RELATIONSHIPS BETWEEN CHILDHOOD EXPOSURE TO VIOLENCE, POSTTRAUMATIC STRESS, RESILIENCE, AND ALCOHOL MISUSE IN MI'KMAQ ADOLESCENTS

by

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ABSTRACT

This research was conducted in partnership with a Nova Scotain Mi'kmaq (First Nation) community that was interested in learning more about how exposure to violence (EV) might be related to youth alcohol use. There are many consequences of childhood exposure to violence (EV), but two of the more notable consequences of EV are posttraumatic stress (PTS) symptoms and excessive or problematic alcohol misuse. Given the strong relationship in the literature between each of the PTS symptom clusters and alcohol problems, it was hypothesized that these symptom clusters would mediate the relationship between EV and alcohol misuse. Study 1 demonstrated that PTS hyperarousal symptoms, but none of the other PTS symptoms, fully mediated the relationship between EV and alcohol misuse, even after controlling for depressive symptoms, age and gender. The literature on EV also demonstrates that despite its numerous potential negative consequences, some youth continue to thrive. This thriving in the face of hardship is called resilience. Study 2 employed a direct measure of resilience (Child and Youth Resilience Measure; Ungar et al, 2008) to examine which if any aspects of resilience can successfully buffer youth from experiencing negative mental health consequences after EV. Study 2 demonstrated that all three aspects of resilience (i.e., individual, family, and community) moderated the relationship between EV and PTS reexperiencing symptoms. More specifically, at higher levels of resilience, the positive relationship between EV and PTS reexperiencing symptoms was dampened. Study 3 documented the collaborative-research process from beginning (i.e., research question formation) to end (i.e., implementation of action-based recommendations). It highlighted how the research questions outlined in Studies 1 and 2 were relevant to both the specific community in question, as well as some Aboriginal communities more broadly. It also highlighted how the first author participated in a research process that is described by the Canadian Institutes of Health Research (CIHR) as Integrated Knowledge Translation (KT). And finally, it identified via qualitative and quantitative methods how the research process as a whole has helped equip the community with more tools to tackle the problems that its members have identified as important for study and change.

LIST OF ABBREVIATIONS AND SYMBOLS USED

AUD	Alcohol Use Disorder
APA	American Psychiatric Association
B	Unstandardized multiple regression coefficient
CBT	Cognitive Behavioural Therapy
CESD	Centre for Epidemiological Studies Depression scale
CEVQ	Childhood Experience of Violence Questionnaire
CFI	Comparative Fit Index
CI	Confidence Interval
CIHR	Canadian Institutes of Health Research
CPSS	Child Posttraumatic Stress Symptom scale
CRH	Corticotropine-Releasing Hormone
CSA	Childhood Sexual Abuse
CYRM	Child and Youth Resilience Measure
d	Effect size (difference between two means divided by a pooled standard deviation)
DSM-IV	*Diagnostic and Statistical Manual of Mental Disorders* (4th ed.)
DSM-IV TR	*Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text revision)
EV	Exposure to Violence
IFI	Incremental Fit Index
F	*F* ratio for total model being different from zero
f^2	Effect size used in context of *F* test for multiple regression
GSR	Galvanic Skin Response
HR	Heart Rate
KT	Integrated Knowledge Translation
LV	Lateral Violence
M	Mean
MH & SWS	Mental Health and Social Work Services
N	Total sample size
NADACA	Native Alcohol and Drug Abuse Counselling Association
NE	Nor-Epinephrine
ns	Non-Significant
OR	Odds Ratio
p	Probability of type I error
PI	Principle Investigator
PTS	Post-Traumatic Stress
PTSD	Post-Traumatic Stress Disorder
r	Pearson product-moment correlation
R^2	Multiple correlation squared (or variance accounted for by the model)
RAPI	Rutgers Alcohol Problem Index
RCMP	Royal Canadian Mounted Police
RMSEA	Root-Mean-Square-Error of Approximation

SD	Standard Deviation
SE	Bias-corrected Standard Error
SRD	Stress Response Dampening
t	T-test
TF-CBT	Trauma Focused-Cognitive Behavioural Therapy
USA	United States of America
X	Multiplication
ß	Beta weight; standardized multiple regression coefficient
χ^2	Computed value of a chi-square test
χ^2/df	Chi-square/ degrees of freedom ratio
%	Percent

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CHAPTER 1. INTRODUCTION

Broadly speaking, the purpose of this manuscript-based thesis is to understand how the symptoms of posttraumatic stress disorder (PTSD) are related to youth exposure to violence (EV), drinking behaviours, and resilience in a sample of school-attending Mi'kmaq (First Nation) adolescents. More specifically, this research program had three goals, which are presented in three publication-style manuscripts. The first goal was to test the self-medication hypothesis by demonstrating that PTSD, or its component symptoms, statistically mediate(s) the relationship between EV and problematic alcohol consumption. The second goal was to explore whether or not the construct of resilience moderated or "buffered" the relationship between EV and PTSD. In other words, at higher levels of resilience, the positive relationship between EV and PTS reexperiencing symptoms was dampened. And the final goal of this research program was to document the research process in such a way that it can provide a positive model for building and sustaining a collaborative research relationship between an aboriginal community and a research team including non-aboriginal researchers. Before presenting each individual study, I will first provide a brief literature review to give both a background and a context for this research. The document will conclude with an integrated discussion, highlighting the contribution of this work within the context of its limitations, as well as suggesting both next steps for research and the clinical implications and impact of the research.

Childhood Exposure to Violence

Although there is some evidence that substantiated cases of both sexual and physical abuse are on the decline in North America (Jones, Finkelhor, & Halter, 2006, Trocmé et al., 2005), the most recent Canadian Incidence Study (CIS) of Reported Child

Abuse and Neglect by Trocmé and colleagues (2005) reveals that while physical and sexual abuse might be on the decline, substantiated cases of maltreatment in general are on the rise. This is due largely to a rise in reported emotional abuse and exposure to domestic violence, as the annual incidence of substantiated child maltreatment investigations rose from 61,200 in 1998 to 114,607 in 2003 (Trocmé et al., 2003, 2005). Of course, true prevalence rates of maltreatment are expected to be much higher since official reports of maltreatment represent only the "tip of the iceberg" (MacMillan, Jamieson, Wathen, et al., 2007, p. 342). As the present dissertation research does not measure neglect, I will employ the term exposure to violence (EV) rather than maltreatment. I nonetheless caution that EV should not be confused with exposure to domestic violence, as the latter is a specific form of EV.

With respect to the EV literature, a great deal is known about the prevalence and consequences of both sexual and physical abuse, while relatively less research has been conducted on the topic of emotional abuse. This is likely due to the fact that physical and sexual abuse are overrepresented in child protection agency reports (Zellman & Faller, 1996), and that emotional abuse was once seen as a side effect of physical or sexual abuse (Perry, DiLillo, & Peugh, 2007). However, as the negative physical and psychological impacts of emotional abuse are becoming increasingly well documented (Edwards, Holden, Felitti, & Anda, 2003, Felitti et al., 1998; Johnson et al., 2002; Mullen Martin, Anderson, Romans, & Heribson, 1996; Walker, et al., 1999), emotional abuse is now being conceptualized as both an independent form of abuse, and one that interacts with other forms of abuse to greater deleterious effect (Edwards et al., 2003). Furthermore, at least one national (USA) study that measured multiple forms of abuse

cited emotional abuse as the most prevalent form of abuse (e.g., Finkelhor, Ormrod, Turner, & Hamby, 2005).

Emotional Abuse

A critical issue in researching emotional abuse is its lack of an agreed upon definition (Twaite & Rodriguez-Srednicki, 2004), and some have speculated this is yet another reason as to why it has been less studied than either physical or sexual abuse (Perry et al., 2007). Definitions of emotional abuse have tended to focus on the behaviours of the caregiver, the symptoms of the child, or both (Twaite & Rodriquez-Srednicki, 2004). However, elements that seem to be common across most definitions (see Twaite & Rodriquez-Srednicki, 2004 for a review of definitions) include habitual patterns of denigration and rejection by the caregiver that result in making the child feel worthless and unwanted. As summarized by Perry and colleagues (2007), emotional abuse covers a wider range of less conspicuous behaviours than either physical or sexual abuse. These behaviours include yelling or saying hurtful things that can lead to a blurry boundary between negative—but still subthreshold—interactions between caregiver and child and those behaviours that cross said boundary into abuse. Given this wide range of possible behaviours that have been termed emotional abuse, variance across studies might be largely influenced by what aspects of emotional abuse are being measured. Furthermore, earlier research (e.g., Mullen et al., 1996) did not differentiate between emotional abuse and emotional neglect, while more current research tends to make this separation (e.g., Scher, Forde, McQuaid, & Stein, 2004; Spertus, Yehuda, Wong, Halligan, & Seremetus, 2003). Presently, there is an increasing sense of agreement with respect to what constitutes an operational definition of emotional abuse, as more studies

(e.g., Edwards et al., 2003; Medrano, Zule, Hatch, & Desmond, 1999; Perry et al., 2007; Scher et al., 2004, Spertus et al., 2003) are measuring emotional abuse with the Childhood Trauma Questionnaire (CTQ; Bernstein et al., 1994)[1], a measure that treats emotional abuse as separate from emotional neglect.

Prevalence estimates for emotional abuse range from 12% – 46% depending both on the sample and the definition used (Edwards, et al., 2003; Medrano et al., 1999; Spertus et al., 2003). A recent study (Scher et al., 2004) consisting of 967 randomly sampled adults from metropolitan Memphis (36.1% male; ages 18 -65), found a lifetime rate of 12.1% for emotional abuse, third behind physical abuse (18.9%) and physical neglect (17.9%). Men reported less emotional abuse than women (9.6% v. 14.3%). Presently then, best estimates suggest that emotional abuse is hardly a rarity. This is unsettling given that emotional abuse has been found to correlate with diminished self-esteem (Mullen et al., 1996), aggression and delinquency (Vissing, Straus, Gelles, & Harrop, 1991), and risky health behaviours in youth (e.g., sexual intercourse at a younger age; Rodgers et al., 2004). Not only is emotional abuse predictive of an avoidant coping style (Krause, Mendelson, & Lynch, 2003), but there is emerging evidence to suggest a link between emotional abuse and early adolescent alcohol use (Dube et al., 2006). One large scale study found that pure emotional abuse (i.e., in the absence of physical and sexual abuse) increased the risk of frequent alcohol consumption (OR = 1.48) in a sample of 2,164 rural high-school students (54% male; 10^{th} to 12^{th} graders) (Moran, Vuchinich, & Hall, 2004). Furthermore, at least one study has demonstrated a relationship between

[1] Although earlier factor analytic work suggested a single factor incorporating both physical abuse and emotional abuse, subsequent analyses (Bernstein, Ahluvalia, Pogge, & Handelsman, 1997) and briefer versions of the measure (Bernstein et al., 2003) have demonstrated that these two constructs are indeed separate factors.

emotional abuse and both depression and PTSD (Spertus, et al., 2003). Specifically, in a female sample recruited from a primary care hospital, emotional abuse predicted both depression and PTSD even after controlling for the variance accounted for by both physical and sexual abuse (Spertus, et al., 2003).

Witnessing Domestic Violence

Domestic violence is regrettably all too common, with estimates that approximately 10 million Americans experience domestic violence each year (Schafer, Caetano, & Clark, 1998). Earlier research in the area suggested that half of all women and a third of all men murdered in the United States were killed by their partners (Browne & Williams, 1993). Data on domestic violence from the National Comorbidity Survey (Kessler, Molnar, Feurer, & Appelbaum, 2001) indicates that in a sample of 3,537 married or cohabitating men (1738) and women (1799), 18.4% of men and 17.4% of women reported that they were victims of minor physical violence (e.g., shoving, pushing), while 5.5% of men and 6.5% of women indicated that they had experienced severe domestic violence (e.g., kicking, hitting with a fist). Prevalence studies have ranged in their reports of domestic violence—from 0.01% to 21% (Jouriles, McDonald, Norwood, & Eszell, 2001). The discrepancy in these findings is often attributed to measurement issues specific to domestic violence—like whether the study was measuring violence that was male to female versus female to male, whether respondents were interviewed as individuals or in dyads, and whether the violence was minor or more severe—in addition to more generic sample differences (see Jouriles et al., 2001 for a review). Prevalence rates of children witnessing domestic violence are even less precise.

Witnessing domestic violence is now referred to in the literature as exposure to violence because exposure covers a broader series of contexts in which a child can be affected by domestic violence (e.g., hearing or observing the outcome of the violence but not seeing the violence; Fantuzzo & Mohr, 1999). Previously, prevalence rates of youth exposed to domestic violence (EDV) tended to be estimates based on extrapolation—e.g., Straus used retrospective survey data (1992) to estimate that about 10 million American youth were exposed to domestic violence each year—as opposed to more scientifically credible national prevalence data (Fantuzzo & Mohr, 1999). Recently though, some researchers (Fantuzzo, Fusco, Mohr, & Perry, 2007) have been working in conjunction with law enforcement agencies to use trained police to collect data on domestic violence and children's exposure to it. In one American municipality of approximately 900,000 people, over 5000 cases of domestic violence were substantiated across a three year period, and in just under half of these cases, children were present (Fantuzzo et al., 2007). Unfortunately though, population based studies are still in their infancy with respect to this topic.

The picture is somewhat clearer with respect to the consequences of EDV. With respect to the variables of interest in this research, there are a few studies to date that have examined that relationship between EDV and alcohol use (Anda et al., 2002; Dube et al., 2006). Retrospective cohort data from the Adverse Childhood Experiences (ACE) study has been used to investigate alcohol usage in two studies. Dube and colleagues (2006), who analyzed a subset of the data (8,417 adults; 54% female; average age = 56), reported that childhood exposure to mother battering increased the risk of early adolescent (OR = 2.0) but not late adolescent (OR = 1.2) initiation of alcohol use.

Similarly, Anda and colleagues (2002), analyzed a similar subset of the same data (N = 9,346; 54% female; average age = 56)[2], reported that childhood exposure to mother battering significantly increased the risk of self-identifying as an alcoholic (lifetime OR = 2.5). More research with a sample that does not draw from the ACE data needs to be conducted before firm conclusions can be drawn.

There is a great deal more evidence to substantiate a relationship between witnessing domestic violence and both depression (e.g., Anda et al., 2002; Straus, 1992; Teicher, Samson, Polcari, & McGreenery, 2006) and either subthreshold or diagnosable PTSD (Chemtob & Carlson, 2004; Graham-Bermann & Levendosky, 1998; Kilpatrick, Litt, & Williams, 1997; Lehmann, 1997) in children. Particularly, two meta-analytic studies of literature pertaining to the negative effects of EDV conclude that 35% to 65% of children demonstrate both negative internalizing and externalizing symptoms as a consequence of EDV (Kitzmann, Gaylord, Holt, & Kenny, 2003; Wolfe, Crooks, Lee, McIntyre-Smith, & Jaffe, 2003). Specifically, Kitzmann and colleagues (2003) observed that when it comes to consequences of domestic violence, there was a significant trend for PTSD effect sizes being higher than other internalizing disorders, while Wolfe et al. (2003) suggested that PTSD in particular appears to be a negative outcome with respect to younger children.

Physical Abuse

Rates of exposure to physical violence tend to be higher on the whole than sexual abuse, and higher for men than women (see Hanson et al., 2008). For example, in the

[2] Data from the ACE study was collected in two waves (Dube et al., 2006). The discrepancy between sample sizes for the Anda et al., 2003 and Dube et al., 2006 studies are a result of varying response rates between the two waves.

United States, the 1995 National Survey of Adolescents (N = 4,023) indicates a lifetime prevalence rate of 23% for physical assault, suggesting that roughly 5 million adolescents had been physically abused (Kilpatrick et al., 2000). Subsequent gender analyses of the same data set but with a slightly reduced participant count (N = 3,906)[3] revealed that the prevalence rate was 26.1% for boys and 18.8% for girls (Hanson et al., 2008). These results are comparable to those derived from a national sample of 935 adults (mean age = 46, 49.6% male) in which 22.2% of all males and 19.5% of all females reported that they had experienced some form of physical abuse before the age of 18 (Briere & Elliott, 2003). Canadian data appear to be comparable, as prevalence rates of lifetime physical abuse in the province of Ontario (N = 7016) were 29.9% for men and 21.2% for women (MacMillan et al., 2001).

Physical abuse and its associations with alcohol, depression, and PTSD are well documented. Kilpatrick et al. (2000), in analyzing data from the National Survey of Adolescents, reported that having a history of physical abuse increased the odds of having a diagnosis of an alcohol use disorder by 1.71, even after controlling for age, sex, race, family alcoholism, other forms of abuse, and PTSD. Other studies with adolescents have found that a history of physical abuse is associated with early initiation and heavier alcohol consumption for youth (Hamburger, Leeb, & Swahn, 2008; Shin, Edwards, & Heeren, 2009). For, example Southwick, Bensley, Spieker, Eenwyk, & Schoder (1999) collected data from a stratified sample of Washington State grade 8, 10, and 12 students (N = 4,790). They reported that those youth with a history of physical assault, compared to those without, were at an increased risk of both light-to-moderate and heavy drinking

[3] The slightly reduced participant account was attributable to removing participants who did not provide complete information on age, race, or ethnicity (Hanson et al., 2008).

if they were in grade 8 or 10, but not grade 12, since by grade 12 adolescent drinking was more normative regardless of physical abuse history. Furthermore, this relationship, at least for women, tends to persist into later periods of adulthood, as Duncan, Saunders, Kilpatrick, Hanson, and Resnick (1996) analyzed data from a USA nationwide sample of adult women (N = 4,008, average age = 49), and found that women with a self-reported history of physical abuse (before age 18) compared to non-abused women, were more likely to have had their first drink of alcohol at a younger age and were drunk on more days in the past year.

Physical abuse has also been consistently linked to depression in both adolescent (Kilpatrick et al., 2003) and adult clinical (Brown & Anderson, 1991) and community samples (Duncan et al, 1996). Recently, in a well-designed, matched, prospective study by Widom, Dumont, and Czaja (2007), children with a documented history of child abuse (time 1, abuse < age 11) were found to have an increased risk of a lifetime diagnosis of depression (OR = 1.59) in young adulthood (time 2, mean age of 28.7 years) compared to those without histories of physical abuse.

Interestingly, the relationship between physical abuse and PTSD in youth is surprisingly inconsistent. For example, in a small sample of inpatient adolescents (N = 89, ages 12 -18, 42% male), Sullivan, Fehon, Andres-Hyman, Lipschitz, and Grilo (2006) found that, when simultaneously examining the variance accounted for by several forms of abuse, only emotional abuse was related to PTSD symptom severity. Furthermore, this finding was consistent when using each PTSD symptom cluster as a dependent variable. In fact, quite a few studies have failed to find significant differences in the diagnostic status of PTSD based on physical abuse alone (e.g., Deblinger, McLeer, Atkins, Ralph, &

Foa, 1989; Pelcovitz, Kaplan, Goldenberg, Mandel, 1994; Kaplin et al., 1998), though see Dubner and Motta (1999) for an exception to this trend. National probability studies have also produced mixed results. An early national probability sample of 2000 adolescents (52% male) by Boney-McCoy and Finkelhor (1995) reported moderate to large effect sizes of parental violence on PTSD symptomatology in adolescent girls and boys (.45 and .73 respectively). On the other hand, results from the National Survey of Adolescents (Kilpatrick et al., 2003) suggested that while physical assault was predictive of PTSD that was comorbid with either depression or a substance use disorder, it was not predictive of noncomorbid PTSD.[4] Although the evidence for physical assault being linked to PTSD in adolescence is presently mixed, there is still a sufficient number of studies supporting the association (e.g., Bremner, Southwick, Johnson, & Yehuda, 1993; Duncan et al., 1996, Kessler, Davis, & Kendler, 1997; Zaidi & Foy, 1994) to include it as a variable in the present research.

Sexual Abuse

Estimates of sexual abuse vary greatly. For example, Finkelhor (1994) reviewed non-clinical, epidemiological studies of childhood sexual abuse (CSA) from 21 different countries. The review was conducted on literature from the 1970s to the 1990s, and his results indicated that prevalence rates ranged from 3% to 36% (Finkelhor, 1994). With respect to North America, CSA rates in Canada were 8% for men and 18% for women, while CSA rates in the USA were 16% for men and 27% for women. More recently, Pereda, Guilera, Forns, and Gomez-Benito (2009) conducted an updated version of Finkelhor's (1994) review. In their study, across 21 different countries, rates ranged from

[4] However, the authors suggest that this might in fact be due to the very low rate (1.4%) of noncomorbid PTSD in the sample (Kilpatrick et al.., 2003).

0% to 60% (Pereda et al., 2009). In Canada, rates were 4% for men and 13% for women, while in the USA rates ranged from 4% to 14% for men and 17% to 49% in women. However, there are two more recent studies with nationally-representative samples of adolescents that were not included in the most recent review conducted by Pereda and colleagues (2009), and these studies each reported CSA rates of 8.2% (Finkelhor, Ormrod, Turnery, & Hamby, 2005; Hanson et al., 2008).

The negative consequences of CSA are many and to document all of them is beyond the scope of this review. However, there is overwhelming evidence of a link between CSA and alcohol misuse, depression, and PTSD. An epidemiological study by Kilpatrick and colleagues (2000), using data on 3,907 adolescents from the National Survey of Adolescents, reported that a history of sexual assault increased the risk of having a past-year diagnosis of alcohol abuse/dependence by an odds ratio (OR) of 2.40 even after controlling for theoretically relevant variables like gender, family alcohol use, physical abuse, and PTSD. Like with physical abuse, early CSA can lead to earlier alcohol use and heavier drinking in adolescence (Bensley et al., 1999; Hamburger et al., 2008; Shin et al., 2009). Furthermore, a review of research with both clinical and community samples (Polusny & Follette, 1995) found that, for women, a history of CSA consistently increased the life-time prevalence of an alcohol use disorder compared to those without a history of CSA. For men, the results were less definitive, as one study found this difference while another did not (Polusny & Follette, 1995). With respect to depression and PTSD, Oddone Paolucci, Genuis, and Violato (2001) conducted a meta-analytic review of 37 studies published between 1981 and 1995 that examined the consequences of CSA. They calculated effect sizes (*d*; Cohen, 1988) on six discrete

outcome variables, and reported that CSA had a moderate sized effect on both lifetime depression (d = .44) and PTSD (d = .40). They interpreted these effect sizes to suggest that CSA increases rates of depression and PTSD by a minimum of 21% and 20% respectively. More recently, Hanson and colleagues (2008), also using data from the National Survey of Adolescents, reported complimentary findings in that sexual abuse increased the risk of having a past-six-months diagnosis of a major depressive episode (OR = 2.75) and of PTSD (OR = 5.71), though comorbidity between the two outcomes was not examined. Furthermore, contrary to previous findings (e.g., Horowitz, Weine, & Jekel, 1995), their analysis revealed that the risk of developing PTSD as a function of CSA was greater for boys (OR = 5.64) than for girls (OR = 2.14).

The above review suggests that emotional abuse, witnessing violence, physical abuse, and sexual abuse are not rare occurrences and that they increase the risk of negative behavioral outcomes (e.g., earlier alcohol consumption) and mental health outcomes (e.g., depression, PTSD) in adolescents. While the above review delineated the occurrence and outcome of each type of violence separately, there is evidence to suggest that poorer mental health outcomes are expected when different types of abuse are experienced by the same individual. For example, in a study with a large sample of adults (n = 7,505), individuals who reported experiencing a number of different types of EV (sexual abuse, physical abuse, and witnessing maternal battering) reported more mental health problems than those who had only been exposed to one type of violence (Edwards, Holden, Felitti, & Anda, 2003). Further to this finding, EV that occurs only in childhood is not nearly as prognostic of future negative outcomes (such as internalizing

problems, drug use, and alcohol related problems) as both adolescent-only and persistent EV (Thornberry et al., 2001).

Adolescent Alcohol Use

Normative and Problematic Use in Adolescence

The majority of adolescents try alcohol at least once (O'Malley, Johnston, & Bachman, 1998). Data collected in 2001 from the American-based Monitoring the Future Study (MTF) suggests that 51% of 8th graders, 70% of 10th graders, and 80% of 12th graders have had some experience with alcohol (Johnston, O'Malley, & Bachman, 2002). Most youth who try alcohol eventually use it for its intoxicating effect, and there is definitely a linear relationship between age and drinking to get drunk for adolescents, as MFS prevalence data collected from 2000 to 2008 on drinking to get drunk reveals that only 5.4% - 8.3% of 8th graders compared to 27.6% - 32.3% of 12 graders endorsed being intoxicated within a prior 30-day window (Johnston et al., 2009). Furthermore, MTF data collected in 2008 suggests that just under 50% of grade 12 students had been drunk at least once in their life (Johnston, O'Malley, Bachman, & Schulenberg 2009). Canadian rates are comparable, as data from the 2001-2002 version of the World Health Organization's Health Behaviour in School-Aged Children (HBSC) survey indicated that 43.7% of grade 10 students surveyed had admitted to being drunk at least twice in the past year (Boyce, 2004). Thus, adolescent experimentation with the intoxicating effects of alcohol seems to become more normative with age. Moreover, continued use is associated with several health risk behaviours, such as cigarette smoking, illicit drug use, and unsafe sex (Donovan & Jessor, 1985; Jackson, Sher, Cooper, & Wood, 2002; Strunin & Hingson, 1992), as well a variety of social issues like delinquency and school dropout

(Hawkins, Catalano, & Miller, 1992). In addition to these problems, early alcohol use (before the age of 14) increases the risk of suicidal behaviours (Swahn, Bossarte, & Sullivent, 2008, Wu et al., 2004) and later alcohol dependence (Hingson, Heeren, & Winter, 2006).

