “adequate protection” (please see definition of dental dam for what is considered adequate protection)?	_____	_____
13.	How many times have you had anal sex without a condom?	_____	_____
14.	How many times have you or your partner engaged in anal penetration by a hand (“fisting”) or other object without a latex glove or condom followed by unprotected anal sex?	_____	_____
15.	How many times have you given or received analingus (oral stimulation of the anal region, “rimming”) without a dental dam or “adequate protection”?	_____	_____
16.	How many people have you had sex with that you know but are not involved in any sort of relationship with (i.e., “friends with benefits”, “fuck buddies”)?	_____	_____
17.	How many times have you had sex with someone you don’t know well or just met?	_____	_____
18a.	How many times have ***YOU*** used alcohol or drugs before or during sex?	_____	_____
18b.	How many times has ***YOUR PARTNER*** used alcohol or drugs before or during sex?	_____	_____
19.	How many times have you had sex with a new partner before discussing sexual history, IV drug use, disease status, and other current sexual partners?	_____	_____
20.	How many times (that you know of) have you had sex with someone who has had many sexual partners?	_____	_____
21.	How many partners (that you know of) have you had sex with who had been sexually active before you were with them but had not been tested for STIs/HIV?	_____	_____
22.	How many partners have you had sex with that you didn’t trust?	_____	_____
23.	How many times (that you know of) have you had sex with someone who was also engaging in sex with others during the same time period?	_____	_____

Appendix N: Health Symptom Checklist

Below is a list of physical complaints that people sometimes have. Please mark the symptoms which you have experienced *in the past six months*, indicating how often you experience each of them, by using the following scale. Also indicate if you have seen a health professional (e.g., a physician) for these difficulties.

0 = never
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

	Frequency						Sought Health Care	
1. Abdominal pain	0	1	2	3	4	5	Y	N
2. Allergy	0	1	2	3	4	5	Y	N
3. Genital pain	0	1	2	3	4	5	Y	N
4. Eczema	0	1	2	3	4	5	Y	N
5. Pain in inner thighs	0	1	2	3	4	5	Y	N
6. Gastric ulcer	0	1	2	3	4	5	Y	N
7. Painful urination	0	1	2	3	4	5	Y	N
8. Convulsions	0	1	2	3	4	5	Y	N
9. Chest pain/tightness	0	1	2	3	4	5	Y	N
10. Blurred vision	0	1	2	3	4	5	Y	N
11. Abdominal swelling	0	1	2	3	4	5	Y	N
12. Heart palpitations	0	1	2	3	4	5	Y	N
13. Temporary paralysis	0	1	2	3	4	5	Y	N
14. Vaginal/penile discharge	0	1	2	3	4	5	Y	N
15. Numbing of body parts	0	1	2	3	4	5	Y	N
16. Asthma (i.e., wheezing/shortness of breath)	0	1	2	3	4	5	Y	N
17. Cold hands	0	1	2	3	4	5	Y	N
18. High blood pressure	0	1	2	3	4	5	Y	N
19. Painful bowel movements	0	1	2	3	4	5	Y	N
20. Fainting	0	1	2	3	4	5	Y	N
21. Diarrhoea	0	1	2	3	4	5	Y	N
22. Stomach flu	0	1	2	3	4	5	Y	N
23. Pelvic pain	0	1	2	3	4	5	Y	N
24. Muscle weakness	0	1	2	3	4	5	Y	N
25. Stomach aches	0	1	2	3	4	5	Y	N
26. Muscle stiffness	0	1	2	3	4	5	Y	N
27. Constipation	0	1	2	3	4	5	Y	N
28. Tunnel vision	0	1	2	3	4	5	Y	N
29. Vaginal/penile pain	0	1	2	3	4	5	Y	N
30. Loss of voice	0	1	2	3	4	5	Y	N
31. Backaches	0	1	2	3	4	5	Y	N
32. Spastic colitis	0	1	2	3	4	5	Y	N
33. Skin rashes	0	1	2	3	4	5	Y	N
34. Vaginal dryness/penile irritation	0	1	2	3	4	5	Y	N
35. Headaches	0	1	2	3	4	5	Y	N
36. Abdominal cramps	0	1	2	3	4	5	Y	N
37. Pain in hips	0	1	2	3	4	5	Y	N

	Frequency						Sought Health Care	
38. Fatigue	0	1	2	3	4	5	Y	N
39. Pain behind navel	0	1	2	3	4	5	Y	N
40. Bloating	0	1	2	3	4	5	Y	N
41. Temporary blindness	0	1	2	3	4	5	Y	N
42. Bleeding between menstrual periods **(leave blank if you are male)	0	1	2	3	4	5	Y	N
43. Pain in the small of your back	0	1	2	3	4	5	Y	N
44. Face pain	0	1	2	3	4	5	Y	N
45. Eye pain associated with reading	0	1	2	3	4	5	Y	N
46. Difficulty swallowing	0	1	2	3	4	5	Y	N
47. Burning sensation in sexual organs or rectum	0	1	2	3	4	5	Y	N
48. Sore throat	0	1	2	3	4	5	Y	N
49. Weakness	0	1	2	3	4	5	Y	N
50. Double vision	0	1	2	3	4	5	Y	N
51. Pain in arms or legs	0	1	2	3	4	5	Y	N
52. Nausea	0	1	2	3	4	5	Y	N
53. Joint pain	0	1	2	3	4	5	Y	N
54. Get sick from different kinds of foods	0	1	2	3	4	5	Y	N
55. Other (briefly describe):	0	1	2	3	4	5	Y	N

Appendix O: Reproductive Health Questionnaire

Below is a list of symptoms and complaints that women sometimes report regarding their reproductive health. **If you are female**, please select the word that best describes how often you have experienced these symptoms ***in the past 6 months***.

Also indicate if you have sought health care (i.e., seen a doctor or other health professional) for these symptoms. Please only respond "*No answer*" to the items below if you have not had a menstrual period over the past 6 months, and/or if you have not been sexually active in the past 6 months, as appropriate.

	Frequency					**Sought Health Care**	
	Never	**Rarely**	**Sometimes**	**Often**		**Yes**	**No**
1. Painful menstruation	N	R	S	O	N/A	Y	N
2. Irregular menstrual periods	N	R	S	O	N/A	Y	N
3. Spotting or bleeding between menstrual periods	N	R	S	O	N/A	Y	N
4. Abdominal cramps prior to or during menstruation	N	R	S	O	N/A	Y	N
5. Abdominal cramps *not* associated with menstrual cycle	N	R	S	O	N/A	Y	N
6. Excessive menstrual bleeding	N	R	S	O	N/A	Y	N
7. Menstrual bleeding accompanied by a fever	N	R	S	O	N/A	Y	N
8. Fatigue associated with menstrual cycle	N	R	S	O	N/A	Y	N
9. Nausea associated with menstrual cycle	N	R	S	O	N/A	Y	N
10. Headaches associated with menstrual cycle	N	R	S	O	N/A	Y	N
11. Pelvic pain	N	R	S	O		Y	N
12. Abdominal pain (not cramping)	N	R	S	O		Y	N
13. Abdominal pain accompanied by a fever	N	R	S	O		Y	N
14. Abdominal bloating	N	R	S	O		Y	N
15. Swelling or puffiness in arms or legs that is associated with menstrual cycle	N	R	S	O	N/A	Y	N
16. Pain or tenderness in breasts	N	R	S	O		Y	N
17. Swelling of the breasts	N	R	S	O		Y	N
18. Hot flashes	N	R	S	O		Y	N
19. Missed at least two periods without being pregnant	N	R	S	O		Y	N
20. Abnormal vaginal discharge	N	R	S	O		Y	N
21. Vaginal dryness	N	R	S	O		Y	N
22. Genital pain	N	R	S	O		Y	N
23. Genital irritation	N	R	S	O		Y	N
24. Genital itching	N	R	S	O		Y	N
25. Pain during intercourse	N	R	S	O	N/A	Y	N
26. Bleeding associated with intercourse	N	R	S	O	N/A	Y	N
27. Painful urination	N	R	S	O		Y	N
28. Burning sensation during urination	N	R	S	O		Y	N
29. Frequent or urgent need to urinate	N	R	S	O		Y	N
30. Urinary incontinence (i.e. leaking)	N	R	S	O		Y	N
31. Yeast infection	N	R	S	O		Y	N