One of the more problematic drinking patterns that some adolescents engage in is drinking to get drunk, or binge drinking. Adolescent binge drinking is often defined as drinking 5 or more drinks in a sitting at least once every 2 weeks (Johnston, O'Malley, & Bachman, 2002). The National Survey on Drug Use and Health (Substance Abuse and Mental Health Services Administration, 2007) found that of the 10.8 million underage drinkers (ages 12 – 20) in the USA, nearly one fifth (18.8%) were binge drinkers. Although this figure includes college students, a demographic in which binge drinking is far more prevalent, data from the National Survey of Adolescents (Kilpatrick et al., 2000) show that 11% of 17 year old adolescents (i.e., high school aged) have an alcohol use (abuse/dependence) disorder, suggesting that heavy drinking is not merely an issue with college students. It is not surprising then that early onset drinking has been strongly associated with binge drinking (Hingson, Heeren, Zakocs, Winter, & Wechsler, 2003). As expressed by Monti et al. (2005), the long held belief that alcoholism was something that took years to develop is not supported, as current epidemiological data suggests that the period for the greatest risk of onset of an AUD is during the late teens and early twenties (Grant et al., 2004). It appears that adolescent binge drinking, in the presence or absence of early onset drinking, is a robust predictor of alcohol abuse or dependence in early adulthood (e.g., Hill, White, Chung, Hawkins, & Catalano, 2000).

There are two other reasons why heavy drinking amongst adolescents is of increasing concern. First, as adolescence is a period of continued neuroplasticity it is also becoming recognized as a period of vulnerability to neurotoxic processes, particularly those implicated in heavy alcohol use (Brown et al., 2008). There is emerging evidence that heavy drinking in adolescence is related to a variety of cognitive deficits, some that are specific to decision making and executive function, and others that are specific to the working memory and the retrieval of verbal and nonverbal information (Brown, Tapert, Granholm, & Delis, 2000; Goudriaan, Grekin, & Sher, 2007; Courtney & Polich, 2009). Second, and most gravely, heavy alcohol consumption by adolescents has been repeatedly linked to unsafe driving practices and fatal injuries from motor vehicle accidents (National Highway Traffic Safety Administration, 1997; Zakrajsek & Shope, 2006). In summary, heavy alcohol use during adolescence can have both immediate and long term consequences, consequences that range from the regrettable (e.g., sexual indiscretions) to the fatal (e.g., suicide).

Reasons for Adolescent Alcohol Use

There are a variety of factors that predispose or contribute to pre-college adolescent alcohol consumption. Some of the more studied externally situated factors include parent alcohol use (Brook, Whiteman, Gordon, & Brook, 1986; Ellickson & Hays, 1991), positive parental attitudes towards alcohol over and above what can be explained by parental alcohol use (Ary, Tildesley, Hops, & Andrews, 1993; Hawkins, Catalano, & Miller, 1992), and sibling and peer alcohol use (Hawkins et al., 1992; Hopfler, Crowley, & Hewitt, 2003; Scheier, Botvin, & Baker, 1997; Simons-Morton & Chen, 2005). Of the many internal factors that have been shown to predispose some

adolescents towards alcohol use, the more researched predictors include genetic predisposition (see Hopfler et al., 2003 for a review), low executive functioning (Deckel, 1999; Deckel & Hesselbrock, 1996; Kim, Kim, & Kwon, 2001), externalizing behavioural disorders like oppositional defiant disorder, conduct disorder, and ADHD (King, Iacono, & McGue, 2004; McGue et al., 2001; see Clark & Winters, 2002 for a review), internalizing disorders like depression and anxiety (Crum, Storr, Ialongo, & Anthony, 2008; Kaplow, Curran, Angold, & Costello, 2001; see Clark & Winters, 2002 for a review), personality variables like anxiety sensitivity (Comeau, Stewart, & Loba 2001) or traits like sensation seeking and aggression (see Hittner & Swickert, 2006 and White, 1997 for respective reviews), and expectations about the effects of alcohol ("expectancies"; Christiansen, Smith, Roehling, & Goldman, 1989; Smith, Godlman, Greenbaum, and Christiansen, 1995). As reviewed above, alcohol use becomes more normative in later stages of adolescence, and there is emerging evidence that expectancies about alcohol become more positive throughout these later stages as well (Schell, Martino, Ellickson, Collins, & McCaffrey, 2005). While research on expectancies has increased the field's understanding of some of the psychological determinants for adolescent alcohol use (Goldman, Del Boca, & Darkes, 1999), youth do not drink based solely on what they expect the outcome will be (Cooper, 1994), they drink because they are motivated to drink.

The difference between expectancies and motives can be succinctly expressed as follows: "expectancies are people's beliefs about what will happen if they (or other people) drink alcohol, motives are the value placed on the particular effects they want to achieve, which motivate them to drink" (Cox and Klinger, 2004, p. 124). Some drinking

motive theorists suggest that drinking activity is embedded in the multitude of environmental, interpersonal, and intrapersonal factors listed above, but that ultimately drinking motives represent the individual's choice (conscious or unconscious) and thus the final path towards alcohol use (Cox & Klinger, 1988; Kuntsche, Knibbe, Engels, & Gmel, 2007). In support of this contention, drinking motives have been found to mediate the relations between predictor variables like personality factors and alcohol expectancies and alcohol-behaviour- related outcome variables (Catanzaro & Laurent, 2004; Cooper, Frone, Russell, & Mudar, 1995; Kuntsche et al., 2007). Research has supported the contention that there are four drinking motives relevant to adolescents: enhancement, social, coping, and conformity (Cooper, 1994; Kuntsche, Knibbe, Gmel, & Engels, 2006), and this four factor model holds for youth amongst many (Kuntsche, Stewart, & Cooper, 2008) but not all (see Mushquash, Stewart, Comeau, & McGrath, 2008) cultural groups. Although most adolescents report drinking because of the pleasurable and sociable aspects that can come with intoxication, a sizable minority of adolescents report that they drink to escape their problems (O'Malley, Johnston, & Bachman, 1998). Adolescence provides no shortage of problems that might motivate youth to engage in drinking to escape; however, as outlined in the above review on exposure to violence, one "problem" that has been consistently linked to adolescent alcohol use/misuse is EV.

Negative Reinforcement Theories for Alcohol Use

The relationship between childhood EV and adolescent alcohol use/misuse, as reviewed earlier, holds regardless of the type of abuse. However, depending on the type of abuse (e.g., physical or sexual) and the type of alcohol outcome (e.g., early initiation, heavier use), odds ratios vary. However, these odd ratios increase considerably when

combined forms of abuse are recorded (e.g., Bensley et al., 1999; Hamburger et al., 2008; Shin, Edwards, Heeren, & Amodeo., 2009). In earlier years, abuse researchers—who then mainly focused on CSA—accumulated a wealth of information on its negative outcomes (like substance misuse more generally), but there was a dearth of explanatory models linking abuse to its sequelae (e.g., Finkelhor, 1988). Soon though, many of the sequelae of abuse—particularly alcohol and substance misuse—came to be explained as avoidant behaviours motivated by the desire to reduce tension (Briere, 1992; Briere & Runtz, 1993; Polusny & Folette, 1995). It was argued that abused individuals, in their attempt to alleviate the negative abuse-related internal experiences (e.g., fear, anxiety) that accompany negative memories of the abuse, are likely to resort to behaviours that offer immediate cessation or reduction of the aversive state. The tension reduction model, first attributed to Conger (1956), has been used to explain alcohol use more broadly (i.e., without a history of CSA). Its validity is contingent upon researchers being able to demonstrate that a) alcohol has tension relieving properties, and b) people learn to drink alcohol for these tension relieving properties. For a variety of reasons (e.g., the numerous ways in which tension has been operationalized), support for the tension reduction model has been mixed (for a review see Young, Oei, & Knight, 1990).

Thus, researchers moved away from measuring tension and began to focus on a more narrowly defined construct, stress. Stress has been defined as the appraisal or interpretation of an event signaling harm, loss, or threat (Lazarus & Folkman, 1984). Stress has been operationally measured by psychophysical responses like an elevated heart rate (HR), increased sweating / galvanic skin response (GSR), and muscle tension, or self-reported anxiety symptoms (see Sayette, 1999 for a review). In laboratory based

experiments, alcohol has been shown to attenuate these stress responses (e.g., Levenson, Sher, Grossman, Newman, & Newlin, 1980; Sayette, Breslin, Wilson, & Rosenblum, 1994). Thus, a more specific variation of the tension reduction model is called stress response dampening (SRD; Levenson et al., 1980). The functional relationship between EV and alcohol related intoxication becomes clearer when the SRD effect is understood within the context of specific forms of psychopathology.

Stress Responses

Posttraumatic Stress Disorder (PTSD)

PTSD is a complicated anxiety disorder that involves exposure to a traumatic event. Included in the DSM-IV (APA, 1994) definition of a traumatic stressor (A1) is any event that is experienced or witnessed that involves actual or threatened death/serious injury, or a threat to the physical integrity of the self or another. If exposure to the traumatic event is accompanied by a sense of fear, helplessness, horror (A2), it is quite possible that the individual will go on to develop PTSD, which is marked by three key symptom clusters: (1) avoidance of trauma-related reminders and emotional numbing, (2) hyper-arousal involving hyper-vigilance and increased physiological arousal, and (3) re-experiencing of the trauma (e.g., flashbacks and nightmares). It is important to note at the outset that there is little empirical support for this 3-symptom cluster conceptualization. Asmundson, Stapleton, and Taylor (2004) summarized the literature on both exploratory and confirmatory factor analyses (EFA and CFA) of instruments used to measure PTSD symptoms and conclude that most EFA studies support a four-factor model, where avoidance and numbing represent separate factors. Furthermore, when researchers have used CFA to compare both three- and four- factor solutions, there

is almost no support for the three-factor model described in the DSM-IV (though see Anthony, Lonigan, & Hecht, 1999 for an exception), but a great degree of support for the four-factor model (e.g., Palmieri & Fitzgerald, 2005; Palmieri, Weathers, Difede, & King, 2007).

Although it has taken several years for clinical researchers to settle on a nosolgical description that best accounts for PTSD related sequelae, what has been clear from the outset is that PTSD is different from other anxiety disorders in that it requires a known causal event—exposure to a trauma (A1)—in order to be diagnosed. Thus, because trauma can happen at any time, compared to other anxiety disorders, PTSD has the latest and most variable age of onset (Kessler, Ruscio, Shear, & Wittchen, 2008). Furthermore, compared to the other anxiety disorders, prevalence rates of PTSD can be difficult to ascertain because epidemiologists must record both the particular types of trauma exposure and the rates of PTSD of those exposed to these traumas, with the caveat that conditional risk of PTSD among people exposed to trauma varies greatly by the type of trauma (Kessler, 2000). With respect to traumatic exposures, a national survey in the USA found that 60.7% of men and 51.2% of women reported exposure to at least one traumatic event, with most respondents reporting that they had experienced more than one type of trauma (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). However, EV does not guarantee that an individual will go on to develop PTSD.

Presently, there is one report from a USA-based epidemiological survey that evaluated the risk of PTSD as a function of specific types of traumatic exposures in a randomly selected, representative sample of young adults (ages 18-44) living in Detroit (Breslau et al., 1998). The report concluded that conditional risk of PTSD after exposure

to any traumatic event is 9.2%, with assaultive violence (e.g., rape, physical attack) producing the highest conditional risk (20.9%) and learning about another's trauma producing the lowest conditional risk (2.2%). The National Comorbidity Study (Kessler, Berglund, Demler, Jin, & Walters, 2005) puts the lifetime estimate of PTSD (DSM-III-R) at 7.8%.

With respect to prevalence rates in USA adolescents, one non-representative, community-based study with a mixed gender sample (194 males and 190 females) of 18 year olds (99% Caucasian) showed that 43.0% had been exposed to at least one trauma, and that 14.5% of these youth, or 6.3% of the total sample, qualified for a DSM-III-R (APA, 1987) diagnosis of PTSD (Giaconia, et al., 1995). In this sample, although males and females were equally likely to have experienced a trauma, females were six times more likely to develop PTSD. These figures are not strikingly dissimilar from those of a USA nationally representative sample of 3,096 adolescents (2,002 males and 1,904 females, between the ages of 12-17), in which the prevalence of lifetime PTSD—DSM-IV (APA, 1994) definition—was 8.1% (Kilpatrick & Saunders, 1999), and current PTSD (within 6 months) was 4.9% (Kilpatrick et al., 2003).

Functional Relationship between PTSD and Alcohol Use

As reviewed earlier, there is a strong relationship between PTSD and alcohol use. The earlier articulated stress response dampening (SRD) theory has lead to a stimulating theory about a potential functional relationship between PTSD and alcohol use. The pathophysiological effect of PTSD is that it dysregulates the stress response, as observed by the onset of or changes in the following: hyperarousal, anxiety, tachycardia, increased diastolic blood pressure, and diaphoresis (Krystal & Neumeister, 2009). Evidence

suggests that changes in both the catecholamine norepinephrine (NE) and corticotropine-releasing hormone (CRH) underlie the changes in arousal (Kasckow, Baker, & Geracioti, 2001; Strawn & Geracioti, 2008; Vale, Vaughan, & Perrin, 1997). As such, their roles in PTSD are being widely explored (Baker et al., 2005; Bremner Southwick, Darnell, and Charney, 1996; Heim, Newport, Bonsall, Miller, & Nemeroff, 2001; Kosten et al., 1987; for review see Southwick et al., 1999). More specifically, stress has been shown to increase CRH in the locus coeruleus, which can lead to an increase in NE turnover in the hippocampus, hypothalamus, amygdala, and the prefrontal cortex (Dunn & Berridge, 1990; Valentino, Foote, & Aston-Jones, 1983), brain structures that are consistently implicated in PTSD-related stress dysregulation (O'Donnell, Hegadoran, & Coupland, 2004; Rauch, Shin, & Phelps, 2006; Shin et al., 2006). Of great relevance is that noradrenergic dysregulation has also been observed during states of withdrawal from chronic self-administration of alcohol (Hawley, Major, Schulman, & Linnoila, 1985; Smith, Brent, Henry, & Foy, 1990). Based on an earlier proposal by Koob (1999), Jacobsen, Southwick, and Kosten (2001) have suggested that a feed-forward interaction between CRH and noradrenergic systems may help explain the comorbidity of PTSD and alcoholism, since "stress, including stress related to withdrawal from substances, may stimulate CRH release in the locus coeruleus, leading to activation of the locus coeruleus and release of NE in the cortex, which in turn may stimulate the release of CRH in the hypothalamus and amygdala" (Jacobsen et al., 2001, p. 1188). Specifically, they suggest that individuals with PTSD might misuse central nervous system depressants like alcohol to temporarily interrupt this feed-forward interaction because alcohol can suppress activity in the locus coeruleus (Jacobsen et al., 2001).

Consistent with this theory, there is emerging evidence that individuals with PTSD misuse alcohol because they expect it to decrease their level of stress. For example, a study by Ullman, Filipas, Townsend, and Starzynski (2005), with a sample of women who had been sexually assaulted as adults ($N = 865$), provided findings that are consistent with this hypothesis. PTSD symptoms were related to self-reports of drinking to cope with stress as well as tension reduction alcohol outcome expectancies (i.e., beliefs that alcohol consumption leads to tension reduction outcomes). Furthermore, lab-based research using a trauma-cue-exposure paradigm (Coffey, Stasiewicz, Hughes, & Brimo, 2006), has demonstrated with a small sample ($N = 43$) of individuals with both PTSD and alcohol dependence, that trauma-focused imaginal exposure therapy but not imagery-based relaxation led to a decrease in both distress and alcohol cravings, providing evidence that for these individuals, trauma related distress had been contributing to an elevation in alcohol cravings.

The CRH-noradrenergic feed-back system is only one of several other systems (e.g., dopaminergic and seratonergic systems) implicated in the complex relationship between PTSD and alcohol use disorder comorbidity. Nonetheless, it is an important system because while the stress response dampening (SRD) theory helps explain how comorbidity can begin (i.e., in attempt to self-medicate), the feed-forward model explains how PTSD symptoms might maintain alcohol misuse since withdrawal from alcohol use is likely to worsen PTSD symptoms (by activating shared neural circuitry), thus driving more drinking behaviour, creating a cycle described as 'mutual maintenance' by some researchers (e.g., Stewart, 1996). Relatedly, the use of alcohol to control PTSD symptoms may cause further dysregulation of biological stress response systems (De

Bellis, 2002), interfering with the body's natural habituation to traumatic memories. As such, alcohol misuse can actually serve to maintain PTSD symptoms in the longer term: creating a "vicious cycle" between PTSD symptoms and alcohol misuse. However, this is not the only pathway to explain the link between PTSD and alcohol misuse, and indeed substance misuse more broadly.

Two other pathways that have also been used to explain the link between PTSD and alcohol misuse are the *High-risk hypothesis* and the *Susceptibility hypothesis*. The High-risk hypothesis suggests that misusing substances is a high-risk behaviour that increases the risk of developing PTSD due to a "dangerous/risky lifestyle." The Susceptibility hypothesis accounts for the comorbid relationship because substances like alcohol can cause physiological and neurochemical changes that make an individual more susceptible to developing PTSD following exposure to a trauma (Brown & Wolfe, 1994). Given the limited empirical support for the latter two pathways, and the fact that the onset and severity of substance misuse tends to co-occur with the onset and intensification of PTSD symptoms (Bremner et al., 1996; Chilcoat & Menard, 2003), most research on PTSD-alcohol comorbidity suggests that the self-medication / mutual maintenance theories best account for the functional relationship between PTSD and alcohol misuse (Conrod, & Stewart, 2003; De Bellis, 2002; Chilcoat & Breslau, 1998; Stewart, 1996; Stewart, Mitchell, Wright, & Loba, 2004).

Functional Relationship between Depression and Alcohol Use

It is important to note that the literature on alcohol misuse and comorbidity also attests to a strong relationship between depression and alcohol misuse in both (USA-based) nationally representative community samples (e.g., Grant et al., 2004) and

adolescent samples (Rohde, Lewinsohn, & Seeley, 1996). Hall and Farrell (1997) reported that for those with alcohol problems, the most prevalent cluster of comorbid disorders, next to anxiety disorders (19%), are mood disorders (13%). Childhood EV is strongly predictive of major depression (Kessler et al., 1997; Kendler et al., 2000), and physical abuse in particular has been shown to be predictive of both major depressive disorder (MDD) and AUDs in adolescents (Clark, De Bellis, Lynch, Cornelius, & Martin 2003). Some research on depression and alcohol use disorder (AUD) comorbidity demonstrates that the development of depression, like PTSD, more frequently precedes the development of an AUD (Kuo, Gardner, Kendler, & Prescott, 2006). However, some researchers have found the opposite and have suggested that depression is the consequence of chronic heavy drinking and/or alcohol withdrawal (e.g., Schuckit et al., 1997). Given that some evidence indicates depression as a precursor to alcohol misuse (e.g., Kuo et al., 2006), any examination of potential mediating variables between EV and alcohol misuse should include measures of both PTSD and depression.

First Nations Context

EV and subsequent alcohol misuse are frequently linked together across cultural groups, and each is a concern for many Canadian communities. Although there is very little published literature that either reports on or explores the connection between EV and alcohol misuse in First Nations' communities, the published research that is available seems to suggest that rates of both violence exposure and alcohol use/misuse are high in some communities (Health Canada, 2003). For example, the 1991 Statistics Canada Aboriginal People's Survey revealed that 62% of First Nations respondents reported that alcohol was a problem in their community, while 39% of respondents reported that

family violence was a problem in their community (Indian and Northern Affairs Canada, 2004). However, there is a complex web of ecological factors that contribute to the maltreatment-substance abuse issue in this cultural group. For example, a study by Blackstock, Trocmé, and Bennett (2004) found that Aboriginal families, compared to non-Aboriginal families, report higher rates of substance abuse but also face worse socioeconomic conditions. Poor socioeconomic conditions, substance abuse, and poor parenting skills (e.g., neglect and abuse) are problems that are now well understood to be consequences of a history of colonization. One of the most notorious manifestations of this dark history was the residential school system, which has had immeasurable deleterious consequences on Aboriginal health, culture, and identity (Indian and Northern Affair Canada, 1996).

In its attempt "to transport Aboriginal children through the classroom to the desired assimilative destination," the system often produced individuals who felt marginalized from both their home communities and the communities of their colonizers, leaving many with few constructive alternatives to a life of prostitution and/or alcoholism (Indian and Northern Affairs Canada, 1996). Furthermore, the structure sowed the seeds for generational cycles of family violence because these schools disrupted the transference of parenting skills from one generation to the next, leaving many survivors to rely on the lessons they learned at these schools: that adults often maintain power, control, and obedience through abuse (Indian and Northern Affairs Canada, 1996). Many cases of sexual and physical abuse went ignored and unhealed, giving rise to numerous unhealthy coping behaviours in the survivors—including the perpetration of violence (Wesley-Esquimaux & Smolewski, 2004). These coping behaviours often became

"normal" and were then passed-down to subsequent generations, resulting in intergenerational or multi-generational trauma (Wesley-Esquimaux & Smolewski, 2004).

Although the author of this research recognizes the historical and cultural roots to the interrelationship of EV and alcohol misuse in some Aboriginal communities, the present body of work was not designed to test the contribution of these historical factors. Rather, the research focused on the more immediate experiences of trauma in one Nova Scotian, First Nation community. Specifically, the first study examined how a lifetime history of EV among school attending Mi'kmaq adolescents might be related to drinking behaviours by way of known mental health sequelae of maltreatment such as posttraumatic stress (PTS) and depressive symptoms. In other words, this research sought to examine whether or not there was support for the self-medication hypothesis in the sample by exploring whether or not PTS or depressive symptoms mediated the relationship between EV and subsequent alcohol misuse.

The literature is for the most part consistent with respect to whether or not PTSD mediates the relationship between EV and PTSD, with most studies finding confirmatory evidence (e.g., Epstein, Saunders, Kilpatrick, & Resnick, 1998) but a few not (e.g., Prigerson, Maciejewski, & Rosenheck, 2002). Although this literature is reviewed more thoroughly and critically in the following chapter, it needs to be pointed out that the present research is the first documented attempt to explore this research question in a collaborative research endeavour with a First Nation community. The decision to explore our research question in this community emerged both from both a community identified need as well as a scientifically informed perspective. The basic methodology is presented below, as a complement to the Method sections in chapters 3 and 5.

General Methodology

The community that collaborated with our research group is a self-governing Mi'kmaq (First Nations) Community. It is one of the largest First Nations communities in Atlantic Canada, and its origins go back to the first half of the 19th century. It is self-governed by its own Band Council and has its own Board of Education and Board of Health. After receiving both community consent and ethical approval (from the Mi'kmaw Ethics Watch and Dalhousie University Human Research Ethics Board) the data were collected in April of 2006. The process of gaining community consent is documented more thoroughly in a publication by our research group (Zahradnik, Stevens, Stewart, Comeau, Wekerle, & Mushquash, 2007), and referred to in more detail in chapter 7 of the present work. As this was a school-based collaboration, only adolescents attending either of the two high schools in the community were invited to participate. Due to the concern that using an active parent/guardian consent process could result in a possible sample bias, in that students who were being exposed to parental/guardian violence would be less likely to have parental consent to participate in the study, a passive parent/guardian consent process was implemented. School staff used school records, school history, and professional judgment to assess whether or not students had the capacity to give informed consent themselves. All student participants were at least 14 years of age, and able to read English, although school staff who were fluent in both English and Mi'kmaq were on hand at all times during data collection to assist in translation of key words if necessary. Overall, 166 students participated in the study, which is just over half the number of students enrolled at the beginning of the academic year. The school was not able to provide the research team with records, but variables

that likely affected student participation were dropout (it is typical for one of the two schools to lose 30 to 50% of its students to drop out by spring), student absenteeism on the day of testing, competing class activities at the time of testing, and lack of student interest. The gender breakdown of the sample was comparable to the total number of boys and girls at both schools.

In addition to being active participants in the research design process, community stakeholders and relevant agencies (e.g., Mental Health and Social Work Services [MH&SWS]) were given two weeks' notice prior to the actual days of data collection. By way of a school-distributed passive consent letter, parents/guardians were informed about the purpose, tasks, and risks of the study at least two weeks prior to its commencement. Students were made to understand that all information provided on the self-report forms would be anonymous as long as they did not share their answers with any of the researchers, staff, or students. Because data were collected in groups (by class), to increase anonymity, students were randomly administered one of three different versions of the self-report questionnaires, identical with respect to content, but different with respect to the order of the questionnaires. Students were informed that guidance counsellors and teachers were available upon request, and that service providers from MH&SWS had made arrangements to attend to any students who sought services as a consequence of participating in the study. No students sought out these services. Detailed information about the self-report measures used and sample characteristics are reported in detail in chapters 3 and 5.

CHAPTER 2. PROLOGUE TO POSTTRAUMATIC STRESS HYPERAROUSAL SYMPTOMS MEDIATE THE RELATIONSHIP BETWEEN CHILDHOOD EXPOSURE TO VIOLENCE AND SUBSEQUENT ALCOHOL MISUSE IN MI'KMAQ YOUTH

As outlined in the previous chapter, if the tension reduction and SRD models are correct about the relationship between EV and alcohol misuse, then these models suggest that individuals with EV histories are learning to drink to dampen their EV-related anxiety/stress reactions. EV can give rise to numerous types of anxiety symptoms/disorders (e.g., panic attacks/disorder), but one of these in particular—PTSD—has garnered much attention, especially with respect to alcohol misuse. There have been several attempts to demonstrate that PTSD mediates the relationship between some form of EV and some form of alcohol misuse, most of which have demonstrated at least partial mediation. The first study to examine this question (Epstein, Saunders, Kilpatrick, & Resnick, 1998) used path analytic techniques with a sample of 2,994 women to show that PTSD mediated the relationship between childhood rape and subsequent alcohol abuse; however, this study relied heavily on retrospective memory since the average age of the sample was 44 years, and questions were being asked about victimization that occurred prior to age 18. White and Widom (2008), using a prospective design with a sample of 582 women who had a court-documented history of child abuse and neglect, used the procedure recommended by Baron and Kenny (1986) to test mediation. When PTSD in young adulthood (*M* age = 29) was tested as the only potential mediating variable, it was found to partially mediate the relationship between early child abuse and neglect (up to age 11) and later alcohol use in middle adulthood

(age $M = 40$). Prigerson, Maciejewski, and Rosenheck (2002) also tested the same question in a sample of male combat veterans ($N = 2578$), but they failed to find any evidence that PTSD mediated the relationship between combat exposure and subsequent substance abuse—both alcohol and drug—problems. However, their study did not differentiate between alcohol and illicit drug use, limiting their ability to study unique pathways based on distinct outcome variables. Furthermore, their study measured PTSD categorically (present or not present) as opposed to continuously, and therefore could not investigate whether or not the severity of PTSD symptoms were related to the subsequent severity of later substance misuse (Stewart, 1996). Measuring PTSD categorically may also explain why Zlotnick et al. (2006) found only weak support for PTSD acting as a partial mediator between childhood physical assault (but not childhood sexual assault) and number of days abstinent in a predominantly male sample of ($N = 336$) patients with alcohol abuse or dependence.

None of these studies examined whether or not specific symptom clusters of PTS (e.g., hyperarousal) might be responsible for these mediating effects. The study below was designed to determine which of the PTSD symptom clusters best accounts for this mediating effect. Given the aforementioned support in the literature for PTSD as a mediator between traumatic events like EV and alcohol misuse, and so as to reduce the number of redundant tests, a test with total PTS symptoms as the mediator was not conducted. Furthermore, the reader is requested to pay attention to how the terms posttraumatic stress disorder (PTSD) and posttraumatic stress (PTS) are used in the following work. PTSD is used when citing material by other researchers who have employed this term to describe their empirical findings or theories about the construct of

PTSD, while PTS is used to discuss the findings of the study described below, since the methodology precludes the use of diagnostic labels.

CHAPTER 3. STUDY 1. POSTTRAUMATIC STRESS HYPERAROUSAL SYMPTOMS MEDIATE THE RELATIONSHIP BETWEEN CHILDHOOD EXPOSURE TO VIOLENCE AND SUBSEQUENT ALCOHOL MISUSE IN MI'KMAQ YOUTH[5]

Abstract

This study was part of a school-based collaborative research project with a Canadian Mi'kmaq community that examined the potential role of posttraumatic stress (PTS) symptom clusters in mediating the relationship between childhood exposure to violence (EV) and alcohol misuse in a sample of Mi'kmaq adolescents ($N = 166$). The study employed a cross-sectional design and used several well-validated self-report questionnaires. Path analytic results showed that when each PTS symptom cluster was independently investigated for mediating effects, while controlling for depressive symptoms, age, and gender, only the PTS hyperarousal symptom cluster fully mediated the EV—alcohol misuse relationship. Results are discussed within the context of previous theory and research on the topic of PTS as a mediator between EV and alcohol misuse.

[5] Adapted from Zahradnik, Stewart, Sherry, Stevens, and Wekerle, "Posttraumatic stress hyperarousal symptoms mediate the relationship between childhood exposure to violence and subsequent alcohol misuse in Mi'kmaq youth," submitted to the *Journal of Traumatic Stress*. As first author of this manuscript I contacted the community to initiate collaboration; I contributed to the design of the study; I collected all of the data; I managed the data-base and conducted the majority of the data analyses; and I wrote the manuscript and then made revisions based on feedback from my coauthors.

Introduction

Interpersonal violence, whether experienced directly or indirectly, especially during childhood, can either precipitate the onset of posttraumatic stress disorder (PTSD[6]) or act as a risk factor that later increases the odds developing PTSD after subsequent traumas (Brewin, Andrews, & Valentine, 2000). Unfortunately, youth exposure to violence (EV) is not rare. Two American studies (Finkelhor, Ormrod, Turnery, & Hamby, 2005; Hanson et al., 2008) using nationally-representative samples of youth suggest that one-fifth to one-half of all children and adolescents have experienced a physical assault, while a little over one-third have witnessed violence perpetrated toward another, and almost one-tenth have been sexually victimized. These figures are particularly alarming since EV increases the risk of developing PTSD over-and-above other types of traumatic events (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Kilpatrick et al., 2000). Furthermore, not only is EV more likely to either result in PTSD or become a risk factor for the later onset of PTSD after a subsequent trauma, but EV is also more likely to predict the development of PTSD with co-morbid substance misuse (Wekerle & Wall, 2002).

There are well-documented relationships between childhood maltreatment and both PTSD and alcohol abuse/dependence (Langeland, Draijer, Nel, & van den Brink, 2004). Moreover, much of the research indicates that PTSD symptoms and alcohol misuse are commonly "comorbid" (Stewart, 1996) – that is, they occur together in the same individuals far more commonly than can be explained by chance. Studies show that

[6] This study refers to both posttraumatic stress disorder (PTSD) and posttraumatic stress (PTS). The term PTSD is used when referring to the literature that employed this diagnostic label, but as we did not measure diagnostic status in this study, we employ the term PTS when referring to the construct we have measured.

the lifetime prevalence rate of having an alcohol use disorder (abuse or dependence) for those with PTSD ranges from 21.6-51.9% but only from 8.1-34.4% for those without PTSD (Breslau, Davis, Peterson, & Schultz, 1997; Kessler et al., 1995).

While there are a number of possible explanations for the comorbidity of PTSD and alcohol abuse/dependence, many researchers suggest that those with PTSD misuse alcohol (or other substances) in order to "self-medicate" their PTSD symptoms (De Bellis, 2002; Chilcoat & Breslau, 1998; Stewart, Mitchell, Wright, & Loba, 2004). The self-medication theory argues that central nervous system depressants like alcohol may help attenuate certain fear/startle responses as well as the intrusive memories that are characteristic of PTSD (Jacobsen, Southwick, & Kosten, 2001). The relationship between PTSD symptoms and alcohol misuse can become further complicated by a process known as "mutual maintenance" (Stewart, Pihl, Conrod, & Dongier, 1998). Although an individual receives initial PTSD symptom relief immediately following the consumption of alcohol, once its effects have worn off the PTSD symptoms return. Some of those symptoms, particularly hyperarousal, can return with even greater severity, largely due to the physiological arousal relating to withdrawal from central nervous system depressants like alcohol (Jacobsen et al., 2001). This maintenance or intensification of PTSD symptoms then resets the stage for continued alcohol misuse, potentially causing further dysregulation of biological stress response systems (DeBellis, 2002), and interfering with the body's natural habituation to traumatic memories. In this way, alcohol misuse can actually serve to maintain PTSD symptoms in the longer term creating a "vicious cycle" between PTSD symptoms and alcohol misuse.

In essence, the self-medication/mutual maintenance theories suggest that PTSD acts as a mediating variable, that is, a variable that intervenes and helps explain the relationship between trauma exposure and subsequent alcohol misuse. Previous studies that attempted to show the role of PTSD as a mediator between a traumatic event and later alcohol misuse have shown weak to moderate support (Epstein, Saunders, Kilpatrick, & Resnick, 1998; White & Widom, 2008; Zlotnick et al., 2006) though a couple have shown no support (Prigerson, Maciejewski, & Rosenheck, 2002; Ullman, Filipas, Townsend, & Starzynski; 2005). However, none of these studies examined the potential mediating role of the individual PTSD symptom clusters.

In light of the relationships between the PTSD symptom clusters of hyperarousal (McFall, MacKay, & Donovan, 1992; Stewart, Conrod, Pihl, & Dongier, 1999; Stewart et al., 2004), reexperiencing (McFall et al., 1992; Read, Brown, & Kahler, 2004; Simons, Gaher, Jacobs, Meyer, Johnson-Jimenez, 2005) and avoidance and numbing (Sullivan & Holt, 2008; Taft et al., 2007) with alcohol misuse, it is important to examine the potential mediating role of each PTSD symptom cluster, since the self-medication model would predict that individuals exposed to violence might be drinking to cope with any of these symptoms (Stewart, 1996). However, an important variable to control for in the trauma – alcohol misuse relationship is depressive symptoms because of the strong relationships found between depressive symptoms and EV, depressive symptoms and alcohol misuse, and depressive symptoms and PTSD (Kessler, Davis, & Kendler, 1997; Kilpatrick et al., 2003).

The present study is also novel in that this is the first attempt to address this issue in both an adolescent sample and in partnership with an Aboriginal community.

Although the literature is scant, there is evidence to attest to the fact that some North American Aboriginal communities are facing severe issues that involve high rates of EV, PTSD, depressive symptoms, and alcohol misuse. For example, the Canadian Aboriginal People's Survey reported that 73% of Aboriginal respondents self-reported that alcohol was a problem in their community (Statistics Canada, 1991). From the same survey, 44% of respondents indicated that family violence was a problem in their community, while just over half indicated that both physical and sexual abuse were problems as well (Statistics Canada, 1991). Another study showed that approximately 40% of a sample of 234 American Indians reported exposure to severe child maltreatment, which was most strongly associated with PTSD over other psychological disorders (Duran et al., 2004). Other studies with American Indian populations have linked both childhood physical and sexual assault to both depressive symptoms and subsequent alcohol misuse (Libby et al., 2004, 2005). With respect to alcohol consumption, a recent literature review concluded that rates of alcohol use amongst American Indians and Alaskan Natives are higher than in the general population for both adults and adolescents, and that Native adolescents experience more negative consequences of their drinking than other adolescents (Szlemko, Wood, & Thurman, 2006). Thus, by working in partnership with a Mi'kmaq community (see Zahradnik et al., 2007), we attempted to address the question of PTS mediation with a community that is not alone in struggling with the issues highlighted.

We hypothesized that adolescents with higher amounts of EV are more likely to develop PTS symptoms, and these PTS symptoms are in turn more likely to lead to alcohol misuse, even after controlling for the influence of depressive symptoms. Consistent with current studies on how best to organize PTSD symptom clusters

(Asmundson et al., 2000; King, Leskin, King, & Weathers, 1998; Stewart et al., 1999) we specified four separate path models—hyperarousal, reexperiencing, numbing, and avoidance—in which it was predicted that in each model EV would be indirectly related to alcohol misuse through one of our four PTS symptom clusters. See Figure 3.1 for an example of the hypothesized medational model for PTS hyperarousal.

Method

Participants and Procedures

There are approximately 25,000 Mi'kmaq living in Nova Scotia. The Mi'kmaq makeup about 2.6% of the provincial population and there are 35 reserves administered by 13 self-governing communities. The community of focus in the current study is one of the larger communities; but given this community's request for anonymity, identifying information cannot be provided. A more general description of the community and the steps involved in acquiring community consent and participation in the research process is available (Zahradnik et al., 2007; Zahradnik, Stewart, O'Connor, Stevens, Ungar, and Wekerle (2010).

The sample was drawn from the community's school-attending youth, and data was collected in both the spring and the fall of 2006. Across the two schools, 166 students participated in the study, which is just over half of those that were eligible to participate. With respect to gender, there were 91 women and 75 men. Ages ranged from 14-18 years (M = 16.69, SD = 1.39), with most students (77.7%) being 16 years of age or older, the age at which according to Nova Scotian law (Children and Family Services Act, 1990) a child can choose whether s/he wishes to report a case of abuse where s/he

alone was the victim. The self-reported education level ranged from grades 8-12 (M = 9.91, SD = 1.05) (see Appendix A for Demographics and Substance Use Questionnaire).

Measures

Physical, sexual, and emotional abuse/exposure to domestic violence was measured with the Childhood Experience of Violence Questionnaire (CEVQ; Walsh, MacMillan, Trocmé, Jamieson, & Boyle, 2008; see Appendix B), an 18-item self-report measure of childhood EV for use with children/youth 12-18 years. The CEVQ collects information about whether abuse has been experienced and if so, about the severity (measured continuously), onset, and duration of abuse experienced. The reliability coefficient for this measure in our sample was high (α = .92). This is the first recorded use of the CEVQ with an aboriginal sample.

Posttraumatic stress symptoms were measured with the Child Post-Traumatic Stress Symptom scale (CPSS; Foa, Johnson, Feeny, & Treadwell, 2001; see Appendix C). The CPSS is a 17-item self-report measure designed to tap each of the three *DSM-IV* symptom clusters of PTSD—reexperiencing, avoidance/numbing, and hyperarousal—in children/youth from ages 8-18 years. In this sample, two of the CPSS subscales (numbing and reexperiencing) had unacceptably low Cronbach alphas (below .60) because of three problematic items: two items from the numbing subscale (item 8: traumatic episode related memory problems, and item 12: having a sense of a foreshortened future), and one item from the reexperiencing subscale (item 4: emotional reactivity to triggers). We did not include these items in our subscale totals.[7] Thus, our four subscales were as follows:

[7]Research on PTSD has identified these two numbing items as problematic (e.g., King et al., 1998). Thus, it is not unusual for some researchers to also drop these items

reexperiencing (4 items; e.g., nightmares; Cronbach's alpha = .72), hyperarousal (5 items; e.g., exaggerated startle response; Cronbach's alpha = .63), avoidance (2 items; e.g., avoiding thinking about the trauma; Cronbach's alpha = .71), and emotional numbing (3 items; e.g., feeling emotionally numb; Cronbach's alpha = .73). This is the first recorded use of the CPSS in an Aboriginal sample.

The 20 item Centre for Epidemiological Studies Depression Scale (CESD; Radloff, 1977; see Appendix D) was used to measure depressive symptoms. The CESD has been used previously with adolescents (Radloff, 1991). Summing all items yields one overall score ranging from 20-80 that reflects depressive symptom severity (present sample $\alpha = .84$). This scale has been well-validated in different samples of Aboriginal adolescents (Manson, Ackerson, Dick, Barón, & Fleming, 1990; Thrane, Witbeck, Hoyt, & Shelley, 2004).

Since evidence suggests measuring the problems that arise as direct consequences of alcohol consumption is a good indicator of alcohol use disorders in youth (White & Labouvie, 1989), the Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989; see Appendix E) was used to measure alcohol misuse. The RAPI is a well validated 23-item self-report measure that assesses adolescent problem drinking symptoms. It has been validated in community, clinical and First Nations samples (Noel et al., 2010; White & Labouvie, 1989; Winters, 1999). Responses were summed across the 23 items ($\alpha = .97$), as recommended by the authors of the RAPI, to yield a composite score that takes

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from their studies (e.g., Palyo, Clapp, Beck, Grant, & Marques, 2008). Furthermore, we felt it was justified to drop the reexperiencing item since its low internal consistency can be interpreted within the context of other findings that suggest that First Nations people are more likely to experience their anxiety somatically than emotionally (e.g., Barker-Collo, 1999).

problem frequency into account (cf. Winters, 1999). Forty percent of the participants reported not drinking and were given a score of zero for this measure.

Data Analysis

Missing data was determined to be missing at random Little's MCAR test and well within the range of acceptability to use expectation maximization (Gold & Bentler, 2000), and so missing data were imputed using Missing Values Analysis within PASW 17.0. Path analysis was conducted with AMOS 7.0 (Arbuckle, 2006). Depressive symptoms were controlled for in each model, and in accordance with convention for specifying control variables in path analysis, paths (single headed arrows) were specified from depressive symptoms to both the potential mediating variable (PTS symptom) and our outcome measure of alcohol misuse (see figure 1). Goodness-of-fit of structural models was evaluated via multiple indices. Adequate fit is indicated by a chi-square/ degrees of freedom ratio (χ^2/df) around 2, an incremental fit index (IFI) and a comparative fit index (CFI) around .95, and a root-mean-square error of approximation (RMSEA) around .08 (Kline, 2005). RMSEA values are reported with 90% confidence intervals (90% CI).

Mallinckrodt, Abraham, Wei, and Russell (2006) assert that a significant indirect effect suggests mediation has occurred. The significance levels of all indirect effects were tested using random sampling with replacement to generate 20,000 (n = 166) bootstrap samples. Bootstrapping allowed us to estimate bias-corrected standard errors for our indirect effects. Confidence intervals were also calculated, and indirect effects were considered significant ($p < .05$) if the 95% CI for these indirect effects did not contain zero.

Results

With respect to EV, based on the CEVQ's more stringent definitions of physical and sexual abuse (Walsh et al., 2008), 47% of the sample reported physical abuse, 34.3% of the sample reported sexual abuse, and 57.8% of the sample reported either physical or sexual abuse[8]. Please see Appendix F for a series independent t tests (EV vs. no EV) examining differences on depressive symptoms, the four PTS symptom clusters, and the RAPI. EV was moderately correlated with all four PTS symptoms, depressive symptoms, and alcohol misuse (see Table 3.1 for correlations, means, and standard deviations). Furthermore, both depressive symptoms and all four PTS symptoms were correlated with alcohol misuse. Age correlated with alcohol misuse and gender correlated with PTS reexperiencing and depressive symptoms. To account for their potential influence, age, gender and depressive symptoms were included as covariates in all structural models involving PTS symptom clusters as potential mediators.

Fit indices for structural models appear in Table 3.2. All four models fit the data reasonably well. However, when controlling for the effects of depressive symptoms in each of the four models, only one of the models, the PTS hyperarousal model, resulted in a significant relationship between the potential mediator and the outcome variable (ß = .27, $p < .05$; see Figure 3.1). For each of the other three models there were no significant relationships between the PTS symptom cluster and alcohol misuse once depressive symptoms were controlled for: reexperiencing (ß = -.01, $p > .05$); avoidance (ß = -.06, $p > .05$); and numbing (ß = -.04, $p > .05$). In contrast, the pathways from depressive

[8] Cutoffs for what might constitute levels of emotional abuse and exposure to domestic violence are not yet available for this measure and therefore percentage scores, for determining rates in the sample, are not available for these two subtypes of EV.

symptoms to alcohol misuse were significant in these models (ßs = .35, 36, and .37, respectively).[9] Consequently, only the indirect effect of EV on alcohol misuse through PTS hyperarousal was significant (see Table 3.3).

In summary, all four of the PTS symptom cluster models adequately fit the data. As hypothesized, PTS hyperarousal symptoms involved a significant indirect effect; however, indirect effects were not observed for the three other PTS symptom cluster models.

Discussion

Although prior studies have examined the role of PTSD as a mediating variable between some form of EV and alcohol misuse (Epstein et al., 1998; White & Widom, 2008; Zlotnick et al., 2006), this is the first study to examine the contribution of specific PTS symptom dimensions while controlling for depressive symptoms, which are known to be related to all three aforementioned variables (Kilpatrick et al., 2003). It is also the first study to provide support for the PTS-specific self-medication hypothesis by demonstrating mediation in a sample of Mi'kmaq (First Nation) adolescents. Our

[9] Given concerns about multivariate non-normality in our data, we used bootstrapping to address the possible effect of multivariate non-normality in our structural models (Schumacker & Lomax, 2010). All paths in each of the four structural models examining the potential mediating role of the PTS symptom clusters were re-examined using bootstrapping procedures. Paths generated using bootstrapping were virtually identical to the results shown in Figure 1 and summarized in text, suggesting multivariate non-normality had little or no influence on the results. Bootstrapping estimates are not presented in the main text because such estimates are excessively strict if significant deviations from multivariate normality are not present (Nevitt & Hancock, 2001). In sum, bootstrapping procedures suggested the results were not unduly influenced by possible deviations from multivariate normality.

findings supported an indirect relationship of EV to alcohol misuse through PTS hyperarousal symptoms, but not any of the other PTS symptoms.

That hyperarousal symptoms fully mediated the relation between EV and alcohol misuse is consistent with research linking PTSD hyperarousal symptoms to alcohol misuse (McFall et al., 1992, Simons et al., 2005, Stewart et al., 1999). With respect to the other PTS symptoms, although at the univariate level of analysis these symptom clusters were related to alcohol misuse, contrary to our hypothesis, they did not explain the relationship between EV and alcohol misuse after controlling for the influence of depressive symptoms. Although these null results were contrary to our hypothesis, we note not all studies examining the relationships between the PTSD symptoms and alcohol misuse report a significant univariate relationship (Stewart et al., 1999), let alone a multivariate one. Alternatively, other PTS symptoms, like reexperiencing symptoms, might better explain why EV can lead to misuse of drugs other than alcohol (McFall et al., 1992). Thus, future research might also use illicit drug use and/or misuse of prescription medications as outcomes, but researchers are cautioned not to group arousal-enhancing and arousal-dampening drugs together as mediation findings may be specific to arousal-dampening drugs (Stewart & Conrod, 2008).

The results of our study are consistent with other research in this area. For example, although this is the first study to report a sample mean for a total score of the CEVQ, our sample had slightly higher rates of abuse to a large community based study of high risk adolescents that examined the impact of abuse before age 10 on subsequent drinking; this prior study found that abuse increased the risk of ever using alcohol, preteen first age alcoholic drink, and binge drinking (Hamburger, Leeb, and Swahn,

2008). Our study also makes several novel contributions. It is the first study to examine the mediating effects of specific PTS symptom clusters, as opposed to examining the PTS construct as a whole (Prigerson et al., 2002; Ullman et al., 2005; White & Widom, 2008; Zlotnick et al., 2006). Furthermore, ours is the first study to show that even when controlling for the role of depressive symptoms—a construct with strong associations to alcohol misuse—PTS hyperarousal symptoms better explain the link between EV and alcohol misuse. In other words, those youth with a history of EV were more likely to misuse alcohol in relation to their hyperarousal symptoms (i.e., to dampen these symptoms) regardless of whether or not they would meet all the necessary criteria for a diagnosis of PTSD. Our results are also consistent with the theory of mutual maintenance in which bouts of alcohol consumption, used to dampen hyperarousal symptoms, can actually, by way of alcohol withdrawal, increase the severity of these very symptoms (Jacobsen et al., 2001); however, our design limits our ability to make causal inferences.

There are also important characteristics about our sample that make this study a valuable contribution. Our study is the first to find support for mediation effects of PTS symptoms in a sample of adolescents, and it is the first study to examine this question in a First Nations community. This is important because it is common for First Nations' communities, and North American Aboriginal communities more generally, given their history of colonization and cultural discontinuity (Kirmayer, Brass, & Tait, 2000), to be struggling with a variety of social issues (e.g., suicide, fetal alcohol syndrome, community violence, and child maltreatment) that are related to problematic alcohol use.

The results of this study might be of interest to Aboriginal communities looking to better understand a specific pathway that can lead to problematic alcohol use in their youth. However, the results of this study must be understood and interpreted within the greater socio-economic determinants of problematic alcohol use in Aboriginal communities, determinants that include poverty, unemployment, poor health, low educational levels, and low or absent community economic development (Health Canada, 1998).

A limitation of our study was that it was a school-based study that used a non-random sample. Subsequently, the sample is not necessarily representative and may not generalize to those community youth who are not enrolled in school, and who may be dealing with more severe sequelae of EV. Another important caveat is that this study relied on a cross-sectional design; thus, inferences must be made with caution regarding mediation and therefore causation, given the lack of information about temporal sequencing. This being said, most empirical evidence suggests trauma and PTS symptoms precede alcohol misuse in the majority of comorbid cases (Bremner et al., 1996; Chilcoat & Menard, 2003). Also of note, stressful life events are common in many First Nations communities (e.g., youth suicides or motor vehicle accidents). Thus, the expression of PTS symptoms as they were captured in this study may not be solely attributable to EV. While face-to-face interviews are an ideal way to disentangle the chronologies of multiple traumas as they relate to the development of PTS, our use of anonymous self-report measures made this impossible. Furthermore, our sample size precluded us from examining the models with pure cases of one form of abuse (e.g., sexual abuse alone); however, two separate studies have now confirmed that the

relationship to alcohol use from both childhood sexual abuse (Epstein et al., 1998) and physical abuse (Zlotnick et al., 2006) is mediated by PTSD. Our sample size also limited our ability to examine all four PTS symptoms and covariates simultaneously within the same path model. Given the strong relationship among these four variables, such an analysis is recommended in future, particularly since the hyperarousal model had a borderline RMSEA value (model fit index) of .09.

Another limitation is that we measured depressive symptoms with the CES-D, which some argue is better conceived of as a measure of general distress, given research showing the CES-D measures anxiety in addition to depressive symptoms (Fechner-Bates, Coyne, & Schwenk, 1994). Thus, future inquiries into this topic might use a purer measure of depressive symptoms. Also of note, White and Widom (2008) recently demonstrated that stressful life events, and not PTSD symptoms, fully mediate the relationship between early abuse/neglect and subsequent alcohol problems. Thus, future studies should examine the interplay between factors that contribute to stressful life events (e.g., chaotic interpersonal relationships at home) and PTS symptoms. We were also not able to control for parental alcohol use, a variable that is strongly related to problematic drinking in adolescents (Shin, Edwards, & Heeren, 2009). However, the literature on adolescent misuse of alcohol also suggests childhood maltreatment is related to adolescent problem drinking even after controlling for parental alcoholism (Harter, 2000; Shin, 2009).

Finally, our study did not directly measure motivations to consume alcohol, and measuring explicit motivation is important since drinking to cope (Cooper, 1994) is strongly related to PTSD and alcohol misuse (Dixon, Leen-Feldner, Ham, Faldner,

Lewis, & 2009; Kaysen et al., 2007). Measuring a construct like drinking motives can provide more direct evidence of intentional self-medication, particularly since self-medication is a dynamic process and researchers are only beginning to analyze the fluctuating interplay between both sets of symptoms across time (Ouimette, Read, Wade, & Tirone, 2010). Ultimately then, future studies would be strengthened by using a prospective design with a direct measure of drinking motives, and with a sample large enough to evaluate all symptoms simultaneously, and to explore the model for both genders and specific types of abuse, while controlling for parental alcohol consumption and the potential mediating role of stressful life events.