	Frequency					Sought Health Care	
	Never	**Rarely**	**Sometimes**	**Often**		**Yes**	**No**
32. Urinary tract infection (UTI) or bladder infection	N	R	S	O		Y	N
33. Sexually transmitted infections (e.g., HPV, Herpes, Chlamydia, etc.)	N	R	S	O		Y	N
34. Lack of interest in sex	N	R	S	O	N/A	Y	N
35. Lack of sexual pleasure	N	R	S	O	N/A	Y	N
36. Afraid of having sex	N	R	S	O	N/A	Y	N
37. Unable to become sexually aroused	N	R	S	O	N/A	Y	N
38. Unable to stay sexually aroused	N	R	S	O	N/A	Y	N
39. Unable to have an orgasm	N	R	S	O	N/A	Y	N
40. Feeling dissatisfied following sex	N	R	S	O	N/A	Y	N

41. Are you currently using a hormonal contraceptive (e.g., the pill, a birth control patch, Depo-Provera, a vaginal ring)?	Yes	No		
42. a) Did you have a menstrual period each month over the past 6 months?	Yes	No	b) If not, how many menstrual periods did you have in the past 6 months?	___
43. a) Are you currently pregnant?	Yes	No	b) If so, how many weeks are you into your pregnancy?	__ wks
c) If you are not currently pregnant, were you pregnant at any time during the past 6 months?	Yes	No		
44. Have you reached menopause (i.e., cessation of menstrual periods for at least 12 months)?	Yes	No		

Appendix P: Medical Conditions Checklist

Please **check** if a physician has ever diagnosed you with any of the following medical conditions, and if so, indicate **your age** at the time of your diagnosis, your age when the symptoms began.

☐ **Allergies**
Type of allergy _____
Age at diagnosis ___ Age symptoms began ___

☐ **Arthritis**
Type of arthritis _____
Age at diagnosis ___ Age symptoms began ___

☐ **Asthma**
Age at diagnosis ___ Age symptoms began ___

☐ **Cancer**
Type of cancer _____
Age at diagnosis ___ Age symptoms began ___

☐ **Chronic Pain**
Age at diagnosis ___ Age symptoms began ___

☐ **Diabetes**
Age at diagnosis ___ Age symptoms began ___

☐ **Congestive heart failure**
Age at diagnosis ___ Age symptoms began ___

☐ **Coronary artery disease**
Age at diagnosis ___ Age symptoms began ___

☐ **Epilepsy**
Age at diagnosis ___ Age symptoms began ___

☐ **Eye disease (e.g., glaucoma)**
Age at diagnosis ___ Age symptoms began ___

☐ **Gastrointestinal problems**
Age at diagnosis ___ Age symptoms began ___

☐ **High blood cholesterol**
Age at diagnosis ___ Age symptoms began ___

☐ **Hypertension**
Age at diagnosis ___ Age symptoms began ___

☐ **HIV/AIDS**
Age at diagnosis ___ Age symptoms began ___

☐ **Liver disease (e.g., hepatitis)**
Age at diagnosis ___ Age symptoms began ___

☐ **Lung disease (e.g., emphysema, obstructive pulmonary disease)**
Age at diagnosis ___ Age symptoms began ___

☐ **Migraine headaches**
Age at diagnosis ___ Age symptoms began ___

☐ **Osteoporosis**
Age at diagnosis ___ Age symptoms began ___

☐ **Skin disease (e.g., psoriasis, eczema)**
Age at diagnosis ___ Age symptoms began ___

☐ **Stroke**
Age at diagnosis ___ Age symptoms began ___

☐ **Thyroid disease**
Age at diagnosis ___ Age symptoms began ___

☐ **Tuberculosis**
Age at diagnosis ___ Age symptoms began ___

Appendix Q: 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:

0 = Not at all 1 2 3 4 = A great deal

1. My work and/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.
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.

Appendix R: Cantril Self-Anchoring Ladder

Here is a ladder. At the top of the ladder is the best possible health you can imagine. At the bottom of the ladder is the worst possible health you can imagine. Please choose a number on the ladder for each of the following, and write the numbers in the blank spaces provided.

1. Your current health ___
2. Your health in the past ___
3. Your health in the future ___
4. The best your health has ever been ___