The results nonetheless have important clinical implications. For individuals with both PTS hyperarousal symptoms and alcohol use problems, clinicians should give consideration to whether or not a trauma-specific therapy that reduces hyperarousal symptoms should be used as an adjunct to treatment for the alcohol misuse. A treatment like imaginal exposure therapy might be useful since it has been demonstrated to decrease all three *DSM-IV* symptom domains (Robertson et al., 2004). In keeping with best practice guidelines, individuals who meet the diagnostic criteria for both PTSD and an alcohol use disorder should receive an integrated treatment approach (Health Canada, 2002) that targets the functional relationship between both disorders (Zahradnik & Stewart, 2008). An integrated treatment approach to treating PTSD-alcohol use comorbidity is important given that unremitted PTSD is implicated in deleterious substance use disorder outcomes (Read, Brown, & Kahler, 2004). As such, treatments that only focus on the alcohol/substance use disorder and not the PTSD symptoms will likely be less effective in the long term. Therefore, individuals with both disorders will

likely benefit from services in which mental health and addiction services are working together.

Overall, this study offers support for a more specific version of the trauma-PTS/PTSD-alcohol self-medication model by highlighting the importance of hyperarousal symptoms. This finding occurred while controlling for age, gender, and depressive symptoms. Our results suggest that for these Mi'kmaq adolescents, it is hyperarousal symptoms, and hyperarousal symptoms alone, that explain the relationship between EV and alcohol misuse. Thus, future research in this area should consider the role of specific PTSD symptom clusters, and not just the construct of PTSD as a whole.

Table 3.1

Bivariate Correlations Among Variables and Means and Standard Deviations

Variables	1	2	3	4	5	6	7	8	9	*M* (*SD*)
1. EV	--	.41**	.47**	.44**	.45**	.42**	.18	-.11	.41**	14.38 (13.15)
2. PTS Hyperarousal		--	.52**	.44**	.59**	.62**	.16	-.12	.49**	5.27 (3.35)
3. PTS Reexperiencing			--	.63**	.59**	.56**	.10	-.21*	.31**	2.67 (2.49)
4. PTS Avoidance				--	.57**	.47**	.17	-.11	.25**	1.75 (1.79)
5. PTS Numbing					--	.70**	.07	-.11	.33**	2.42 (2.42)
6. Depressive Symptoms						--	.06	-.22*	.45**	19.07 (19.89)
7. Age							--	.13	.26**	16.69 (1.39)
8. Gender Male Female								--	-.03	 N = 91 N = 75
9. Alcohol Misuse									--	9.65 (11.06)

Note. EV = Exposure to Violence; PTS = Posttraumatic Stress; CESD = Centre for Epidemiological Studies Depression scale; RAPI = Rutgers Alcohol Problem Index; *M* = mean, *SD* = standard deviation.
*$p < .01$; **$p < .001$.

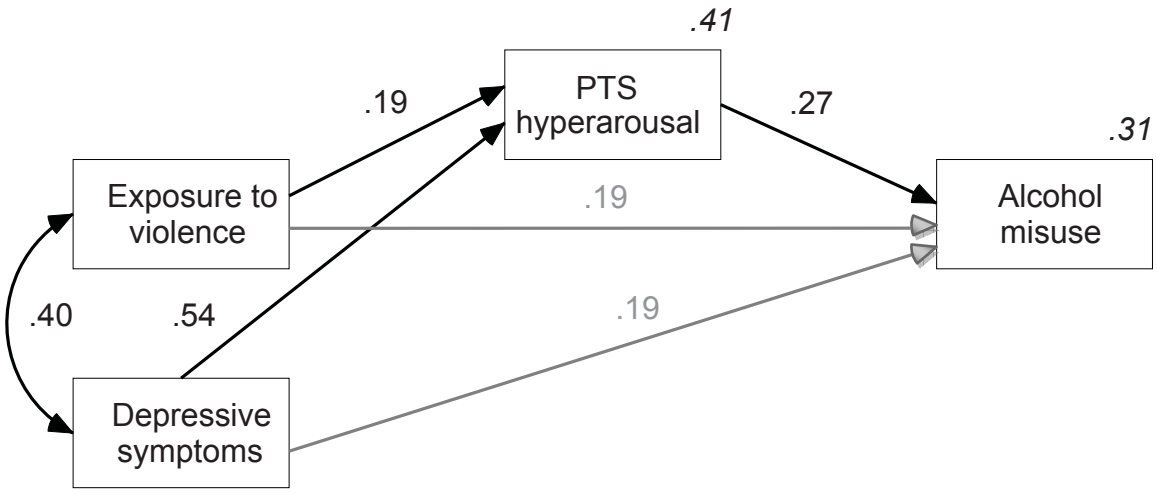

Figure 3.1. The path model involving PTS hyperarousal as a mediator explaining the link between violence exposure and alcohol misuse

Black arrows represent significant paths (i.e., $p < .05$). Grey arrows represent nonsignificant paths (i.e., $p > .05$. Rectangles represent manifest variables. Path coefficients are standardized. Italicized numbers (e.g., *.31*) positioned in the upper right hand of endogenous variables (i.e., alcohol misuse) represent the proportion of variance explained by associated exogenous variables. In the interest of clarity, error terms and demographic variables are not displayed.

Table 3.2

Model Fit Indices for Path Models Testing the Indirect Effects of Exposure to Violence on Alcohol Misuse Through PTS Symptoms

Structural Models	χ^2	χ^2/df	IFI	CFI	RMSEA	90% CI
Hyperarousal	15.25	2.18	.96	.96	.09	.02, .14
Reexperiencing	12.87	2.14	.96	.96	.08	.01, .15
Avoidance	14.85	2.12	.95	.95	.08	.02, .14
Numbing	13.80	1.97	.97	.97	.08	.00, .14

Note. χ^2 = chi square; χ^2/df = chi-square/ degrees of freedom ratio; IFI = incremental fit index; CFI = comparative fit index; RMSEA = root-mean-square error of approximation; CI = confidence interval.

Table 3.3

Bootstrap Analyses for Indirect Effects of PTS Symptoms between Exposure to Violence and Alcohol Misuse Symptoms

Hypothesized indirect effect	Unstandardized indirect effect	Standardized indirect effect	Bootstrap estimates	
			SE for standardized indirect effect	95% confidence interval for standardized indirect effect (lower, upper)
PTS hyperarousal	.042	.051	.028	.010, .126*
PTS reexperiencing	-.004	-.004	.031	-.075, .051
PTS avoidance	-.014	-.017	.027	-.075, .034
PTS numbing	-.007	-.008	.021	-.057, .030

Note. *SE* = bias-corrected standard error.

*Confidence intervals excluding zero are significant (i.e., $p < .05$).

CHAPTER 4. PROLOGUE TO RESILIENCE MODERATES THE RELATIONSHIP BETWEEN EXPOSURE TO VIOLENCE AND POSTTRAUMATIC STRESS REEXPERIENCING IN MI'KMAQ YOUTH

To this point, both the literature reviewed and the presented empirical findings of Study 1 focused on the negative outcomes of EV (e.g., PTS). Yet, despite all of the negative consequences of EV, some exposed youth manage to maintain healthy functioning. This capacity to maintain healthy or positive adaptation within the context of significant adversity or threat is called resilience (Garmezy, 1993; Luthar, Cicchetti, & Becker, 2000; Masten & Obradovic, 2006). Resilience is said to occur when: 1) a circumstance (or set of circumstances) exists that is likely to disrupt a child's development, and 2) the child shows reasonably successful adaptation in spite of the circumstance(s) (Masten, 2001).

As reviewed by Vanderbielt-Adriance and Shaw (2008), when the construct of resilience was first introduced in the 1970s, theorists attributed successful adaptation in the face of adversity to stable personal characteristics. This lead researchers to initially search for protective factors (e.g., IQ) that would make a child "invulnerable" to adversity. But over time the conceptualization of resilience has shifted from a relatively inward and static state to an outward and dynamic process (Vanderbilt-Adriance & Shaw, 2008). Specifically, it is now seen as a dynamic process that consists of a series of ongoing, reciprocal transactions between the child and the environment (Luthar & Zelazo, 2003; Masten, 2001), as opposed to being located solely within the child. Given this definition, resilience may vary across time (e.g., being present in childhood but not

adolescence) and domains (e.g., positive adaptation in school achievement but not with respect to mental health) (Luthar et al., 1993; Vanderbilt-Adriance & Shaw, 2008).

When researchers set out to observe or measure resilience, consideration must be given to whether they will attempt to capture positive adaptation in a context of multiple stressors (e.g., poverty, dysfunctional or absent parenting, neighbourhood/school violence), or in response to one discreet stressor (e.g., children adapting to parental divorce). Thus, researchers can employ a cumulative risk model—where maladaptation is understood to result from an accumulation of adversity—or an individual risk model—where the contribution of one risk factor to a negative outcome(s) is observed (Rutter, 1979). Similarly, positive adaptation can be defined in several ways, from the absence of psychopathology (Tiet et al., 1998) to the mastery of appropriate developmental tasks (Masten, 2001). Although it is recognized that many of the youth who participated in this study struggle with an accumulation of stressors, methodologically, the study presented below used an individual risk model to examine the moderating impact of resilience on the relation of EV to PTS symptoms. However, resilience was operationalized and measured directly with the Child and Youth Resilience Measure (CYRM; Ungar et al., 2008), as opposed to being measured indirectly by way of the absence of psychopathology (e.g., Tiet et al., 1998). It was hypothesized that violence exposed youth who report greater amounts of resilience on the CYRM should report lower levels of PTS compared to youth with comparable levels of violence exposure but lower levels of reported resilience. In other words, it was hypothesized that resilience would moderate or buffer the relation of EV to PTS symptoms.

CHAPTER 5. STUDY 2. RESILIENCE MODERATES THE RELATIONSHIP BETWEEN EXPOSURE TO VIOLENCE AND POSTTRAUMATIC STRESS REEXPERIENCING IN MI'KMAQ YOUTH[10]

Abstract

This study was part of a school-based collaborative research project with a Nova Scotian Mi'kmaq community that hoped to shed light on the relationship between exposure to violence and mental health in First Nations youth. This particular study sought to examine how the multifaceted construct of resilience might act as a protective factor, buffering some students from the negative mental health consequences of EV. The present study focuses on whether the construct of resilience, measured by the Child and Youth Resiliency Measure (CYRM; Ungar et al. 2008), has a moderating impact on the relationship between EV (emotional, physical, and sexual), measured by the Childhood Experience of Violence Questionnaire (CEVQ; Walsh, MacMillan, Trocmé, Jamieson, & Boyle, 2008), and PTS symptoms, measured by the Child PTSD Symptom Scale (CPSS, Foa et al. 2001). Results showed that the positive relationship between EV—measured as emotional, physical, and sexual abuse, and witnessing domestic violence—and the reexperiencing symptom cluster of posttraumatic stress was moderated by resilience, such that exposure to violence was only predictive of reexperiencing at lower levels of

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resilience. These findings not only help provide further cross cultural validation for the CYRM as a measure, but provide support for an ecological conceptualization of resilience.

Introduction

The negative consequences of EV—physical abuse, sexual abuse, emotional abuse, and witnessing domestic violence—have been well documented (see Arellano, 1996; Browne & Finkelhor, 1986; Kendall-Tackett, Williams, & Finkelhor, 1993; Lehmann, 2000; and Veltman & Browne, 2001 for reviews). Cross sectional and prospective longitudinal studies have demonstrated that children who are exposed to violence are at risk for a wide variety of negative outcomes throughout childhood into middle-adulthood. Such negative outcomes include school dropout (e.g., Kaplow & Widom, 2007), violence perpetration (e.g., Fang & Corso, 2008), internalizing problems like posttraumatic stress disorder (PTSD; e.g., Kaplow & Widom, 2007), alcohol-related problems (e.g., Thornberry, Ireland, & Smith, 2001), and illicit drug use (e.g., Widom, Marmorstein, & White, 2006). But in spite of all of the negative correlates and outcomes of childhood exposure to violence, 12-22% of those who were abused as children continue to thrive (Jaffee, Caspi, Moffitt, Pollo-Tomas, & Taylor, 2007). In the literature, this ability to thrive in the presence of adversity is referred to as *resilience* (Masten & Powell, 2003).

Early conceptualizations of resilience emphasized individual factors (Kaplan, 1999). Contemporary definitions of resilience are now shifting towards more ecological interpretations which consider both aspects of the individual and aspects of the individual's environment (Lerner & Benson, 2003; Ungar, 2001) since healthy outcomes

in youth depend on a combination of available resources within both the individual and the community (Luthar, Cicchetti, & Becker, 2000). Specifically, communities need to be able to negotiate for the resources required by its members (e.g., education, economic security, cultural traditions, housing), while individuals need to be able to navigate their way to these resources (Ungar, 2008). Thus, some resilience researchers are now explaining resilience as a dual process of navigation and negotiation (e.g., Luthar, 2003; Ungar, 2005) rather than as a fixed set of attributes of individuals alone. This conceptualization is especially important when investigating resilience in culturally diverse settings, particularly among communities under greater stress.

One of the greatest stressors any child can face is EV. Government research in the area of maltreatment suggests that rates of violence exposure can be quite high in some Aboriginal communities (Health Canada, 2003). For example, in the 1991 Aboriginal People's Survey (Statistics Canada, 1993), 48% of respondents identified that family violence was a problem in their community. As expressed by one woman from the Native Women's Association of Canada: "it is an exception rather than the rule to know of an Aboriginal woman who has not experienced some form of family violence throughout her life" (Canadian Council on Social Development and Native Women's Association of Canada, 1991, p. 25). Unfortunately though, published literature that examines the relationship between EV and PTSD in Canada's Aboriginal peoples is scant. However, one American study has demonstrated a link between maltreatment and PTSD. In a sample of 234 USA Native American women who presented for outpatient ambulatory clinic services, approximately 75% reported suffering either child abuse or neglect, and approximately 40% reported exposure to severe child maltreatment.

Additionally, severe maltreatment as a child was a risk factor most strongly associated with PTSD over other psychological disorders (Duran et al., 2004).

It is with an understanding of the larger historical context of Canada's First People (Zahradnik, 2007) that our research group partnered with a Nova Scotian Mi'kmaq community to implement a community-based collaborative project that sought to understand the impact of EV on youth mental health. The reasons for this study were two-fold: first, there was qualitative data previously collected from the community's youth in which EV was linked to negative outcomes (Comeau, Stewart, & Collins, 2004) and, second, according to anecdotal observations by several members of our community advisory group, there had been a recent increase in the number of youth in the community who were disclosing issues of EV. While community service providers had highlighted the importance of understanding more about EV and mental health consequences in their community, they were also interested in a strengths-based approach to the research. In other words, they wanted information about potential protective or buffering factors, since in their experience, several youth, despite having substantiated histories of EV, had demonstrated an ability to thrive.

The goal of this study was to examine how EV, PTS, and resilience were related to each other in this school-based, collaborative research project. Using the above mentioned literature as a guide, we formed three hypotheses. First, we expected to find significant bivariate relationships between EV and PTS symptoms, such that with elevated EV there would be elevated levels of PTS symptoms. Second, we expected to find significant bivariate relationships between resilience and PTS symptoms, such that with elevated levels of resilience there would be lower levels of PTS symptoms. And

finally, we expected to find that the relationships between EV and PTS would be moderated (i.e., buffered) by resilience, such that the positive relationship between EV and PTS would be stronger when resilience is low than when resilience is high.

Method

Procedures

For a more detailed description of the community and the many steps involved in acquiring community consent and participation in the research process, please see Zahradnik et al. (2007). Data was collected from students who attended either of the community's two high schools, and all data was collected by way of self-report questionnaires. Questionnaires were assigned untraceable identification numbers so that personal information could never be tracked back to an individual participant. Both students and parents/guardians were advised about the study two weeks prior to data collection. Parents and guardians were notified of the study by way of a mailed 'passive consent' form where the parent or guardian was asked to make contact only if they did not wish their child/ward to participate. No parent/guardian refused to allow their child/ward to participate.

All students who were at least 14 years of age at the time of the data collection, capable of reading English, and deemed capable by school staff of giving informed consent, were eligible to participate in the study. School staff was on hand to assist in data collection, but were instructed not to look at or ask students about their answers. Furthermore, the community MH&SWS was informed in advance of the data collection period, and the Director made sure to have staff available for student consultation if the need arose. No students required immediate services as a result of participating. Ethical

approval was obtained from both the Mi'kmaw Ethics Watch and the Dalhousie Health Sciences Human Research Ethics Board.

Participants

The sample was drawn from the community's school-attending youth, and data was collected in both the spring and the fall of 2006. Across the two schools, 166 students participated in the study, which is a little more than half of the number of students who were eligible to participate in the study. Of the 166 students, we were only able to use the data of 126 students (72 female, 53 male, 1 gender not indicated) for this part of the study, because 40 students did not complete our measure of resilience. With respect to completers versus non-completers, there were no group differences in age, education level, EV, or PTS symptoms. Of the 126 students, the vast majority of the students (78.0%) were 16 years of age or older, the age at which according to Nova Scotian Law (Children and Family Services Act, 1990), a child can choose whether or not he or she wishes to report a case of maltreatment where he or she alone was the victim. Approximately one third of the students (29.4%) indicated that they were 18 years of age or older. The self-reported education level achieved ranged from grades 8-12 (M = 10).

Measures

Exposure to Violence. Physical, sexual, and emotional abuse / exposure to domestic violence was measured with the Childhood Experience of Violence Questionnaire (CEVQ; Walsh, MacMillan, Trocmé, Jamieson, & Boyle, 2008), an 18-item-self-report measure of childhood EV for use with children/youth 12-18 years that collects information about whether abuse has been experienced and if so, about the

severity, onset, and duration of abuse experienced. This measure shows strong content, construct, and criterion validity as well as good to excellent test-retest reliability (Walsh et al., 2008). Sample items for each type of abuse include, physical abuse: "How many times has an adult kicked, bit, or punched you to hurt you?"; sexual abuse: "Did anyone ever threaten to have sex with you when you did not want them to?"; and emotional abuse / exposure to domestic violence: "How many times has any one of your parents (or step-parents or guardians) said hurtful or mean things to you?" / "How many times have you ever seen or heard any one of your parents (step-parents or guardians) hit each other?" Answers are provided by circling the appropriate response on a 5-point Likert scale, ranging from 0 (*not at all*), 1 (*1 to 2 times*), 2 (*3 to 5 times*), 4 (*6 to 10 times*), to 5 (*10 or more times*). For our analyses, we summed all items for a total EV score (Cronbach's alpha = 0.92) with a possible range of 0 to 72.

Posttraumatic Stress. Posttraumatic stress symptoms were measured with the Child Post-Traumatic Stress Symptom scale (CPSS; Foa, Johnson, Feeney, & Treadwell, 2001). The CPSS is a 17-item self-report measure designed to tap each of the three DSM-IV PTSD symptom dimensions—reexperiencing, avoidance/numbing, and hyperarousal—in children/youth from ages 8-18 years. Sample items for each symptom cluster include, reexperiencing: "having bad dreams or nightmares"; avoidance/numbing: "trying to avoid activities, people, or places that remind you of the traumatic event"; and hyperarousal: "having trouble falling or staying asleep." Answers are recorded on a 4-point Likert type scale, ranging from 0 (*not at all*), 1 (*once a week or less*), 2 (*2 to 4 times a week*), to 3 (*5 or more times a week*).

The CPSS has demonstrated good internal consistency and re-test reliability, as well as high convergent validity (sensitivity and specificity) with other measures of PTSD in children and adolescents (Foa et al., 2001). In our sample, the internal consistency of the total measure (17 items) was high (Cronbach's alpha = 0.82). We also created symptom cluster scores (subscales). Given more recent evidence on the factor structure of PTSD we separated the avoidance and numbing cluster into two distinct symptom clusters (e.g., King, Leskin, King, & Weathers, 1998) for a total of four subscales. However, in this sample, two of the CPSS subscales (numbing and reexperiencing) had unacceptably low Cronbach alphas (below 0.6) because of three problematic items: two items from the numbing subscale (item 8: trauma-related memory problems, and item 12: having a sense of a foreshortened future), and one item from the reexperiencing subscale (item 4: emotional reactivity to triggers). The two numbing items have also been identified as problematic by other PTSD researchers (e.g., King et al., 1998), and some researchers have begun to drop these items from their studies (e.g., Palyo, Clapp, Beck, Grant, & Marques, 2008). Thus, we dropped these two items. We also dropped the reexperiencing item of emotional reactivity to triggers since the low internal consistency for the scale with this item included can be interpreted within the context of other findings that First Nations people are more likely to experience their anxiety somatically (e.g., Barker-Collo, 1999). Thus, our four subscales were: reexperiencing (4 items; e.g., nightmares; Cronbach's alpha = 0.72), hyperarousal (5 items; e.g., exaggerated startle response; Cronbach's alpha = 0.63), avoidance (2 items; e.g., avoiding thinking about the trauma; Cronbach's alpha = 0.71), and emotional

numbing (3 items; e.g., feeling emotionally numb; Cronbach's alpha = 0.73). This is the first recorded use of this measure in an Aboriginal sample.

Resilience. Resilience was measured using the Child and Youth Resilience Measure (CYRM; Ungar et al., 2008; see Appendix F) – a 28 item measure that has been used with children/youth from ages 12-23 years (Ungar et al., in press). Examples of sample items from both individual and contextual domains are as follows: "Do you strive to finish what you start?" (individual), and "Do you feel supported by your friends?" (contextual). A 5 point Likert-type scale is used for scoring, with response options ranging from 1 (*not at all*), 2 (*a little*), 3 (*somewhat*), 4 (*quite a bit*), to 5 (*a lot*). In our sample, the internal consistency for the full measure was excellent (28 items: Cronbach's alpha = 0.90). However, like with the CPSS, we were interested in which specific aspects of resilience might be moderating the relationships between EV and PTSD symptoms.

The CYRM has been piloted in 11 different countries with samples including Canadian First Nation youth; however, as anticipated by the CYRM's developers, cross cultural comparisons demonstrate low factorial invariance (Ungar et al., 2008). Thus, it has been suggested that future administrations of the CYRM will need to identify unique and culturally valid factor structures when the measure is administered in particular cultural groups (Ungar & Liebenberg., 2005).

Data Analysis

Bivariate correlations were used to assess the relationships between all variables in the model, including EV, PTS, and resilience. A series of multiple regression models were conducted to test the final set of hypotheses regarding resilience moderating effects.

First, the global measure of resilience was tested as a moderator of the anticipated relations between EV and PTS. Next, we examined the moderating effect of the global resilience measure on the relations between EV and the four different symptom clusters of PTS. Third, in an effort to elucidate which aspect(s) of resilience might be acting as the main moderating variable(s), we performed an exploratory principal components analysis to identify distinct resilience factors and then tested these as potential moderators.

To minimize potential collinearity problems (Aiken & West, 1991) we centred our predictor variable (total EV score) and the potential moderator (total resilience score; resilience subscale scores) in all models. In each model, the criterion variable (relevant PTS measure) was regressed on EV, the relevant resilience measure, and the interaction between these. Support for moderation is indicated by a significant interaction term. Significant interaction terms were probed further and tested at high (1 *SD* above mean) and low (1 *SD* below mean) levels of resilience. In addition to examining statistical significance of the simple slopes, we also examined effects sizes (Cohen's f^2, 1988) to interpret the findings, where a small effect size = 0.02, medium = 0.15, and large = 0.35 (Cohen, 1988).

Results

Principal Components Analysis of the CYRM

Since we wanted to determine if any one particular aspect of resilience might account for most of the moderation of the EV – PTS relationship, we present our work on investigating the principal components of resilience first. We performed a principal component analysis of the CYRM items with an oblique (i.e., Oblimin) rotation. This

solution resulted in seven potential components with eigenvalues over 1. Since Kaiser's (1960) eigenvalue > 1 criterion can lead to over-extraction (Hubbard & Allen, 1987), we used the more stringent parallel analysis. A three-component solution met the mean eigenvalue criteria for retention (see Longman, Cota, Holden, & Fekken, 1989). Overall, the three components accounted for 44.0% of the variance and made conceptual sense in terms of the intended structure of tapping both individual and contextual resilience factors (see Appendix G). Based on item loadings, the components were labelled: community (e.g., "Do you think you're treated fairly in the community?" 0.71, and "Do you know where to go in your community for help?" 0.67), family (e.g., Do you feel that your parents watch you closely / know a lot about you?" 0.83 and 0.67, respectively) and individual (e.g., "Do you know how to behave in different situations?" 0.75, and "Do you strive to finish what you start?" 0.67). Items with a loading of .32 or more (Tabachnick & Fidell, 2001) from the pattern matrix were used to calculate component scores. Only two items, "Do you participate in organized religious activities?" and "Do you have enough to eat most days?" failed to load on any one of the three components. These items were retained for the purpose of calculating the total score on the measure, but were not used in the calculation of any of the components. There were four cross-loading items (i.e., items with a component loading of .32 or more on at least two components). These were scored on the component with the most conceptual overlap when calculating subscale scores, ensuring that no single item contributed to two different component scores. Cross-loading items were retained in scoring to keep subscale alpha levels above .70. Component scores were calculated by summing items for community resilience (11

items: Cronbach's alpha = 0.86), family resilience (6 items: Cronbach's alpha = 0.72), and individual resilience (9 items: Cronbach's alpha = 0.79).

Bivariate Relationships and Descriptive Statistics

Bivariate correlations, means, and standard deviations for all variables are reported in Table 5.1. All variables, measured globally, were significantly correlated. Resilience, measured globally (i.e., total on CYRM) was negatively but moderately correlated with EV (CEVQ), PTS (CPSS), and PTS symptoms (save reexperiencing). The CYRM's three subscales showed variation in terms of what variables they correlated with, but as expected, all relationships were negative in direction (i.e., resilience factors associated with lesser PTS).

Moderating Analyses with Global Constructs

When examining the overall model, there were first order effects of EV (CEVQ total score, $B = .27$, $t = 4.51$, $p < .001$) and resilience ($B = -.13$, $t = -3.08$, $p < .01$) on PTS symptoms (CPSS total score). However, contrary to hypothesis, resilience was not supported as a statistically significant moderator for the relation between EV and PTS ($B = -.00$, $t = -.71$, $p = 0.48$) (see Appendix I, table I.1).

Moderating Analyses with Subscales

Another set of analyses was performed to determine if the construct of resilience might moderate the relationship between EV and any of the symptoms of PTS, and if so, which aspect(s) of resilience might make the most relevant contribution. The global measure of resilience was not supported as a statistically significant moderator of the relationships between EV and PTS avoidance ($B = .00$, $t = -.51$, $p = .61$), numbing ($B =$

.00, t = -.93, p = .36), or hyperarousal (B = .00, t = -.25, p = .80) symptoms (see Appendix I, tables I.2, I.3, and I.4 respectively). However, resilience was found to moderate the relationship between EV and PTS reexperiencing symptoms. The interaction term (resilience x EV) was significant (t = -2.80, $p < 0.01$, see Table 5.2, Model 1) (please see Table 2.2 for all *beta* values), and explained an additional 5% of the variance. Examination of the simple slopes revealed that EV was positively associated with elevated PTSD reexperiencing symptoms, but only at low levels of global resilience. A medium effect size (f^2 = 0.28; Cohen, 1988) was supported for the influence of EV on PTS reexperiencing symptoms at low levels of global resilience, while no effect (f^2 = 0.00; Cohen, 1988) was found at high levels of global resilience. The interaction is presented graphically in Figure 5.1.

Three similar analyses were performed in order to examine which aspect(s) of resilience—community, family, and individual—acted as the strongest buffer(s) of the impact of EV on PTS re-experiencing symptoms. In each of the three separate analyses, each interaction term was significant and contributed additional variance to the model (see Table 2.2, Models 2, 3, & 4): community resilience x EV (t = -2.15, $p < 0.05$) explained an additional 3% of the variance; family resilience x EV (t = -2.40, $p < 0.05$) explained an additional 4% of the variance; and individual resilience x EV (t = -2.34, $p <$ 0.05) explained an additional 4% of the variance. Examination of the simple slopes revealed that EV was positively associated with elevated PTS reexperiencing symptoms, but only at low levels of community, family, or individual resilience. Medium effect sizes (f^2 = 0.25 – 0.27; Cohen, 1988) were supported for the influence of EV on PTS reexperiencing symptoms at low levels of the three aspects of resilience, while small

effect sizes (f^2 = 0.00 – 0.05; Cohen, 1988) were found at high levels of the three aspects of resilience.

All 4 models were separately rerun, but this time the 9 individuals who scored a zero on the CEVQ were removed from each analysis. All models stayed significant and results changed negligibly: for the overall models, *F* values decreased by no more than 1.2 and the total variance accounted for changed only by a range of -.007 to .006. Most importantly, all interaction terms remained significant with *t* values changing by -.20 to .17. Given the negligible change in the results, these models are not presented.

Discussion

The goals of this study were twofold: 1) to test the hypotheses that EV among a sample of Mi'kmaq students would positively correlate with PTS symptoms, but that resilience would negatively correlate with PTS; and 2) to investigate whether resilience moderates the relationships between EV and PTS. With respect to our first goal, all bivariate correlations between global measures of each construct were significant and in the expected directions. Our finding that EV was positively correlated with PTS is consistent with the extensive literature that documents a relationship between these variables in the majority culture (e.g., Kaplow & Widom, 2007). Furthermore, our prediction that resilience would be negatively correlated with PTS symptoms was supported, suggesting that resilience protects from the development of more severe PTS.

Our second hypothesis was not confirmed at the global level of analysis. That is to say that the relationship between EV and PTS (measured globally) was not moderated by resilience. Since PTSD is increasingly regarded as a multi-dimensional, 4-factor construct (e.g., King et al., 1998; Stewart, Conrod, Pihl, & Dongier, 1999), we explored

this hypothesis further with the four PTS symptom clusters as separate outcome variables. Resilience did moderate the relationship between EV and the severity of PTS reexperiencing symptoms, such that youth with low resilience scores showed an increase in PTS reexperiencing symptoms as a function of greater amounts of EV. However, youth with high resilience scores—at the global, community, and family level—showed no increase in PTS reexperiencing symptoms as a function of higher levels of EV. While those youth with high levels of individual resilience did show an increase in PTS reexperiencing symptoms as a function of greater amounts of EV, it was still considerably less of an increase than those youth with low levels of resilience. In other words, all three aspects of resilience, but community and family (i.e., contextual) in particular, appear to play important roles in buffering the relationship between EV and PTS reexperiencing symptoms.

This pattern of results is encouraging for several reasons. For one, it means that some First Nations youth who are exposed to higher levels of violence are less burdened by the distressing memories, nightmares, flashbacks, and physiological reactivity to traumatic triggers that characterize the PTSD reexperiencing symptom cluster (APA, 2000)[11]. It is also encouraging because recent evidence (Michael, Ehlers, Halligan, & Clark, 2005) suggests that certain aspects of traumatic memories—their tendency to be experienced in the "here and now" and their lack of accompanying contextual information—increase distress, which in turn, is strongly predictive of greater PTSD severity (Michael et al., 2005).

[11] As previously mentioned, emotional reactivity to trauma related triggers was dropped from our measurement of this symptom cluster.

Furthermore, reexperiencing symptomatology is also associated with non-adaptive coping strategies. For one, it has been shown that reexperiencing symptoms independently mediate the relationship between sexual abuse and self injury among adolescents (Weierich & Nock, 2008). Although our study did not measure self harm or related constructs like suicidal ideation, these issues are considered amongst the most pressing mental health concerns in First Nation communities. For example, suicide rates of First Nation's youth are amongst the highest of any cultural group in the world (Kirmayer, 1994), and are rising (Health Canada, 2003). Second, there is there is evidence that PTSD reexperiencing symptoms and the subsequent negative affect they cause are strongly related to addictive behaviour like problem drinking (Read, Brown, & Kahler, 2004). For example, evidence from a laboratory-based paradigm has shown that for individuals with both a diagnosis of PTSD and an alcohol use disorder, inducing reexperiencing through exposure to trauma cues increases alcohol cravings (Coffey, Stasiewicz, Huges, & Brimo, 2006). Taken together then, our results could be interpreted to suggest the possibility that youth who report higher amounts of resilience and less reexperiencing symptoms as a function of EV would therefore be at less risk of developing chronic PTSD and maladaptive coping such as self-harm and substance use problems. Although these interpretations are speculative, what can be said with more certainty is that youth who exhibit resilience within the context of at least one domain—community, family, or individual—are better protected from at least one of the important mental health consequences of EV compared to those youth without such resilience.

The results of this study should be interpreted within the context of the study's limitations. First, data were collected retrospectively, and retrospective reporting of

abuse may result in underreporting (Hardt & Rutter, 2004) particularly when a longer period of time has elapsed between the abuse and the retrospective report. This may have been an issue in our sample since almost a third of this study's sample (29%) indicated that they were 18 or over and we were asking them to report on incidents that occurred prior to age 18. Furthermore, since this was a school-based study, only youth who were enrolled in school, and attending class on the day of data collection, were eligible to participate in the study. It is therefore possible that our sample of youth is not well represented by those youth who are really struggling with issues of EV and its negative effects since EV has been linked to early school drop-out (Kaplow & Widom, 2007). Another limitation is that our study did not use officially documented cases of EV, but self-report questionnaires. Although substantiated cases of EV confirm the veracity of the incident, it has been suggested that self-report questionnaires provide the most accurate estimates of EV. Not only do they capture events that go unreported to official sources, but self-reports also increase the rates of disclosure of sensitive topics (Hamby & Finkelhor, 2000). Furthermore, the cross-sectional design of this study did not allow us to capture information on the temporal sequencing of events, so it is possible that some youth developed PTS symptoms from other traumas that preceded their EV (e.g., motor vehicle accidents). Also, given that multiple statistical tests were conducted, there is the possibility that some of our significant findings were perhaps due to chance. And finally, the research team recognizes that with respect to substantiated cases of maltreatment, Aboriginal families compared to non-Aboriginal families present with more cases of neglect, but less cases of both physical and sexual abuse (Blackstock, Trocmé, & Bennett, 2004). Thus, given that neglect is a very pressing social issue for Aboriginal

communities, future research should investigate its relation to mental health outcomes and the buffering effect of resilience.

The finding that no single resilience factor seemed more protective than another within the context of PTS reexperiencing symptoms suggest that there are multiple avenues through which service providers in Aboriginal communities can foster resilience in their community's youth. Youth who have a sense of themselves as co-operative, responsible, and perseverant are also more likely to be resistant to reexperiencing symptoms following EV. Although not captured in our measure of resilience, there is good evidence to suggest that school-based programs are an ideal location to initiate programming that fosters these and similar characteristics (e.g., Gottfredsen, 1986; Henderson & Millstein, 1992; Werner & Smith, 1992). Furthermore, given how we have measured resilience, our findings support Agaibi and Wilson's (2005) position that posttraumatic resilience can be learned, and not just by the youths themselves, but by the community as a whole. From our sample, youth who have relationships with their family that are characterized by trust and openness are less likely to experience reexperiencing symptoms as a result of EV. Thus further family-based programming that emphasizes effective communication for parents struggling with multiple stressors might be an effective initiative to reduce emotional distance between youth and their parents. Furthermore, as our results show, youth who demonstrate more community resilience (e.g., involvement with community and cultural traditions, experiencing the community as fair) are more likely to be protected from PTS reexperiencing symptoms if they have been exposed to violence. Thus, more broadly-based and sustainable community programs that offer opportunities for youth to become more closely involved with various

aspects of community life are recommended. Ultimately, maltreated youth stand a better a chance of being protected from the development of PTS when in the presence of social support/resources (Brewin, Andrews, & Valentine, 2000).

In conclusion, this study had two key findings. First, it provided further validation of the CYRM as a measurement of resilience since this measure was protective against (found to negatively correlate with) PTS, a construct that was found to positively correlate with EV. Second, resilience, whether community, family, or individual-based, was found to moderate or buffer the relationship between EV and the PTS symptom of reexperiencing, such that EV was more strongly predictive of reexperiencing at lower levels of resilience. The latter finding further supports an ecological conceptualization of resilience, since it was not only individual-based resiliency that proved to exert a buffering effect.

Table 5.1.

Correlations Among Variables

Variables	2	3	4	5	6	7	8	9	10	*M*	*SD*
1. CEVQ Total	.47**	.44**	.42**	.46**	.40**	-.23*	-.22*	-.07	-.32**	14.54	13.70
2. CPSS Total		.77**	.81**	.70**	.79**	-.34**	-.35**	-.29**	-.21*	12.44	8.89
3. CPSS Reexperiencing			.61**	.58**	.50**	-.17	-.20*	-.11	-.12	2.78	2.69
4. CPSS Avoidance				.58**	.43**	-.23**	-.27**	-.07	-.15	1.79	1.93
5. CPSS Numbing					.59**	-.20*	-.31**	-.24**	-.23**	2.50	2.64
6. CPSS Hyper arousal						-.32**	-.21*	-.22*	-.15	5.38	3.66
7. CYRM Total							.92**	.84**	.77**	103.35	17.78
8. CYRM Community								.62**	.58**	45.15	8.78
9. CYRM Individual									.49**	37.15	7.15
10. CYRM Family										21.04	5.01

Notes: CEVQ = Childhood Experience of Violence Questionnaire; CPSS = Child Post-traumatic Stress Symptom scale; CYRM = Child and Youth Resiliency Measure; *M* = mean; *SD* = standard deviation
* $p < .05$ ** $p < .01$.

Table 5.2.
Moderating Effects of Various Aspects of Resilience on the Relationship between Exposure to Violence and the Posttraumatic Stress Symptom of Reexperiencing

Moderation Model	Posttraumatic Stress Reexperiencing					
	F	R^2	*B*	β	*t*	f^2
Model 1. Global Resilience	13.16	.24				
EV			.06	.32	3.64***	
Global Resilience			-.01	-.08	-0.99	
EV X Global Resilience			-.00	-.24	-2.80**	
Simple Slopes for EV at:						
Low Global Resilience (- 1 SD)			.10	.51	5.85***	.28
High Global Resilience (+ 1 SD)			.03	.13	1.00	.00
Model 2. Community Resilience	12.16	.23				
EV			.07	.34	3.98***	
Community Resilience			-.03	-.10	-1.24	
EV X Community Resilience			-.00	-.19	-2.15*	
Simple Slopes for EV at:						
Low Community Resilience (- 1 SD)			.10	.49	5.50***	.25
High Community Resilience (+ 1 SD)			.04	.21	1.63	.02
Model 3. Family Resilience	11.93	.23				
EV			.07	.34	3.54***	
Family Resilience			.02	.03	0.33	
EV X Family Resilience			-.01	-.22	-2.40*	
Simple Slopes for EV at:						
Low Family Resilience (- 1 SD)			.10	.50	5.73***	.27
High Family Resilience (+ 1 SD)			.03	.16	1.13	.00
Model 4. Individual Resilience	12.11	.23				
EV			.08	.42	5.29***	
Individual Resilience			-.03	-.06	-0.79	
EV X Individual Resilience			-.01	-.19	-2.34*	
Simple Slopes for EV at:						
Low Individual Resilience (- 1 SD)			.12	.59	5.70***	.26
High Individual Resilience (+ 1 SD)			.05	.26	2.37*	.05

Notes: EV = exposure to violence; X = multiplication; SD = standard deviation; *F* = *F* ratio for total model being different from zero; R^2 = variance accounted for by total model; *B* = unstandardized beta coefficient; β = standardized coefficient; *t* = *t* test for coefficients; f^2 = effect size. *F* values for all 4 models are significant at $p < .001$.
* $p < .05$ **, $p < .01$, *** $p < .001$

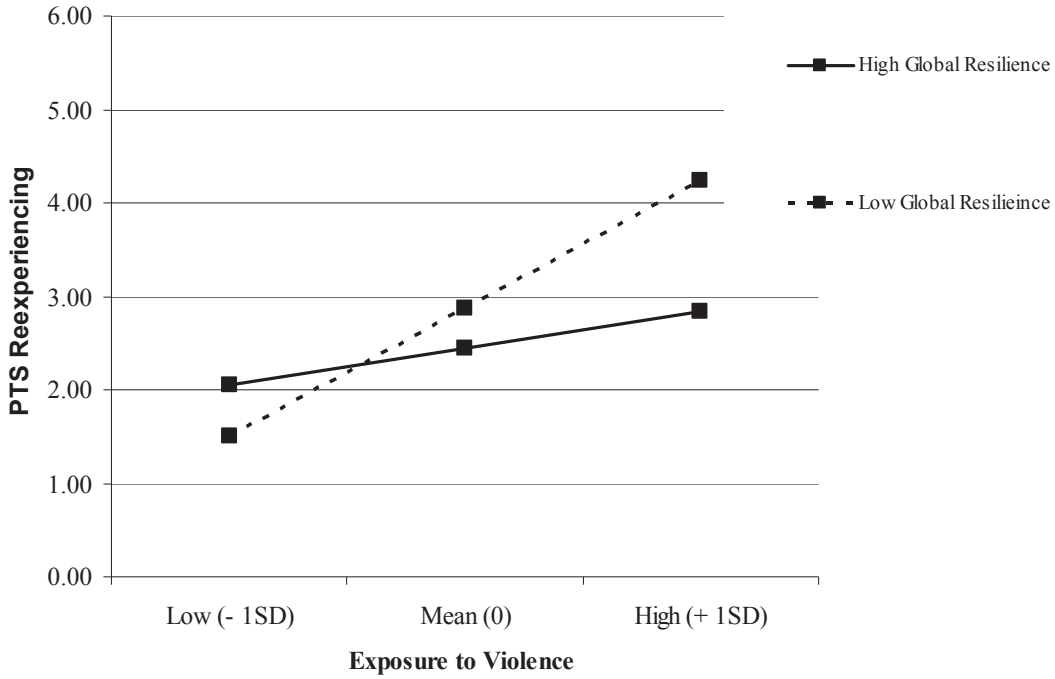

Figure 5.1. Slopes for the differential effect of exposure to violence on PTS reexperiencing at low and high levels of resilience

CHAPTER 6. PROLOGUE TO KNOWLEDGE TRANSLATION IN A COMMUNITY-BASED STUDY OF THE RELATIONS AMONG VIOLENCE EXPOSURE, POSTTRAUMATIC STRESS, AND ALCOHOL MISUSE IN MI'KMAQ YOUTH

The first two studies of this body of work were empirical investigations that examined the relationship between EV, PTS symptoms, depression, resilience, and alcohol misuse. The first study demonstrated empirical support for the self-medication hypothesis by showing that PTS hyperarousal symptoms partially mediated the relationship between EV and alcohol misuse. The second study demonstrated that violence-exposed youth who reported higher levels of resilience had fewer PTS reexperiencing symptoms as a function of EV than youth with lower levels of resilience but comparable levels of EV. The final study lays out the steps involved in forming a collaborative research relationship with the community from the outset. Importantly, it also describes how the results of the research were communicated back to the community in order to help various levels of the community understand and respond to the results.

CHAPTER 7. STUDY 3. KNOWLEDGE TRANSLATION IN A COMMUNITY-BASED STUDY OF THE RELATIONS AMONG VIOLENCE EXPOSURE, POSTTRAUMATIC STRESS, AND ALCOHOL MISUSE IN MI'KMAQ YOUTH[12]

Abstract

In 2004, our research group was invited to continue a research partnership with a Nova Scotian Mi'kmaq community that was concerned about the causes of and interventions for adolescent alcohol misuse in their community. While our previous collaborative research focused on reducing adolescent alcohol misuse by targeting motivations for drinking that were personality specific (see Mushquash, Comeau, & Stewart, 2007), the more recent collaboration sought to investigate the possible relationship between exposure to violence, post-traumatic stress, and alcohol misuse. The present study outlines the steps involved in gaining community consent, the plan for results sharing, the tangible benefits to the community that have been documented, and future directions and lessons learned. The study will demonstrate how the principles of Knowledge Translation (CIHR, 2006) provide a framework for this process.

[12] Adapted from *First Peoples Child and Family Review,* 4, Zahradnik, Stewart, Stevens, and Wekerle, "Knowledge Translation in a Community-Based Study of the Relations Among Violence Exposure, Post-Traumatic Stress and Alcohol Misuse in Mi'kmaq Youth," 106-117, (2009). Permission was not necessary to obtain from this journal since they do not own the copyright (see Appendix H). As first author of this manuscript I contacted the community to initiate collaboration; I contributed to the design of the study; I arranged for all of the workshops and collected all of the data; I managed the data-base and conducted the data analyses; and I wrote the manuscript and then made revisions based on feedback from my coauthors, the peer-reviewers, and the editor of the journal.

Introduction

Indigenous peoples world-wide have been confronted with a global economy that would appear to care little for their autonomy or sense of cultural identity (Kirmayer, Bass, & Tait, 2000). In many cases, such rapid change creates a sense of cultural discontinuity, which has been linked in many communities to high rates of problems with depression, alcoholism, suicide, and violence (Kirmayer et al., 2000). The most profound impacts have been observed among indigenous youth (Kirmayer et al., 2000). Unfortunately, such problems exist in many Canadian Aboriginal communities today. Many of the problems that Canadian Aboriginal communities must struggle with have at their origin a colonial past of conquest and subsequent pattern of paternalistic and aggressive attempts at assimilation, culminating in such policies as those that lead to the residential school system (see Armitage, 1995; Indian and Northern Affairs, 1996; Knockwood, 1992; Miller, 1996). Sadly, 20-30 percent of Canada's Aboriginal Peoples (approximately 100,000) attended residential schools (Thomas & Bellefeuille, 2006), and many of those exposed to the residential school system were abused and/or neglected. The residential school system left many of its "students" alienated from two cultures, without healthy role models for parenting (Quinn, 2007). Subsequently, many lacked the necessary knowledge and skills to provide healthy parenting to their own children (Bennett & Blackstock, 2002; Grant, 1996). And so the legacy of colonization, largely by way of the residential school system, left in its wake a process of intergenerational or multigenerational trauma (Gagne, 1998; Wesley-Esquimaux & Smolewski, 2004), in which many of the problems faced by aboriginal communities today are cyclically perpetuated. In Canada, Aboriginal children and youth are over twice as likely to be

investigated and reported for neglect as well as to be placed in foster care when compared to non-Aboriginal groups (First Nations Child & Family Caring Society of Canada, 2005).

It is with this understanding of the larger historical context of Canada's First People that we began a community-based collaborative project with a Nova Scotian Mi'kmaq community that sought to understand how such things as violence, depression, anxiety, and addictions fit together in the lives of their youth today. While we recognize the historical and cultural roots to maltreatment and substance misuse problems in some Aboriginal communities, our study was not designed to test the contribution of these historical factors (Zahradnik, Stevens, Stewart, Comeau, Wekerle, & Mushquash, 2007). Rather, we sought to examine whether or not there was a pathway from EV through the mental health consequences of such a trauma (e.g., post-traumatic stress or depressive symptoms) through to alcohol misuse, in a sample of school-attending adolescents.

The results of our research made a strong case for how certain aspects of post-traumatic stress disorder (PTSD) helped make sense of the EV – alcohol misuse relationship. PTSD is an anxiety disorder that can sometimes follow from exposure to a traumatic event, like exposure to interpersonal violence (APA, 1994). PTSD manifests itself by way of three symptom clusters: re-experiencing symptoms, hyperarousal, and avoidance and numbing[13]. Our study demonstrated that the symptom cluster of

[13] The DSM-IV-TR (APA, 2000) defines PTSD as an illness that is precipitated by exposure to a traumatic event (experiencing or witnessing the threat of death or the physical integrity of a person) in which the individual responds to the traumatic event with a sense of fear, helplessness, or horror, and within a month of the event develops symptoms from the following three symptom clusters: 1) re-experiencing (e.g., nightmares), 2) hyper-arousal (e.g., hypervigilance), and 3) avoidance (e.g., avoiding

hyperarousal served as a mediating factor (i.e., acted as an explanatory bridge) in the relationship between EV and subsequent alcohol problems (Zahradnik, Stewart, Stevens, Wekerle, & Mushquash, 2007). These findings are consistent with the self-medication hypothesis (Chilcoat & Breslau, 1998; De Bellis, 2002; Stewart, 1996), in which individuals use alcohol and/or other drugs to alleviate the PTSD hyperarousal symptoms that resulted from an earlier exposure to a trauma. Both the results of the study and our recommendations have been communicated back to the community.

The purpose of the present study is to demonstrate to the reader how our collaborative community research study (see also Zahradnik et al., 2007a) is congruent with what the Canadian Institutes of Health Research call *integrated knowledge translation* (KT) (CIHR, 2008a). Integrated KT is an approach to conducting research by which both researchers and research-users work together to shape the research process (CIHR, 2008a). The steps involved in our KT dissemination plan can be divided as follows: 1) community consent; 2) sharing of results; 3) tangible benefits and documented responses; and 4) future directions and lessons learned. The heading names designated for each step should be conceived of as part of an organizational heuristic for the purpose of this study. This is because each *step* (e.g., community consent) often contains within it multiple steps that taken together are consistent with CIHR's *six opportunities for KT within the research cycle*[14] (CIHR, 2008b). We describe each of our steps in turn, below.

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people or places associated with the trauma) and emotional numbing (e.g., sense of a foreshortened future).

[14] These six opportunities are as follows: 1) defining research questions and methodologies; 2) conducting research (as in the case of participatory research); 3) publish research findings in plain language and accessible formats; 4) placing research

Community Consent

As the community we have been working with is a self-governing one, the issue as to what type of knowledge should be researched, let alone translated, had to be decided upon by various levels of the community. Ultimately, the band-appointed directors of both the board of education and the board of health had to bestow their approval upon the final iteration of the project, but this final version evolved gradually as a function of community input. To follow is a brief account of how our initial contact with the community led to the identification of two topics about which the community wished to become more knowledgeable. Specifically, these two topics were (1) childhood EV—in the form of physical, sexual, emotional abuse, and witnessing domestic violence—and (2) post-traumatic stress reactions (for a full description, see Zahradnik et al., 2007a).

Our research team was first invited to work with this community back in 2002, when the community wanted to discuss ways of improving the success of their efforts to tackle teen alcohol misuse in their community. That invitation eventually resulted in the participation of both the community youth and the school staff in the development of a culturally relevant early intervention program for alcohol misuse, entitled "Nemi'simk, Seeing Oneself" (see Comeau et al., 2005), which was shown in an uncontrolled pilot study to be effective in reducing rates of drinking, binge drinking, and levels of alcohol problems in high personality risk youth (see Mushquash et al., 2007). From the early qualitative phase of the "Nemi'simk" project, some of the youth identified EV as being connected to their motivations for drinking. As it turned out, EV was becoming a topic

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findings into the context of other knowledge and socio-political norms; 5) making decisions and taking action informed by research findings; and 6) influencing subsequent rounds of research, based on the impacts of knowledge use.

of concern to some of the community service providers as well, based on their experiences in working with youth in this community.

In the fall of 2005, a school guidance counselor involved with the "Nemi'simk" project spoke to our group in the interest of collaboration and linked the themes of violence expressed by some of the youths to her own observation of the growing number of disclosures of child abuse in her community. This led our group to reflect on what has been written about the relationship between childhood maltreatment and alcohol misuse. In short, interpersonal violence increases the risk for the development of PTSD (Brewin, Andrews, & Valentine, 2000; Wekerle & Wall, 2002). Not only is the development of PTSD linked to subsequent alcohol misuse (Kilpatrick et al., 2003; Stewart, 1996; Wekerle & Wall, 2002), but sexual assault, physical assault, and witnessing violence are all variables that increase the risk of developing comorbid (i.e., concurrent) PTSD and alcohol abuse/dependence. Furthermore, some researchers have argued that the relationship between these three variables (EV, PTSD, and alcohol misuse) is best explained by the self-medication hypothesis (Chilcoat & Breslau, 1998; DeBellis, 2002; Stewart, 1996), in which individuals use substances to temporarily find relief from their anxiety symptoms (e.g., hyperarousal). Continued self-medication may then lead to what some researchers have described as a mutual maintenance model (Jacobsen et al., 2001; Stewart & Conrod, 2008) in which the physiological arousal associated with substance (e.g., alcohol) withdrawal symptoms exacerbates hyperarousal symptoms leading to the long-term maintenance of the comorbid PTSD and alcohol use disorders.

Given these well-documented, empirical links between variables, and the perceived community relevance, we therefore thought that a study that examined how

PTS symptoms might bridge (i.e., mediate) the relationship between childhood EV[15] and subsequent problems with alcohol would be well received by the community. We immediately shared this idea with the guidance counselor, which lead to a decision to bring this idea before the director of education and other community stakeholders. The guidance counselor was invited to join the research team, and she assumed the dual roles of both a co-investigator and community champion. As credible advocate, she was best positioned to provide the first presentation to the wider community for input and opinion-seeking regarding the consent process to be utilized at the community, high school and individual level.

While a more detailed definition and explanation of what was involved in gaining community consent is articulated in a previous study by this group (see Zahradnik et al., 2007a), for the purpose of the present study it is important to summarize how community input molded the nature of the final project. The KT component of this project began during the principle investigator's (PI's) first formal meeting with the community-based collaborative and therapeutic team (Case Management) and the Inter-Agency (from here on in referred to as an advisory group), which jointly consist of representatives from the following service providers/institutions: MH&SWS, Native Alcohol and Drug Abuse Counselling Association (NADACA), the Health Centre, Home Care, Mi'kmaq Family and Children's Services, the Regional Hospital's Child and Adolescent Services, the RCMP, as well as three schools under the jurisdiction of the School Board.

The Canadian Institutes of Health Research has defined *knowledge translation* as follows:

[15] We use this term instead of child maltreatment because we measured physical, sexual, and emotional abuse / witnessing violence, but not neglect.

Knowledge translation is the exchange, synthesis and ethically-sound application of knowledge - within a complex system of interactions among researchers and users - to accelerate the capture of the benefits of research for Canadians through improved health, more effective services and products, and a strengthened health care system (CIHR, 2006).

This definition is particularly important in light of what has been referred to as the "*two communities*" problem (Caplan, 1979). The term was originally intended to describe how researchers and policy makers inhabit different worlds with different language and culture. However, the term is equally applicable in this context, where the PI/university-based researchers and the community service providers came from "different worlds." Having the counsel and active support of a community-based advocate, the distance between these two worlds was bridged, given the advocate's personal and professional ties to the reserve on the one hand, and the knowledge and her credentials of a Master's student of School Psychology on the other.

Issues around maltreatment and addictions were not new to the community advisory group to the research project, and their collective expertise on how these issues have been affecting their community guided the development of the study design (see below). Likewise, many agency representatives, although familiar with the term PTSD in passing, readily appreciated how many of the youth they were seeing were demonstrating behaviors that could be consistent with a presentation of PTS (e.g., avoidance, volatile temper). However, although the term PTSD was initially used during the presentation to the advisory group, it was ultimately concluded that diagnostic labels would not be used. This conclusion came to pass based on a convergence of views between the community and the research team, since both groups had some concerns about the use of diagnostic labels within this research context. Thus, instead of measuring PTSD categorically

(diagnosis is present or not present), the research team was able to choose from several self-report measures for the intended age range that would measure PTSD symptoms on a continuum of severity (very low to very high). This solution left both partners with a sense of confidence in how the study design could maintain a harmonious balance between sensitivity to the community needs and preferences on the one hand and scientific rigor on the other.

The study design continued to evolve through further dialogue with the agency representatives whose community-based knowledge ensured that the study would focus on those issues most salient to the community. Particularly, one key change was to be made to the design of the study before the study was fully embraced by the community. Specifically, at the request of advisory board members, both a measure of depressive symptoms and a measure of resilience were added in place of other questionnaires. The former was added to explore alternative pathways to alcohol misuse, while the latter was insisted upon to better understand when/how youth are able to right a negative developmental trajectory (for a rationale, see Zahradnik et al. 2007a). Furthermore, in subsequent meetings, many individuals were concerned that the questions being asked of the students (about exposure to sexual and physical abuse) might lead to elevated levels of distress, and possibly suicide. This concern was addressed in several ways. First, the PI reassured the concerned individuals that empirical evidence overwhelmingly suggests that answering questions about physical and sexual trauma, or writing about trauma in general, does not tend to lead to elevated levels of distress for most individuals (Carlson et al., 2003), and can actually be therapeutic (Pennebaker, 1997). Second, our community advocate was able to share her professional experience of working with

abused youth on a daily basis as a high school counselor where daily functioning was maintained by youth. Third, since the information was to be collected anonymously by paper-and-pen self report measures, it was jointly decided that the measure of depressive symptoms used should not include a question on suicide, since the team would be incapable of following-up on any students who self-identified as at an elevated risk for suicide (for complete details see Zahradnik et al., 2007a). And finally, the concerned individuals were reminded that MH&SWS would be on call during the time of the data collection. There were, though, no reported incidences of students availing themselves of these services as a result of the study, although one youth discussed their maltreatment individually with the school counselor. That youth decided that he/she did not want to pursue individual counseling options at that time.

Sharing of Results

Ultimately, it was collaboratively decided that the following topics would be investigated by way of self-report measures: exposure to violence (Childhood Experience of Violence Questionnaire, CEVQ; Walsh, MacMillan, Trocmé, Jamieson, & Boyle, 2008), posttraumatic stress symptoms (Child PTSD Symptom Scale, CPSS; Foa, Johnson, & Feeney, 2001), depressive symptoms (Center for Epidemiological Studies Depression Scale, CESD; Radloff, 1977), alcohol-related problems (Rutgers Alcohol Problem Index, RAPI; White & Labouvie, 1989), and resilience (Child and Youth Resilience Measure, CYRM; Ungar, et al., 2008). Given that some members of the community were concerned about how the research might be used, and how their community could benefit from the research, we jointly formulated a community dissemination plan. According to Hanson and Smiley (2006), a community

dissemination (KT) plan should ensure that the research results are returned to the community so as to guarantee that the community can benefit from the research. The community dissemination plan for the results involved four partially overlapping targeted audiences: the advisory group, the director of MH and SWS, the school staff (including administrators, teachers, and guidance counselors), and the students themselves. Each target audience received a presentation that was tailored to their specific needs.

For the advisory group, the full results of the study were presented at an Inter-Agency meeting, a forum for representatives of all community service providers to meet and discuss issues of relevance to the community. The presentation followed the format of an interactive science presentation for non-specialists. This presentation style allowed the PI to present the material in a manner that was consistent with how the study had initially been proposed to the advisory board. It also ensured that all questions from the advisory group were addressed and that the PI could receive feedback, particularly about what the advisory group wanted to do with the information collected through the project. Together, it was determined that community services providers who work with youth (and adults) might benefit from a series of training workshops that addressed issues around the screening/assessment and management of PTS symptoms in their youth, as well as methods for promoting resilience (see next section).

With respect to information collected on EV, it was felt that the descriptive results would be most helpful if they were reported back to the social services director in a format that could be used to supplement this agency's funding applications. In other words, the advisory group felt that a document on rates of the studied variables (e.g., EV)—reported by the school-attending youth—could be used to the community's benefit

in terms of being readily available for use in their applications to funding agencies for increased funding to deal with these types of issues in their communities. To this end, this director, as the second target audience, received a technical report that provided the following information: descriptive information on alcohol, drug, and tobacco use; descriptive information about depression and PTS symptoms; descriptive information about the rates of both physical abuse and sexual abuse, including the perpetrators' gender and relation to the victim (grouped at the aggregate level); as well as an analysis of the effect that various forms of abuse (physical, sexual, or combined abuse) had on rates of substance use and mental health[16].

With respect to the schools where this study took place, the administrators believed that all school staff would benefit from hearing about the results. Therefore, the PI gave separate presentations at each school. These presentations helped place some of the more problematic student behaviors (e.g., sudden angry outburst) into a greater context of distress for the teachers. It also resulted in the teachers unanimously accepting the research team's proposal of making use of class time to discuss the results of the study with the fourth target audience — the students themselves.

How to best address the student audience was determined in consultation with the guidance counselors and senior administrators of each school. Firstly, it was thought that since PTSD was not a well understood or discussed topic in the health curriculum, the students would be best served if the presentations focused less on the scientific results of the study, and more on what PTSD is, how to recognize each symptom cluster (i.e., re-experiencing, hyperarousal, and avoidance/numbing), and how to get help for PTSD

[16] To date this information has been used to compliment three distinct funding applications by the present mental health/social services director of this community.

within their community. Second, while the PI and university based-research team proposed the idea of giving talks to all students at each school (i.e., mandatory attendance), the principal of the larger school decided it would be best to post advertisements for interested students, while the guidance counselor of the smaller school hand-picked the students she believed to be struggling with issues relevant to PTS. Presentations to the students occurred in small groups, typically no more than eight per group, and typically homogeneous with respect to gender. Presentations emphasized using community resources for help (e.g., guidance counselor, anonymous 24-hour national youth help phone etc.), that avoidance behaviors (e.g., coping by way of drugs and alcohol) are more likely to result in continued symptoms, and the benefit of positive coping styles (e.g., regular exercise, talking with friends). The student response to these presentations is documented below.

Tangible Benefits and Documented Results

This section will outline the tangible benefits to the community that have occurred as a result of the study in terms of quantitative results. By the studies end, thirty six students had received presentations. For the first fifteen students, some basic pilot data was collected on how they experienced the presentation; whereas, a pre-post format was used for the remainder of the students (as explained below). Participants were asked to answer four questions on a 1-5 Likert-type scale (1 = not at all, 2 = a little, 3 = somewhat, 4 = quite a bit, 5 = quite a lot). Grouping students on whether or not they responded to each question with a score of 4 or more (quite a bit), 87% of students believed that the presentation improved their understanding of PTSD, while 80% felt that the content was personally meaningful. But while 67% felt like they were more likely to encourage

someone close to them consult a health care provider after hearing the presentation, only 27% indicated they were more likely to see a health care provider themselves as a result of the presentation. Unfortunately, for this group of students, it could not be determined whether their reluctance to visit a health care professional was a result of their own adaptive functioning (or lack of personal relevance of the topic for them if they had not been exposed to violence or experienced PTS reactions themselves), external obstacles, or internal obstacles (e.g., lack of belief that someone can help). The PI attempted to address this question, and several others, in the next wave of presentations.

To get a better understanding of whether or not these presentations were objectively increasing students' knowledge of PTSD and how students were presently coping with their stress, a new set of questions were devised. Fifteen students were asked a total of five multiple choice and true false questions about PTSD (e.g., what are the three symptom clusters) both before and after the presentations. They were also asked two questions about contact with mental health/wellness workers (including guidance counselors, social workers, and other mental health professionals), one pre-presentation question relating to frequency of contact with mental health/wellness workers within the last year (1 = never, 2 = once, 3 = 2-6 times, 4 = once a month, and 5 = at least three times a month), and one post-presentation question about intention to contact mental health/wellness workers as a function of the presentation (1 = not at all, 2 = a little, 3 = somewhat, 4 = quite a bit, 5 = quite a lot).

In a pre to post information session analysis, knowledge scores (out of 5) improved significantly as a function of exposure to the information session (pre = 2.93 vs. post = 3.73; t (14) = 2.703, p = .017; two tailed test). Forty two percent of the youth

indicated that they had no previous contact with mental health/wellness workers, but reasons were not given as to why (e.g., no personal need, or alternatively, encountering barriers to treatment seeking). Inversely, in our small sample of self- or school-selected students, over 50% of students reported having seen a mental health/wellness worker at least once. While 50% of the students that answered the question indicated that they were more likely (score of 4 or 5) to urge a friend or a family member to contact a wellness worker as a result of the presentation, only one student said he/she was more likely to seek help herself. From the qualitative data provided by the students on how they deal with such problems without contacting a mental health/wellness worker, three patterns emerged: 1) active coping by talking to family or friends about the problem, 2) coping by way of pro-social avoidance (e.g., playing sports or activities), and 3) coping by way of problematic avoidance (e.g., taking drugs/alcohol, spending more time alone [social withdrawal]).

While the numbers are small, and while the questions were not designed to screen for a history of trauma or active PTS symptoms, an overall pattern seemed to emerge. First, the students subjectively felt that the information presented to them was relevant. Second, there was an objective demonstration of an increase in knowledge about PTSD by the end of the presentation (albeit these are pilot results as no control group was included). Third, while students reported that as a result of the presentation they were more likely to urge a friend or family member to seek help for trauma-related problems, only one student indicated that she was likely to seek help for her own trauma related problems. Unfortunately, although students were provided with space to write out open ended responses to why they would not seek out help for their own concerns, they were

generally not forthcoming, though a couple of students claimed not to have any problems. Furthermore, the category of mental health/wellness worker queried about included both guidance counselors and community mental health services staff, which suggests that there may be a greater reluctance to discuss these issues with anyone beyond family/friends, and not just an issue of worrying about being seen at a place dedicated to mental health and wellness.

It is difficult to account for the seeming disconnect between the high perceived relevance of the presentations to students, and their lack of consultations with mental health/wellness professionals (or the lack of effect of the presentation on shifting this reluctance to consult). Hopefully, as community service providers become more knowledgeable in screening for and treating PTSD in youth, community professionals will be able to encourage students to explore consultation options if they are struggling with issues related to post-traumatic stress. The community was encouraged to consider the possibility of forming youth focus groups to get a better understanding of the complicated dynamics that affect students' decision making process behind their reluctance to seek help from community service providers.

While it has been important to the community to increase youth awareness around trauma and PTSD, these presentations have coincided with an initiative to increase the service providers' capacity to competently and confidently screen for PTSD symptoms and manage them as well. To this end, the PI co-facilitated a workshop for the community health and addictions professionals, by bringing into the community a professional clinical psychologist. On the morning of the workshop, the PI presented the results of the study. This was done to contextualize the content of the day's proceedings

for those individuals whose involvement/knowledge of the research was more remote. Overall, twenty four service providers (a group primarily comprised of social workers, addiction counselors, and school guidance counselors) with an average of ten years of professional experience, attended the workshop. Given that none of the service providers in attendance had a degree that would allow them to make a diagnosis, the workshop emphasized screening procedures for PTSD. The workshop was divided into two components, one content-based and the other practice-based. The content component covered such questions as "What is PTSD and why does it occur (e.g., risk factors)?", "What are its symptoms?", "What other complications often accompany PTSD (e.g., comorbidity with depression or substance abuse)?", and "What screening tools are available and how are they used?" The practice component consisted of five vignettes that were crafted by the presenter with the assistance of a Mi'kmaq addictions counselor. Attendees broke into small groups, and the members of the small groups worked together to apply the content they had learned to the presenting cases in front of them in order to identify what PTSD symptoms were present, and what other factors might be involved (e.g., social support vs. being isolated).

Based on a survey administered before the workshop began, only 26% (six) of the service-providers present indicated that they regularly screened for PTSD. However, 50% (six) of those who completed a post-workshop question on likelihood to screen, and who previously indicated that they *were not* presently screening for PTSD, indicated that they were more likely to screen for PTSD (minimum score of 4) as a result of the presentation. This means that by the end of the presentation, 67% (12) of the group indicated a willingness to screen for PTSD. This is encouraging given that 100% of those

in attendance at the beginning of the presentation indicated that PTSD was a concern in their community. As with the students, a simple five-item knowledge test was given before and after the presentation and workshop. After removing from the analysis the data of the 5 individuals who had to leave the workshop early (where no post-session data was available), of the 19 participants who remained, even after counting blank answers as incorrect, there was a significant increase in knowledge from the pre-presentation score out of five ($M = 3.26$) compared to their post-presentation score ($M = 4.26$) (t (18) = 3.082, $p = .006$). Furthermore, a per item analysis (McNemar non-parametric Chi-square test) showed that group knowledge acquisition occurred for the following three items as a result of the presentation: question 1 showed increased knowledge that PTSD is an anxiety disorder ($p = .008$); question 2 showed increased knowledge about nature of the three PTSD symptom clusters ($p = .016$); and question 4 showed increased knowledge about the types of events that can cause PTSD ($p = .031$) (see Table 3.1). There was no significant knowledge gain for questions 3 and 5 due to a ceiling effect, as most of the respondents provided the correct answer at baseline (i.e., pre-presentation).

With respect to whether or not the presentation influenced people's attitude about whether or not they intend to screen for PTSD in the future, the correlation between responses to the item measuring "intent to screen" and the item measuring "confidence in being able to do so" was extremely high ($r = .93$, $p < .001$). This high correlation suggests that self-efficacy is associated with behavioral intentions to change current practice. Anecdotally, those individuals who reported less of an intention to screen and less confidence in their ability to do so stated in writing that they felt more of this type of training was needed. The above information suggests that it is important that if session

attendees are to make changes to their current practice, they need to leave the workshop with a high sense of self-efficacy about implementing a screening process in their practice.

Subsequent to PTSD symptom screening workshop, the PI arranged for a two day workshop on treating PTSD in youth. The material covered came from an interactive web-based teaching tool on trauma-focused cognitive behaviour therapy (TF-CBT) for youth (National Crimes Victim & Treatment Centre, 2007; free training available on-line through the University of South Carolina at: http://tfcbt.musc.edu/). For continuity and coherence across KT initiatives, the same clinical psychologist who led the assessment workshop also facilitated the treatment workshop. Attendees were the project's community-champion, another guidance counselor, a psychologist from a nearby Mi'kmaq community, the mental health director of this community and selected staff, as well as one representative from NADACA for a total of 10. The purpose of the workshop was to introduce and familiarize the attendees with Trauma-Focused Cognitive-Behavioural Therapy (TF-CBT; Cohen, Mannarino, & Deblinger, 2006), and to stimulate the desire for further and more intense training in this therapeutic modality. The facilitating psychologist's role was to guide the group through the modules, while simultaneously encouraging discussions about the cross-cultural applications of the content. Attendees were given printed scripts for each module in advance, which included step-by-step instructions for each intervention. With the aid of a projector and internet connection, the facilitating psychologist was able to cover 5 modules each day, responding to questions and concerns as they arose.

The TF-CBT Web course comes with its own standardized pre and post module knowledge tests, allowing for an objective indicator of knowledge acquisition. Table 3.2 gives information on the group's pre-post scores for each module with significant knowledge acquisition occurring in 3 of 9 modules (test information was not available for module 10). Specifically, the group showed knowledge acquisition in modules 1, 8, and 9: psychoeducation, cognitive processing of the trauma narrative, and behavioural management strategies. Furthermore, given the high pretest score (3.2 out of 4) for module 3 (relaxation training), a result comparable to that reported by the TF-CBT Web developers, it is likely that a ceiling effect limited the potential for knowledge acquisition in this module (National Crimes Victim & Treatment Centre, 2007). Due to missing data—not all attendees were present for all modules and no data could be collected for module 10 (see Table 3.2)—a total score consisting of the sum of all modules could not be calculated. However, for the group as a whole, based on the modules that were completed, a paired sample t-test revealed a significant learning differential of 5.3 points, $t\,(9) = 4.19$, $p < 0.01$. Taken as a whole these results suggest that the small group of attendees left with a better understanding of TF-CBT.

The last workshop that was arranged for this community was a workshop on resilience by a national expert in the field. Current models of resilience depart from earlier conceptions that strictly emphasized individual factors (Anthony, 1987; Kaplan, 1999). Contemporary models are now shifting towards ecological interpretations (Lerner & Benson, 2003; Ungar, 2001). More recently, resilience has been described as both an outcome of interactions between individuals and their environments (e.g., abusive home life; positive school life), and the processes (e.g., engagement with more positive adult

role-models) which contribute to these outcomes (Ungar et al., 2007). Workshop attendees consisted of representatives from community agencies whose mandate involved youth (e.g., schools, MH & SWS, RCMP). The workshop commenced with a presentation by the PI on recent findings from the community that involved resilience. Specifically, the attendees learned that resilience moderated (buffered) the impact of exposure to violence on PTS reexperiencing symptoms (symptoms like intrusive memories and nightmares) in community youth (see Zahradnik, et al., 2009). In other words, when community youth were exposed to high levels of violence, youth high in resilience experienced less PTS reexperiencing symptoms than youth low in resilience. The workshop facilitator spent the rest of the morning discussing the construct of resilience in greater detail while the afternoon focused on selecting cases from the community that the service providers found challenging. Although no outcome data is available to index knowledge enhancement for this endeavor, a future collaborative partnership between the workshop leader and the community was discussed.

With the success of the PTSD symptom screening workshop, the TF-CBT Web workshop, the resilience workshop, the student presentations, and the progression towards addressing the reason why some students seem reluctant to consult with a guidance counselor or social worker, there is growing evidence that, as a function of our collaborative research partnership, the community is slowly becoming better equipped to deal with PTSD and its associated complications.

Future Directions and Lessons Learned

Based on an interview with the mental health director—who has acted as a key informant (Tremblay, 1957)[17] with respect to issues pertaining to mental health and wellness in the community—there are still challenges to overcome. First, screening for PTSD symptoms has begun; however, there is a continued reluctance to formalize such screening by way of standardized tools. Reportedly, this is due to the fact that the broader networks of mental health service providers who work with the various Mi'kmaq communities in this region prefer to maintain an informal atmosphere with their clients. Another possible method by which to ensure consistency of screening approaches would be to organize occasional PTSD-symptom-screening-booster-sessions. Further to this issue is the community-wide need for more training in the screening and treatment of anxiety disorders in general. This echoes some of the feedback from the screening workshop, in which a few individuals desired a greater understanding of differential diagnosis. Although the research has increased the community's awareness and knowledge of PTSD, it has simultaneously revealed another area in which the community service providers have requested more training. Furthermore, with respect to the TF-CBT Web workshop, published work that examines how Aboriginal clients respond to treatment modalities like CBT is only beginning to emerge. There is some evidence that non-acculturated Aboriginal clients (i.e., stronger identification with their own culture) may not agree with the rationale of how CBT works and by extension certain activities like linking thoughts to feelings, but do appreciate CBT's use of active and present

[17] The term key informant is used in the sense first employed by Tremblay (1957, p. 689) to designate an individual who provides information for "the study of specific aspects of a cultural setting… by individuals with specialized information on a specific topic "…rather than the cultural whole usually detailed in ethnographies."

focused interventions (see Jackson, Schmutzer, Wenzel, & Tyler, 2006). A great deal of the workshop was spent on discussing these very issues with no firm conclusions being reached. The choice to offer this community a best-practice model of treatment (Cohen & Mannarino, 2008) was made with the understanding that more research needs to examine whether these non-Aboriginal best-practice models of treatment apply equally well to Aboriginal communities (including both acculturated and non-acculturated individuals). It remains a question for future collaborative partnerships between researchers and Aboriginal communities to determine which aspects of CBT should be modified so as to increase cultural acceptability of the intervention without decreasing its overall effectiveness.

Another issue that has arisen is how to keep the broader community of service providers actively discussing and learning about issues around interpersonal trauma and PTSD. Attempts at inviting individuals to join a list serve did not meet with much success, despite the fluency with on-line communication and computing resources. This served as a reminder to the PI that the community service providers are not only overworked with their case loads, but are constantly attending workshops and training put on by other health focused organizations. The questions of whether or not this community makes use of the web-based tools in the same manner as others, and how to make these list-serves more relevant to the community service providers still need to be addressed.

Finally, there still exists a relatively entrenched culture of silence around sexual assault and healthy sexuality for youth. The mental health director speculates that more education around these issues is a necessary step towards progress, and raised the issue of

how lateral violence (LV) may preclude open discussion of assaults in close relationships. LV is a term more widely cited in the nursing literature (e.g., Stanley, Martin, Michel, Welton, & Nemeth, 2007), but its origin can be traced back to Freire's (1971) *oppressed group model* and description of horizontal violence. Some examples of LV include: non-verbal innuendo, verbal affront, undermining activities, infighting, scapegoating, backstabbing, failure to respect privacy, and broken confidences (Griffin, 2004). If this dynamic exists between peers, it would likely engender a reluctance to trust, a reluctance that may also manifest itself with respect to the family and community more broadly when acts of physical or sexual violence occur (Thibodeau & Peigan, 2008).

The community maintains a concern for its youth. Importantly, many of the community service providers now have a much clearer understanding of the specific problems their youth are dealing with, and how these problems often co-occur in a meaningful way. Our collaborative work has helped the community identify ways in which they can begin to respond to some of these problems (e.g., training in the identification and management of PTSD symptoms). Furthermore, the community professional services are now directly addressing early intervention for sexual assault and reviewing prevention strategies. We believe that our partnership with this community has the potential to lead to further collaborative integrative KT work. We also hope that it will provide some guidance to researchers and Aboriginal communities who, with the unified purpose of supporting the recovery and resilience of youth in their communities, wish to embark upon a reciprocal journey towards knowledge discovery, exchange, and application.

Table 7.1.

PTSD Screening Workshop Knowledge Test Scores at Pretest and Posttest

Question1**		
	Post-test	
Pre-test	Incorrect	Correct
Incorrect	0	8
Correct	0	10
Question2*		
	Post-test	
Pre-test	Incorrect	Correct
Incorrect	5	7
Correct	0	6
Question3		
	Post-test	
Pre-test	Incorrect	Correct
Incorrect	1	1
Correct	0	15
Question4*		
	Post-test	
Pre-test	Incorrect	Correct
Incorrect	1	6
Correct	0	11
Question5		
	Post-test	
Pre-test	Incorrect	Correct
Incorrect	0	2
Correct	0	16

Notes. Questions 1, 2, and 4 are in bold because they are significant according to a McNemar test where * = significant at .05, ** = significant at .01. Values in the Correct (row)-Correct (column) areas represent respondent responses that were correct at both pre-test and post-test, while values in the Incorrect (row)-Correct (column) areas represent respondent responses that were incorrect at pre-test but correct at post-test.

Table 7.2.

Trauma Focused-Cognitive Behavioural Therapy Web Workshop Knowledge Test Scores at Pretest and Posttest

Module	Pretest *M* (*SD*)	Posttest *M* (*SD*)	Difference
1: **Psychoeducation** N=10	1.40 (0.70)	2.80 (1.4)	**+ 1.4** ***t*=2.80 *p*<.05**
2: Controlled Breathing N=10	2.40 (0.52)	2.90 (1.0)	+0.50
3: Relaxation N=10	3.20 (1.03)	3.70 (0.67)	+0.50
4: Thought Stopping N=9	1.67 (0.87)	1.44 (0.88)	-0.23
5: Affect Expression N=10	2.20 (1.03)	2.60 (0.97)	+0.40
6: Cognitive Coping N=10	2.50 (0.97)	2.80 (0.79)	+0.30
7: Trauma Narrative N=6	2.00 (0.63)	2.67 (0.82)	+0.67
8: **Cognitive Processing** N=9	1.00 (1.32)	2.44 (0.88)	**+1.44** ***t*=3.50 *p*<.01**
9: **Behavioural Management** N=8	2.00 (0.53)	2.88 (0.83)	**+0.88** ***t*=3.90 *p*<.01**
10: Parent-Child Sessions	-	-	-

Notes: Modules in **bold** showed significant knowledge improvement. *M* = mean, *SD* = standard deviation.

CHAPTER 8. DISCUSSION

The purpose of this dissertation was threefold. The first goal of this research was to test the self-medication hypothesis by demonstrating that specific PTS symptoms statistically mediate the relationship between EV and alcohol misuse (Study 1). The second goal of this research was to explore how the construct of resilience can protect youth who have been exposed to violence from developing more severe symptoms of psychological distress (e.g., PTS) (Study 2). The third and final goal of this research program was to document the many steps involved in its implementation and the community-based dissemination of the results, so as to provide a positive model for building and sustaining a collaborative research relationship between an aboriginal community and non-aboriginal researchers (Study 3). As detailed discussions of the results were provided in the individual manuscripts, this discussion will provide a brief summary and integration of the key novel findings. It will also more broadly articulate the strengths, limitations, future directions, and clinical/research implications of the overall research program.

Summary and Integration of Main Novel Findings

Consistent with expectations, Study 1 demonstrated statistical support for the self-medication hypothesis by demonstrating that PTS hyperarousal symptoms fully mediated the relationship between EV and alcohol misuse. This relationship persisted while controlling for depressive symptoms and both age and gender. Re-experiencing, Numbing, and Avoidance symptoms were also predicted to mediate the relationship between EV and alcohol misuse, but these symptom clusters were found not to predict

alcohol misuse once depressive symptoms were controlled for. Results from this study provide evidence that hyperarousal symptoms, compared to other PTS symptoms, best explain the relationship between EV and alcohol misuse.

Study 2 explored how the construct of resilience might operate as a protective factor between EV and one of its primary outcomes, PTS. Our measure of resilience was found to have a 3 component structure, suggesting that the measure taps into aspects of personal, family, and community oriented resilience. As expected, resilience—measured either globally or by its components—was found to correlate negatively with PTS, allowing for an examination of potential moderating effects between EV and PTS. Unexpectedly, resilience did not moderate the relationship between EV and total PTS symptoms. However, when examining whether or not resilience moderated the relationship between EV and the individual symptom clusters of PTS, a significant moderating effect of resilience was found to occur between EV and PTS reexperiencing symptoms. This moderating effect was consistent across all three aspects of resilience (i.e., personal, family, and community).

While Study1 demonstrates how the hyperarousal symptom cluster of PTS explains the relationship between EV and alcohol misuse in this sample, Study 2 described moderating results for a different PTS symptom cluster, the reexperiencing cluster. It would have been encouraging to learn that resilience also moderated the relationship between EV and the expression of PTS hyperarousal symptoms, but such was not the case. Thus, this finding suggests that although the cardinal symptom of PTS (i.e., reexperiencing symptoms) might be buffered by resilience, other important PTS symptoms (e.g., hyperarousal) are not. This indicates that reducing youth levels of PTS

in the community will require intervention in multiple domains. Study 3 articulates my attempts to facilitate such initiatives.

In addition to articulating how I went about forming and maintaining a collaborative research partnership with a Nova Scotian Mi'kmaq community, Study 3 highlighted my KT initiatives – initiatives intended to help the community address issues pertaining to PTS in their youth. Feedback to community stakeholders was given both verbally in the form of small group presentations, as well as in document form (e.g., a technical report). This information helped concerned stakeholders better understand how PTS symptoms might be affecting the lives of community youth, and galvanized stakeholder support for using school time to increase youth awareness of PTS. It also identified a need for community service providers who work in direct contact with youth to improve their knowledge around issues related to PTS. To this end, arrangements were made to provide training to community service providers in both the screening/assessment of PTSD as well as the treatment of PTSD. Data obtained on knowledge uptake for these endeavours showed significant differences between scores on pre-tests and post-tests, as well as an increased willingness to use this new knowledge. Furthermore, the community was also provided with a full day interactive workshop on ways to increase resilience in youth. Together, these three studies document the process of working collaboratively with a First Nations' community to first address a series of questions that were important to both the community itself as well as to the field of PTSD research more broadly, and secondly, to help the community act on some of the answers provided.

Strengths, Limitations, and Future Directions

Although many of the strengths and limitations of this body of research have been documented above, synthesized description seems warranted. One of the strengths of this research program is that instead of sampling individuals from the majority culture, it instead worked collaboratively with a First Nations community. This is particularly important given that the field of psychology is becoming increasingly aware of its responsibility to conduct cross-cultural mental health research (Pederson, Carter, Ponterotto, 1996), and that Canadian Aboriginal researchers are stressing the importance of conducting ethically sound research with Canadian Aboriginal communities (e.g., Castellano, 2004). With respect to Study 1, one of its principle strengths is that it shed new light on previous research that has tested whether PTSD is a mediator between trauma and alcohol misuse (e.g., Prigerson et al., 2002; Ullman et al., 2005; White & Widom, 2008; and Zlotnick et al., 2006), by focusing on PTS symptom clusters, and not just total PTS symptoms. Furthermore, it did so controlling for theoretically relevant variables like age, gender, and depression. Similarly, with respect to Study 2, measuring both the symptom clusters of PTS and components of resilience meant that an important finding was not overlooked (i.e., that resilience moderated or buffered the relation between EV and PTS reexperiencing) and that different aspects of resilience (i.e., individual, family, and community) all play an equally important part in this buffering process. More general strengths include the fact that the passive consent process used in data collection ensured that sample bias—in the form of an under-representation of youth exposed to violence at home—did not occur. Additionally, the results of Studies 1 and 2 were obtained largely using measurement tools (self-report questionnaires) that have been

used in First Nation communities before. This last point is particularly important since this research program is one of the first to examine four well studied phenomena (EV, PTSD, alcohol misuse, and resilience) together in collaboration with a First Nation community.

A strength of the research process more generally, as alluded to above, is that this research program was able to integrate important aspects from two research traditions (cf., Hughes, 2003)—the investigator driven research model (e.g., Coie et al., 1993; Weissberg & Greenberg, 1998) and the participatory action research model (Lewin, 1946). This integrated approach is at the heart of what CIHR (2008a) calls integrated knowledge translation (KT). Employing an KT approach meant that the university-based researcher was able to bring theoretical and empirical knowledge in a transparent and accessible manner to the community, and that this knowledge was added to community-based knowledge to help address a problem that the community identified as a concern (i.e., youth alcohol misuse). Furthermore, because the community was in control of the research process, and was involved in all aspects of the decision making, the problem was addressed in a manner that was consistent with the values and concerns of the community. As a result, what became evident to the community-based service providers working with youth was how a less observable and talked about problem (i.e., youth suffering from PTS symptoms as a consequence of EV) was actually influencing the more observable problem of youth alcohol misuse. Subsequently, this lead to action-based recommendations—increasing knowledge about PTSD and the construct of resilience—that were of tangible benefit to the community.

The strengths of this research program must also be understood within the context of the work's limitations – limitations that suggest future directions for research. A noteworthy limitation of the research as a whole is that it relied on a school-based sample, which given the link between EV and early school dropout (Kaplow & Widom, 2007), suggests that our sample may not have included youth who are struggling with more severe forms of distress and dysfunction as a consequence of EV. As such, the results of study 1 might not be stable if one includes individuals with more extensive histories of EV with more severe and complicated sequelae. Also of note, the results of study 2 might have been affected by the fact that youth with less resilience might not have participated in the study, potentially minimizing our moderating effect. A principle methodological limitation of the research was its cross-sectional design, and subsequent reliance on retrospective reporting. As pointed out earlier, the retrospective reporting of EV can increase the possibility of underreporting as the time period between the abuse and the retrospective report increases (Hardt & Rutter, 2004). Furthermore, the exclusive use of self-report measures makes our findings potentially susceptible to bias byway of common method variance. Additionally, the design of the study did not keep track of traumatic events that can occur in addition to EV (e.g., motor vehicle accident, discovery of a suicide), limiting our capacity to ascertain whether EV is the primary trauma for some of the study participants. Also, because of the small sample size, and to avoid inflating Type I error, we did not explore the effects of each type of exposure to violence (physical abuse, sexual abuse, emotional abuse, and exposure to domestic violence) separately. Future research will need to examine whether each type of EV is differentially related to PTS, depression, alcohol misuse. Further to this, the longstanding

negative consequences of EV are further compounded by life stresses, as Jaffee et al., (2007, p. 233) have pointed out "children who are maltreated tend to grow up in multi-problem families characterized by poverty,… parent psychopathology, criminality, drug and alcohol problems, and dangerous neighborhood conditions." These may not all be experienced as traumatic per se, but they likely covary with both the severity of PTS symptoms and alcohol misuse, a point to be addressed shortly.

Also, using a cross-sectional design does not allow for strong conclusions about the direction of causation with respect to onset of PTS symptoms and alcohol misuse respectively. For example, alcohol abuse can, by way of intoxication or withdrawal symptoms, either intensify or mimic PTSD arousal symptoms (Saladin, Brady, Dansky, & Kilpatrick, 1995; Stewart et al., 1998). Consequently, our design does not allow us to rule out the possibility that EV could have lead to alcohol use which in turn contributed to arousal symptoms as a function of alcohol withdrawal. Employing a cross sectional design further limited our ability to test the mutual maintenance theory over time. Another limitation, specific to the results of Study 1 is that large sample sizes are needed when testing several potentially relevant variables together. We did not have the sample size to test a model in which all four PTS symptoms were entered simultaneously. Furthermore, our sample size precluded us from measuring other important covariates (e.g., stressful life experiences). When variables that are likely to covary with the both the mediator and the dependent variable are left out of mediation equations, overestimated effects of mediation can occur (Bullock, Green, & Ha, 2010). Study 1 controlled for three such variables—age, gender, and depression—but other important variables like drug use (Kilpatrick et al., 2000), or stressful life experiences (Jaffee et al.,

2007) were not controlled for. Also of note, the relatively lower alphas observed for the measures of the three other PTS symptom clusters may have artificially attenuated the potential mediating role of each of these symptom clusters. And finally, it is possible that the results of Study 1 are somewhat culture bound given the tendency for First Nations people to experience their anxiety more somatically than emotionally (Barker-Collo, 1999); thus, future research should look to replicate and extend these results in other cultural groups.

The abovementioned limitations highlight the fact that knowledge production is an iterative process. Our mediation results from Study 1, though not a first step per se since other studies have found support for the mediating role of overall PTSD symptoms (e.g., White & Widom, 2008), need to be replicated and extended. First, and foremost though, our results speak to the necessity of measuring and analyzing the effect of individual PTS symptom clusters. That being said, researchers interested in the mediating role of PTS would benefit from considering the following with respect to replicating and extending the results of Study 1. Replicating these results in other First Nation communities, as well as well as the population more broadly, will allow for stronger claims about the generalizability of the presented results. Such attempts should also make use of prospective designs (see White & Widom, 2008) to allow for more definitive comments about the temporal sequencing of key variables. However, replication attempts should make use of larger sample sizes in order to test the contribution of theoretically and empirically relevant third variables such as stressful life events (White & Widom, 2008) or comorbid drug use (Kilpatrick et al., 2000).

Future research in this area will require larger sample sizes so as to allow for the possibility of directly testing participant motivation for alcohol use by including a measure of this construct, specifically a measure that distinguishes between motivations to reduce anxiety and motivations to reduce depression (i.e., with the Modified Drinking Motivation Questionnaire – Revised; Grant, Stewart, O'Connor, Blackwell & Conrod, 2007). Furthermore, a larger sample size would also allow for a moderated mediation analysis (Edwards & Lambert, 2007; Muller, Judd, & Yzerbyt, 2005) to investigate whether or not resilience might moderate the previously reported mediation findings. Answering this question might help identify positive ways in which victims of EV experience and navigate through their environment to secure resources (e.g., support) that protect them from developing more severe PTS symptoms or drinking behaviour. A final point is that given that alcohol is not the only substance thought to be used to self-medicate PTSD symptoms (Read, Brown, & Kahler, 2004; Stewart & Conrod, 2003), the abovementioned recommendations should be considered when conducting mediation studies where different types of drugs (e.g., cocaine, marijuana) are used as outcome variables.

With respect to the resilience findings, it is important to recognize that the results of Study 2 are only a beginning, in that they describe a relationship, but do not directly offer an explanation as to why resilience moderates the relation between EV and PTS reexperiencing symptoms. Given that creators of the Child and Youth Resilience Meausre (CYRM) have acknowledged that "health resources related to resilience are perceived, valued, and employed in different ways by different youth populations" (Ungar & Liebenberg, 2009, p. 268), replication in a different youth population is needed

to determine whether or not this finding generalizes beyond this community sample. Future work of this kind might consider including a qualitative interview component for follow up, similar in nature to the ones used to develop the CYRM (cf., Ungar et al., 2007), but modified to more explicitly probe coping with exposure to violence. Questions could then be posed to youth who have been identified as reporting high levels of EV and both high and low levels of resilience, in order to better understand and identify the processes that make violence-exposed youth who report more resilience less likely to experience more severe PTSD re-experiencing symptoms than those violence-exposed youth who report less resilience. A similar process has been used with Mi'kmaq adolescents (Comeau, Stewart, Loba, & Theakston, 2004) to enhance previous quantitative findings that focused on these particular youths motivations to use alcohol (Comeau, Stewart, & Loba, 2001). Such qualitative data was ultimately used in designing and piloting culturally relevant early interventions (Comeau, Stewart, & Conrod, 2004 a, b, c) that have shown to be promising in reducing alcohol use in Mi'kmaq adolescents (Comeau, Stewart, & Conrod, 2004 a, b, c; Mushquash et al., 2007, Mushquash, Comeau, McCleod, & Stewart, 2008). Future collaborative research with this community might also follow up with the schools to see if youth PTS symptoms and alcohol misuse are reduced and if students are more aware of PTSD since this dissertation research was conducted.

Clinical Implications

From a community standpoint, the clinical implications of this research were addressed in Study 3. This collaborative partnership helped community stakeholders better realize the extent to which youth were struggling with PTS symptoms, and how

these symptoms were functionally related to alcohol misuse. To that end, Study 3 reviewed the PTS focused community-based presentations and training workshops that were provided to the relevant service providers, and documented the knowledge acquisition that was achieved. Overall, with respect to the results of studies 1 and 2, additional research needs to be conducted before strong conclusions regarding intervention and treatment can be made. That being said, the results of Study 1 support a growing number of studies (Epstein et al., 1998, White & Widom, 2008, Zlotnick et al., 2006) that provide evidence for the mediating effect of some aspect of PTS in explaining the relation between EV and alcohol misuse.

The findings from Study 1 are consistent with a variety of literature that has direct clinical implication for the treatment of individuals who have both PTS symptoms and misuse alcohol: though the literature below often makes reference to individuals with diagnoses of both PTSD and substance use disorders (SUD). In the last decade, the functional relationship between PTSD and alcohol/substance misuse is beginning to be elucidated through studies that involve experimental manipulation. For example, researchers have used laboratory based studies (Coffey et al., 2006; Saladin et al., 2003) to demonstrate how substance cravings increase when individuals with comorbid PTSD—SUD undergo experimentally induced traumatic memories, but decrease when trauma-related negative affect is decreased by exposure-based techniques (Coffey et al., 2006). While the above literature focuses on PTSD-SUD, and not exclusively on PTSD-AUD comorbidity, the results of Study 1 suggest that lab-based research that specifically examines the functional link between PTSD symptoms and AUD specifically should consider manipulations that will allow researchers to index changes in hyperarousal

symptoms. Results from such a design could offer further validation of the efficacy of using exposure based therapy to treat individuals who are in the early stages of misusing alcohol to reduce or cope with their PTSD symptoms.

The laboratory findings discussed above are consistent with several preliminary clinical studies that have found that decreases in the amount of PTSD symptoms in individuals with comorbid PTSD-SUD can positively impact symptoms related to substance dependence (Back, Brady, Sonne, & Verduin, 2006; Brady, Dansky, Back, Foa, & Carroll, 2001; Coffey et al., 2006; Ouimette et al., 2003). Indeed, in the largest RCT on treatment for individuals with comorbid PTSD-SUD to date, Hien et al. (2010) showed that for every drop in a discreet unit of PTSD symptoms (using the Clinician-Administered PTSD Scale), there is a 4.6% decrease in the odds of being a heavy substance user at follow-up. Additionally, the study by Back and colleagues (2006) not only showed that SUD symptoms improved as a function of changes of PTSD symptoms, but that only improvement in the PTSD symptom cluster of hyperarousal was significantly related to alcohol treatment response (Back et al., 2006). This finding is commensurate with the findings reported in Study 1 of this work and further support the notion that therapists working with individuals with both PTSD symptoms and alcohol use symptoms would do well to consider using a treatment that specifically targets PTSD arousal symptoms. However, treating only the PTSD symptoms may be an effective early intervention strategy if the alcohol use is addressed early on its development, but individuals with a longer and/or more severe alcohol use disorder will likely require a treatment strategy that addresses both disorders, such as an integrated treatment.

Integrated models of treatment for comorbid anxiety disorders (such as PTSD) and substance use disorders (such as alcohol dependency) recognize the complex interrelation between the two disorders and the possibility of mutual maintenance (Randall, Book, Carrigan, & Thomas, 2008) and therefore attempt to create a hybrid treatment that combines the major elements from those treatment protocols/standards that have proven to be effective in treating each disorder independently (Zahrandik & Stewart, 2008). To this end, there are two treatment programs that report encouraging results for treating individuals with both PTSD and SUD by using an integrated cognitive therapy approach for substance use and exposure therapy for PTSD: the Concurrent Treatment of PTSD and Cocaine Dependence (CTPCD; Brady et al., 2001) and the Substance Dependence PTSD Treatment (SDPT; Triffleman et al., 1999). A third treatment, Seeking Safety (Najavits, Weiss, Shaw, & Muenz, 1998), which also uses cognitive-behavioural interventions for substance misuse and PTSD, but no trauma related exposure, is perhaps the most studied manualized intervention for comorbid PTSD-SUD (Desai, Harpaz-Rotem, Najavits, & Rosenheck, 2008; Gatz et al., 2007; Hien, Cohen, Miele, Litt, & Capstick, 2004; Najavits, Gallop, & Weiss, 2006; Cook, Walser, Kane, Ruzek, & Woody, 2006; Najavits et al., 1998; Zlotnick, Najavits, & Rohsenow, 2003). Interestingly though, the largest RCT on Seeking Safety to date, with a sample of 353 women, demonstrated that Seeking Safety, although effective in reducing PTSD symptoms, was no more effective in reducing these symptoms than an active health education group (Hien et al., 2009). The authors suggest that adding an exposure-based component (e.g., Foa, Rothbaum, Rigs, & Murdock, 1991) could improve efficacy. This suggestion is consistent with the results of one study (Najavits, Schmitz, Gotthardt,

& Weiss, 2005) that demonstrates that Seeking Safety can be effective when it also includes an exposure-based component specifically related to PTSD. As such, it would seem that further clinical trials of Seeking Safety would benefit from comparing the standard protocol against a modified version of itself that includes an exposure component.

In summary, available evidence suggests that individuals with comorbid PTSD-SUD will benefit from integrated treatments that target both sets of symptoms, but that SUD symptoms appear to improve as PTSD symptoms improve. Furthermore, there is converging evidence that this effect (SUD symptoms decreasing as a function of PTSD symptoms) might be best accounted for by decreases in the PTSD symptoms of hyperarousal and reexperiencing specifically. The results of Study 1 add to this literature by supporting the specificity and importance of the hyperarousal symptom cluster.

When discussing the clinical implications of resilience-focused research, it is important for researchers to be specific about the nature of the observed positive adaptation(s) that has/have occurred in the face of a clearly defined risk(s) (Luthar & Zelazo, 2003). This specificity can help ensure that when researches are describing their findings they avoid overly global statements by "limiting their conclusions to the precise domains in which resilience is manifested" (Luthar et al., 2000, pp. 554-555). In the case of Study 2, EV was used as the clearly defined risk factor and positive adaptation was the absence of psychopathology, or more specifically, PTS reexperiencing symptoms. In this way, Study 2 partially utilizes a framework in which positive adaptation is defined as the absence of psychopathology in high-risk samples, a framework common in resilience research that is trauma or health related (e.g., Alim et

al., 2008; Parry et al., 2008, Tiet et al., 1998). However, the limitation of relying solely on this framework is that only measuring the absence of a phenomenon (e.g., psychopathology) doesn't provide information about what factors might be associated with the absence of said phenomenon. Study 2 addressed this limitation by using a measure of resilience (the CYRM) that provides some benchmark for what might constitute cross-cultural protective factors and processes (Ungar, 2010). Specifically, based on item endorsement patterns by the students in our sample (i.e., an exploratory component analysis), these protective factors and processes were grouped into individual (e.g., "strive to finish what you start"), family (e.g., "feel that your parents watch you closely), and community (e.g., "treated fairly in your community") domains. This particular constellation of domains is entirely consistent with longitudinal research on trauma related resilience. In her literature review, which synthesized the results of 10 USA-based longitudinal studies on resilience as well studies from Great Britain, New Zealand, Australia, and the Scandanavian countries, Werner (2005) demonstrated that the assets most strongly associated with resilience in the face of childhood abuse consistently fell in the domains of the individual, family, and community. Our results, in light of Werner's research, suggests that the CYRM might best be conceived of as a measure of assets in the domains of the individual, family, and community, that measured separately or together, lead to resilience against PTS reexperiencing symptoms. That the CYRM measures assets and not resilience directly is more a function of how resilience is conceptualized, and not a shortcoming specific to the CYRM itself. Thus the results of Study 2, though not specific as to the exact psychopathology-buffering-ingredients of

each domain, do give resilience researchers a useful clinical road map for further investigation.

What's more is that this clinical road map does not seem to be specific to our sample alone, but may apply to victims of EV more generally. A recent study by Fincham, Altes, Stein, and Seedat (2009), with a sample of 787 school attending South African children found that resilience moderated the relationship between childhood abuse and symptoms of PTSD. This study was similar to Study 2 in that it too measured resilience directly, albeit with a measure of individual resilience (Connor-Davidson Resilience Scale: CD-RISC; Connor & Davidson, 2003). Although Fincham and colleagues (2009) did not use a measure of resilience that operationalized resilience to include family and community processes and factors, they nonetheless concluded their article by acknowledging how the "development and maintenance of close relations with supportive adults and family members, effective schooling systems, and perceived social support from the community at large" (Fincham et al., 2009, p. 199) can bolster individual resilience (Cluver, Fincham, & Seedat, 2009; Luthar et al., 2000; Vranceanu, Hobfoll, Johnson, 2007). As a whole, research in the area of resilience, as manifested by individuals at risk for PTSD based on EV, is pointing health professionals towards utilizing a broader spectrum of strategies for intervention. For communities with youth under stress, Study 2 suggests that community-based interventions that exist outside of a clinical setting, but not in place of, should be explored. More specifically, and in line with recommendations made by other researchers in the field of community resilience (e.g., Brennan, 2008), local support structures that encourage social networks, youth leadership, youth-adult/elder partnerships, and mentoring relationships should be

established or enhanced through appropriate community services and agencies (e.g., schools, community-clubs, band-council, social work services etc.).

Seccombe (2002) argued that building resilience in communities is more than just helping youth beat the odds – it is about changing some of those odds. Taken as a whole, the impact of this research program on the community was by all accounts positive. As described more precisely in Study 3, community members were actively involved in the project planning, data-collection, and dissemination components of this research, in a manner consistent with what CIHR calls Integrated Knowledge Translation (CIHR, 2008a). Thus, when one considers the following: the presentations about the inter-relatedness of EV, PTS, and alcohol misuse to a variety of community audiences; both the teacher-focused and youth-focused PTSD psychoeducation presentations; the release of a confidential technical report on the base-rates of the studied variables in the community to mental health and social work services for funding proposals; the PTSD assessment/screening training and subsequent youth-focused trauma treatment training received by various community service-providers; and the one day workshop on enhancing community resilience in youth, it is reasonable to conclude that this community is better equipped to lower the odds that youth will live with undetected symptoms of PTS and raise the odds that some of these youth will engage in coping strategies that do not rely on self-medication with alcohol.

Conclusion

This research program resulted in two important empirical findings as well as a thoroughly documented approach to conducting collaborative research with a First Nations community. The first empirical finding was that PTS hyperarousal symptoms

mediated the relationship between EV and alcohol misuse. This finding adds specificity to a body of work that hitherto has only examined the mediating role of total PTSD/PTS symptoms and that has not examined individual symptom components. The second empirical finding was that a direct measure of resilience (including individual, family, and community domains) demonstrated a moderating (buffering) effect on the relation between EV and PTS reexperiencing symptoms. The final part of this research program was a documentation of the research process itself, including some outcome information on the action-based recommendations that were requested by the community and initiated upon by myself. As a whole, this document has demonstrated how a community-based collaborative research process can produce novel findings that can make valuable contributions to both the scientific literature and to the host community itself.

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APPENDIX A

Demographics and Substance Use Questions

Please ensure that the number on the top right hand corner of your questionnaire package matches the number on the top right hand corner of your bubble sheet.

***Directions*:** Please read the following statements carefully and fill in the corresponding letter for your response on the right hand side of your bubble sheet, beginning with number 1. Choose the response that best describes you. Describe yourself as honestly and as accurately as possible.

1. What age are you?
   - A 14 or younger
   - B 15
   - C 16
   - D 17
   - E 18 or older

2. What is your gender?
   - A Female
   - B Male

3. What is the highest grade you have completed?
   - A 8^{th}
   - B 9^{th}
   - C 10^{th}
   - D 11^{th}
   - E 12^{th}

4. How do you identify yourself?
   - A. First Nations
   - B. Other

5. What is your family's income**? If you don't know or are not sure, please leave the question blank.**
   - A. Less than $10,000/yr
   - B. Between 10,001-$24,999/yr
   - C. $25,000-$40,000/yr
   - D. $40,001-$55,000/yr
   - E. More than $55,000

Quantity and Frequency of Substance Use

6. Have you ever consumed alcohol in the past four months? (If No, please go directly to question 10)

A No
B Yes

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

A 1 or 2
B 3 or 4
C 5 or 6
D 7 to 9
E 10 or more

1 drink =

1 Glass of Wine **1 Can or bottle of beer** **1 Shot of hard liquor** **1 Cooler**

8. How often do you usually drink?

A Less than monthly
B Once a month
C 2 or 3 times a month
D Weekly
E Daily or almost daily

9. How often do you have six (five if you are female) or more drinks on one occasion?

A Never
B Less than monthly
C Monthly
D Weekly
E Daily or almost daily

10. Have you ever used marijuana in the past four months?

A No
B Yes

11. If yes, to question 10, how often do you usually use marijuana (grass or dope)?
    A Less than monthly
    B Once a month
    C 2 or 3 times a month
    D Weekly
    E Daily or almost daily

12. Have you ever used solvents (glue / gas) to get high in the past four months?
    A No
    B Yes

13. If yes, to question 12, how often do you usually use solvents to get high?
    A Less than monthly
    B Once a month
    C 2 or 3 times a month
    D Weekly
    E Daily or almost daily

14. Have you ever used OxyContin or other hard drugs or narcotics without a prescription in the past 4 months?
    A No
    B Yes

15. If yes, to question 14, how often do you usually use pills without a prescription?
    A Less than monthly
    B Once a month
    C 2 or 3 times a month
    D Weekly
    E Daily or almost daily

16. Do you smoke cigarettes?
    A No
    B Yes

*If you answered "Yes" to question #16, please continue onto #17. If you answered "No," please skip to the next page. Thank you.

17. About how many cigarettes do you smoke a day?
    A Less than 1
    B 1-5
    C 6-10
    D Half of a pack
    E 1 pack or more

APPENDIX B

Childhood Experience of Violence Questionnaire

This questionnaire asks about things that may have happened to you in your school, in your neighbourhood, or in your family. It will ask questions about some situations where you might have been hurt or afraid you were going to get hurt. All your answers will be kept strictly anonymous. All your answers are private. No one will ever be able to how you have answered on this form. If you need help or would like to talk to someone about any of these experiences please let us know so that we can put you in touch with the guidance department at your school. You will also be provided with a list of phone numbers and contact information to help you make contact with various trusted and helpful professionals.

******PLEASE DO NOT PUT YOUR NAME ON THIS FORM******

****MAKE SURE ALL OF YOUR ANSWERS ARE RECORDED ON THE BLUE SCORE SHEET****

18. Sometimes kids get hassled or picked on by other kids who say hurtful or mean things to them.

A) Never

B) 1 to 2 times

C) 3 to 5 times

D) 6 to 10 times

E) More than 10 times

How many times has this happened to you (if never, got to question 21)?

19. When did this happen?

Please mark all that apply

A) Before grade school

B) In grades 1 to 5

C) In grades 6 to 8

D) In high school

E) Is happening now

20. Who did this to you?

Please mark all that apply

A) Brother / Sister / Stepbrother / Stepsister

B) Kids at school

C) Kids in your neighbourhood

D) Boyfriend / Girlfriend

E) Other (please remember to also fill out E on the blue bubble sheet, and then print answer on the line)

_____

_____

_____

21. Sometimes kids get pushed around, hit or beaten up by other kids or a group of kids.

A) Never

B) 1 to 2 times

C) 3 to 5 times

D) 6 to 10 times

E) More than 10 times

How many times has this happened to you (if never, go to question 24)?

22. When did this happen?

Please mark all that apply.

A) Before grade school

B) In grades 1 to 5

C) In grades 6 to 8

D) In high school

E) Is happening now

23. Who did this to you?

Please mark all that apply.

A) Brother / Sister / Stepbrother / Stepsister

B) Kids at school

C) Kids in your neighbourhood

D) Boyfriend / Girlfriend

E) Other (please remember to also fill out E on the blue bubble sheet, and then print answer on the line)

_____

_____

_____

24. How many times have you ever seen or heard any one of your parents (step-parents or guardians) say hurtful or mean things to each other or to another adult in your home?

A) Never

B) 1 to 2 times

C) 3 to 5 times

D) 6 to 10 times

E) More than 10 times

If never, go to question 28.

25. When did this happen?

Please mark all that apply

A) Before grade school

B) In grades 1 to 5

C) In grades 6 to 8

D) In high school

E) Is happening now

26. Was the person who did this drinking alcohol at the time?

A) Yes

B) No

C) Don't know

27. Was the person who did this using drugs at the time?

A) Yes

B) No

C) Don't know

28. How many times have you ever seen or heard any one of your parents (step-parents or guardians) hit each other or another adult in your home?

A) Never

B) 1 to 2 times

C) 3 to 5 times

D) 6 to 10 times

E) More than 10 times

If never, go to question 32.

29. When did this happen?

Please mark all that apply.

A) Before grade school

B) In grades 1 to 5

C) In grades 6 to 8

D) In high school

E) Is happening now

30. Was the person who did this drinking alcohol at the time?

A) Yes

B) No

C) Don't know

31. Was the person who did this using drugs at the time?

A) Yes

B) No

C) Don't know

32. How many times has any one of your parents (step-parents or guardians) said hurtful or mean things to you?

A) Never

B) 1 to 2 times

C) 3 to 5 times

D) 6 to 10 times

E) More than 10 times

If never, go to question 36.

33. When did this happen?

Please mark all that apply.

A) Before grade school

B) In grades 1 to 5

C) In grades 6 to 8

D) In high school

E) Is happening now

34. Was the person who did this drinking alcohol at the time?

A) Yes

B) No

C) Don't know

35. Was the person who did this using drugs at the time?

A) Yes

B) No

C) Don't know

36. How many times has an adult spanked you with their hand on your bottom (bum), or slapped you on your hand.

A) Never

B) 1 to 2 times

C) 3 to 5 times

D) 6 to 10 times

E) More than 10 times

If never, go to question 41.

37. When did this happen?

Please mark all that apply.

A) Before grade school

B) In grades 1 to 5

C) In grades 6 to 8

D) In high school

E) Is happening now

38. Who did this to you?

Please mark all that apply.

A) Female

B) Male

C) Family member

D) Adult

E) Teenager

39. Was the person who did this drinking alcohol at the time?

A) Yes

B) No

C) Don't know

40. Was the person who did this using drugs at the time?

A) Yes

B) No

C) Don't know

41. How many times has an adult slapped you on the face, head, or ears?

A) Never

B) 1 to 2 times

C) 3 to 5 times

D) 6 to 10 times

E) More than 10 times

If never, go to question 46.

42. When did this happen?

Please mark all that apply.

A) Before grade school

B) In grades 1 to 5

C) In grades 6 to 8

D) In high school

E) Is happening now

43. Who did this to you?

Please mark all that apply.

A) Female

B) Male

C) Family member

D) Adult

E) Teenager

44. Was the person who did this drinking alcohol at the time?

A) Yes

B) No

C) Don't know

45. Was the person who did this using drugs at the time?

A) Yes

B) No

C) Don't know

46. How many times has an adult hit or spanked you with something like a belt, wooden spoon, or something hard?

A) Never

B) 1 to 2 times

C) 3 to 5 times

D) 6 to 10 times

E) More than 10 times

If never, go to question 51.

47. When did this happen?

Please mark all that apply.

A) Before grade school

B) In grades 1 to 5

C) In grades 6 to 8

D) In high school

E) Is happening now

48. Who did this to you?

Please mark all that apply.

A) Female

B) Male

C) Family member

D) Adult

E) Teenager

49. Was the person who did this drinking alcohol at the time?

A) Yes

B) No

C) Don't know

50. Was the person who did this using drugs at the time?

A) Yes

B) No

C) Don't know

51. How many times has an adult pushed, grabbed, or shoved you to hurt you?

A) Never

B) 1 to 2 times

C) 3 to 5 times

D) 6 to 10 times

E) More than 10 times

If never, go to question 56.

52. When did this happen?

Please mark all that apply.

A) Before grade school

B) In grades 1 to 5

C) In grades 6 to 8

D) In high school

E) Is happening now

53. Who did this to you?

Please mark all that apply.

A) Female

B) Male

C) Family member

D) Adult

E) Teenager

54. Was the person who did this drinking alcohol at the time?

A) Yes

B) No

C) Don't know

55. Was the person who did this using drugs at the time?

A) Yes

B) No

C) Don't know

56. How many times has an adult thrown something at you to hurt you?

A) Never

B) 1 to 2 times

C) 3 to 5 times

D) 6 to 10 times

E) More than 10 times

If never, go to question 61.

57. When did this happen?

Please mark all that apply.

A) Before grade school

B) In grades 1 to 5

C) In grades 6 to 8

D) In high school

E) Is happening now

58. Who did this to you?

Please mark all that apply.

A) Female

B) Male

C) Family member

D) Adult

E) Teenager

59. Was the person who did this drinking alcohol at the time?

A) Yes

B) No

C) Don't know

60. Was the person who did this using drugs at the time?

A) Yes

B) No

C) Don't know

61. How many times has an adult kicked, bit, or punched you to hurt you?

A) Never

B) 1 to 2 times

C) 3 to 5 times

D) 6 to 10 times

E) More than 10 times

If never, go to question 66.

62. When did this happen?

Please mark all that apply.

A) Before grade school

B) In grades 1 to 5

C) In grades 6 to 8

D) In high school

E) Is happening now

63. Who did this to you?

Please mark all that apply.

A) Female

B) Male

C) Family member

D) Adult

E) Teenager

64. Was the person who did this drinking alcohol at the time?

A) Yes

B) No

C) Don't know

65. Was the person who did this using drugs at the time?

A) Yes

B) No

C) Don't know

66. How many times has an adult choked, burned or physically attacked you in some other way?

A) Never

B) 1 to 2 times

C) 3 to 5 times

D) 6 to 10 times

E) More than 10 times

If never, go to question 72.

67. When did this happen?

Please mark all that apply.

A) Before grade school

B) In grades 1 to 5

C) In grades 6 to 8

D) In high school

E) Is happening now

68. Who did this to you?

Please mark all that apply.

A) Female

B) Male

C) Family member

D) Adult

E) Teenager

69. Did this ever involve a weapon like a knife or a gun?

A) Yes

B) No

C) Don't know

70. Was the person who did this drinking alcohol at the time?

A) Yes

B) No

C) Don't know

71. Was the person who did this using drugs at the time?

A) Yes

B) No

C) Don't know

72. Did anyone ever show their private parts to you when you didn't want them to?

A) Yes

B) No

If NO, go to question 78.

73. How many times did this happen to you?

A) 1 to 2 times

B) 3 to 5 times

C) 6 to 10 times

D) More than 10 times

74. When did this happen?

Please mark all that apply.

A) Before grade school

B) In grades 1 to 5

C) In grades 6 to 8

D) In high school

E) Is happening now

75. Who did this to you?

Please mark all that apply.

A) Female

B) Male

C) Family member

D) Adult

E) Teenager

76. Was the person who did this drinking alcohol at the time?

A) Yes

B) No

C) Don't know

77. Was the person who did this using drugs at the time?

A) Yes

B) No

C) Don't know

78. Did anyone ever make you show them your private parts to you when you didn't want them to?

A) Yes

B) No

If NO, go to question 84.

79. How many times did this happen to you?

A) 1 to 2 times

B) 3 to 5 times

C) 6 to 10 times

D) More than 10 times

80. When did this happen?

Please mark all that apply.

A) Before grade school

B) In grades 1 to 5

C) In grades 6 to 8

D) In high school

E) Is happening now

81. Who did this to you?

Please mark all that apply.

A) Female

B) Male

C) Family member

D) Adult

E) Teenager

82. Was the person who did this drinking alcohol at the time?

A) Yes

B) No

C) Don't know

83. Was the person who did this using drugs at the time?

A) Yes

B) No

C) Don't know

84. Did anyone ever threaten to have sex with you when you did not want them to?

A) Yes

B) No

If NO, go to question 90.

85. How many times did this happen to you?

A) 1 to 2 times

B) 3 to 5 times

C) 6 to 10 times

D) More than 10 times

86. When did this happen?

Please mark all that apply.

A) Before grade school

B) In grades 1 to 5

C) In grades 6 to 8

D) In high school

E) Is happening now

87. Who did this to you?

Please mark all that apply.

A) Female

B) Male

C) Family member

D) Adult

E) Teenager

88. Was the person who did this drinking alcohol at the time?

A) Yes

B) No

C) Don't know

89. Was the person who did this using drugs at the time?

A) Yes

B) No

C) Don't know

90. Did anyone ever touch the private parts of your body or made you touch their private parts when you did not want them to?

A) Yes

B) No

If NO, go to question 96.

91. How many times did this happen to you?

A) 1 to 2 times

B) 3 to 5 times

C) 6 to 10 times

D) More than 10 times

92. When did this happen?

Please mark all that apply.

A) Before grade school

B) In grades 1 to 5

C) In grades 6 to 8

D) In high school

E) Is happening now

93. Who did this to you?

Please mark all that apply.

A) Female

B) Male

C) Family member

D) Adult

E) Teenager

94. Was the person who did this drinking alcohol at the time?

A) Yes

B) No

C) Don't know

95. Was the person who did this using drugs at the time?

A) Yes

B) No

C) Don't know

96. Did anyone ever have sex with you when you didn't want them to or sexually force themselves on you in some other way?

A) Yes

B) No

If NO, go to question 102.

97. How many times did this happen to you?

A) 1 to 2 times

B) 3 to 5 times

C) 6 to 10 times

D) More than 10 times

98. When did this happen?

Please mark all that apply.

A) Before grade school

B) In grades 1 to 5

C) In grades 6 to 8

D) In high school

E) Is happening now

99. Who did this to you?

Please mark all that apply.

A) Female

B) Male

C) Family member

D) Adult

E) Teenager

100. Was the person who did this drinking alcohol at the time?

A) Yes

B) No

C) Don't know

101. Was the person who did this using drugs at the time?

A) Yes

B) No

C) Don't know

102. Did anyone ever make you see magazines, pictures, videos, Internet sites, etc., that had to do with sex when you did not want to see it?

A) Yes

B) No

If NO, go to the NEXT PAGE.

103. How many times did this happen to you?

A) 1 to 2 times

B) 3 to 5 times

C) 6 to 10 times

D) More than 10 times

104. When did this happen?

Please mark all that apply.

A) Before grade school

B) In grades 1 to 5

C) In grades 6 to 8

D) In high school

E) Is happening now

105. Who did this to you?

Please mark all that apply.

A) Female

B) Male

C) Family member

D) Adult

E) Teenager

106. Was the person who did this drinking alcohol at the time?

A) Yes

B) No

C) Don't know

107. Was the person who did this using drugs at the time?

A) Yes

B) No

C) Don't know

APPENDIX C

Child Post-traumatic Stress Symptom Scale

This questionnaire asks about the most distressing (traumatic) thing that might have happened to you. It will ask questions about your thoughts, feelings, and bodily sensations in relation to that event. All your answers will be kept strictly anonymous. All your answers are private. No one will ever be able to how you have answered on this form. If you need help or would like to talk to someone about any of these experiences please let us know so that we can put you in touch with the guidance department at your school. You will also be provided with a list of phone numbers and contact information to help you make contact with various trusted and helpful professionals.

Please write down your **most** distressing event:

_____

Did the event happen to you (were you the victim), or did you see it happen to someone else (someone else was the victim)?

_____

_____

_____

Length of time since the event, or date of the event:

_____

_____

Below is a list of problems that youth sometimes have after experiencing an upsetting event. Read each one carefully and on the **blue bubble sheet**, fill out the letter (A, B, C, or D) that best describes how often that problem has bothered you IN THE LAST 2 WEEKS.

	A	B	C	D	
	Not at all or only at one time	Once a week or less/ once in a while	2 to 4 times a week/ half the time	5 or more times a week/almost always	
102.	A	B	C	D	Having upsetting thoughts or images about the event that came into your head when you didn't want them to
103.	A	B	C	D	Having bad dreams or nightmares
104.	A	B	C	D	Acting or feeling as if the event was happening again (hearing something or seeing a picture about it and feeling as if I am there again)
105.	A	B	C	D	Feeling upset when you think about it or hear about the event (for example, feeling scared, angry, sad, guilty, etc)
106.	A	B	C	D	Having feelings in your body when you think about or hear about the event (for example, breaking out into a sweat, heart beating fast)
107.	A	B	C	D	Trying not to think about, talk about, or have feelings about the event
108.	A	B	C	D	Trying to avoid activities, people, or places that remind you of the traumatic event
109.	A	B	C	D	Not being able to remember an important part of the upsetting event
110.	A	B	C	D	Having much less interest in doing things you used to do
111.	A	B	C	D	Not feeling close to people around you
112.	A	B	C	D	Not being able to have strong feelings (for example, being unable to cry or unable to feel happy)
113.	A	B	C	D	Feeling as if your future plans or hopes will not come true (for example, you will not have a job or getting married or having kids)
114.	A	B	C	D	Having trouble falling or staying asleep
115.	A	B	C	D	Feeling irritable or having fits of anger

116.	A	B	C	D	Having trouble concentrating (for example, losing track of a story on the television, forgetting what you read, not paying attention in class)
117.	A	B	C	D	Being overly careful (for example, checking to see who is around you and what is around you)
118.	A	B	C	D	Being jumpy or easily startled (for example, when someone walks up behind you)

APPENDIX D

Centre of Epidemiological Studies Depression Scale

Below is a list of some of the ways you may have felt or behaved. Please indicate how often you have felt this way during the **past week** by recording your answer (A, B, C, or D) on the **blue bubble sheet**.

USE THE FOLLOWING RESPONSE ITEMS:
A. Rarely or none of the time (Less than 1 day)
B. Some or a Little of the Time (1-2 days)
C. Occasionally or a Moderate Amount of the Time (3-4 days)
D. Most or All of the Time (5-7 days)

119. I was bothered by things that usually don't bother me.
A. B. C. D.
120. I did not feel like eating; my appetite was poor.
A. B. C. D.
121. I felt that I could not shake off the blues even with help from my family or friends.
A. B. C. D.
122. I felt that I was just as good as other people.
A. B. C. D.
123. I had trouble keeping my mind on what I was doing.
A. B. C. D.
124. I felt depressed.
A. B. C. D.
125. I felt that everything I did was an effort.
A. B. C. D.
126. I felt hopeful about the future.
A. B. C. D.
127. I thought my life had been a failure.
A. B. C. D.
128. I felt fearful.
A. B. C. D.
129. My sleep was restless.
A. B. C. D.

CESD (Continued)

Below is a list of some of the ways you may have felt or behaved. Please indicate how often you have felt this way during the **past week** by recording your answer (A, B, C, or D) on the **blue bubble sheet**.

USE THE FOLLOWING RESPONSE ITEMS:
A. Rarely or none of the time (Less than 1 day)
B. Some of a Little of the Time (1-2 days)
C. Occasionally or a Moderate Amount of the Time (3-4 days)
D. Most or All of the Time (5-7 days)

130. I was happy.
A. B. C. D.
131. I talked less than usual.
A. B. C. D.
132. I felt lonely.
A. B. C. D.
133. People were unfriendly.
A. B. C. D.
134. I enjoyed life.
A. B. C. D.
135. I had crying spells.
A. B. C. D.
136. I felt sad.
A. B. C. D.
137. I felt that people disliked me.
A. B. C. D.
138. I could not get "going."
A. B. C. D.

APPENDIX E

Rutgers Alcohol Problem Index

Directions: Different things happen to people when they are drinking ALCOHOL, or as a result of their ALCOHOL use. Some of these things are listed below. Please indicate how many times each has happened to you during the last 4 months while you were drinking alcohol or as the result of your alcohol use. When marking your answers, please blacken the appropriate circle for each question, using the following code:

Please select your responses for this questionnaire from the choices below:
A = never
B = 1-2 times
C = 3-4 times
D = 5-6 times
E = more than 6 times

How many times did the following things happen to you while you were drinking alcohol or because of your alcohol use during the last 4 months?

139. Not able to do your homework or study for a test
140. Got into fights, acted bad, or did mean things
141. Missed out in other things because you spent too much money on alcohol
142. Went to work or school high or drunk
143. Caused shame or embarrassment to someone
144. Neglected your responsibilities
145. Relatives avoided you
146. Felt that you needed more alcohol than you used to use in order to get the same effect
147. Tried to control your drinking by trying to drink only at certain times of day or certain places
148. Had withdrawal symptoms, that is, felt sick because you stopped or cut down on drinking
149. Noticed a change in you personality
150. Felt that you had a problem with school
151. Missed a day (or part of a day) of school or work
152. Tried to cut down on drinking
153. Suddenly found yourself in a place that you could not remember getting to
154. Passed out or fainted suddenly
155. Had a fight, argument, or bad feelings with a friend
156. Had a fight, argument or bad feelings with a family member

157. Kept drinking when you promised yourself not to

158. Felt you were going crazy

159. Had a bad time

160. Felt physically dependent on alcohol.

161. Was told by a friend or neighbour to stop or cut down drinking.

APPENDIX F

Differences between EV and No EV on Measures of Depressive Symptoms, PTS Symptom Clusters, and Alcohol Misuse

When the sample was split between those who reported any exposure to violence (EV; either physical, sexual, or both) and those who did not report abuse, an independent t test demonstrated that those who reported no EV (n = 79, CES-D M = 21.0, SD = 10.6) showed a trend towards having significantly higher CES-D scores t (129) = 1.9, p = 0.06 than those who did not report abuse (n = 52, M = 17.4, SD = 10.4). With respect to the four PTS symptoms, when comparing those with EV (n = 85) vs. without EV (n = 55) there were differences in hyperarousal (M = 6.0, SD = 3.6 vs. M = 4.1, SD = 3.2; t (138) = 3.2, $p < .01$), reexperiencing (M = 3.1, SD = 2.9 v. M = 3.0, SD = 2.1; t (138) = 2.4, $p < .05$), avoidance (M = 2.2, SD = 2.1 v. M = 1.0, SD = 1.4; t (138) = 3.7, $p < .001$), and numbing (M = 2.9, SD = 2.8 v. M = 1.8, SD = 1.9; t (138) = 2.5, $p < .05$). And finally, there was also a difference between youth who reported EV (n = 78) and those who reported no EV (n = 57) on the RAPI (M = 18.2, SD = 22.3 v. M = 9.4, SD = 16.7; F (130) = 2.5, $p < 0.05$). Please note that the n's vary across comparisons because not all participants completed all study measures.

APPENDIX G

Child and Youth Resilience Measure

Directions:
Listed below are a number of questions about you, your family, your community, and your relationships with people. These questions are designed to better understand how you cope with daily life and what role the people around you play in how you deal with daily challenges.

Please complete the questions on the answer sheet (the blue bubble sheet)
For each question please chose from one of the following:

Not at All	A Little	Some-what	Quite a Bit	A Lot
A	B	C	D	E

To what extent …
1. Do you have people you look up to?
2. Do you cooperate with people around you?
3. Is getting an education important to you?
4. Do you know how to behave in different social situations?
5. Do you feel that your parent(s) watch you closely?
6. Do you feel that your parent(s) know a lot about you?
7. Do you eat enough most days?
8. Do you strive to finish what you start?
9. Are spiritual beliefs a source of strength for you?
10. Are you proud of your ethnic background?
11. Do people think you are fun to be with?
12. Do you talk to your family about how you feel?
13. Are you able to solve problems without using illegal drugs and/or alcohol?
14. Do you feel supported by your friends?
15. Do you know where to go in your community to get help?
16. Do you feel you belong at your school?
17. Do you think your family, will always stand by you during difficult times?
18. Do you think your friends will always stand by you during difficult times?

19. Are you treated fairly in your community?
20. Do you have opportunities to show others that you are becoming an adult?
21. Are you aware of your own strengths?
22. Do you participate in organized religious activities?
23. Do you think it is important to serve your community?
24. Do you feel safe when you are with your family?
25. Do you have opportunities to develop job skills that will be useful later in life?
26. Do you enjoy your family's traditions?
27. Do you enjoy your community's traditions?
28. Are you proud to be Mi`kmaq?
29. Does your family encourage non-violent solutions to deal with somebody who commits a crime?
30. Does your community encourage non-violent solutions to deal with somebody who commits a crime?

APPENDIX H

Exploratory Principal Component Analysis of the Child and Youth Resilience Measure

Child and Youth Resilience Measure item	Factor 1 Community	Factor 2 Individual	Factor 3 Family
11 People think you're fun to be with?	.76		
19 Treated fairly in community?	.71		-.21
18 Think your friends will always stand by you in difficult times?	.67		.18
15 Know where to go in your community for help?	.67		-.12
24 Feel safe when with family?	.63		.29
16 Feel you belong at your school?	.62	.24	
26 Enjoy your family's traditions?	.58		**.36**
21 Aware of your own strengths?	.55	**.35**	
27 Enjoy community's traditions?	.53		.31
28 Proud to be Mi'kmaq?	.51	.17	
14 Feel supported by your friends?	**.49**		.38
23 Is it important to serve your community?	.48		.18
25 Have opportunities to develop job skills that will be useful later in life?	**.46**	.32	-.13
4 Know how to behave in situations?	-.25	.75	
8 Strive to finish what you start?		.67	
13 Solve problems w/out drugs & alcohol?		.61	
2 Cooperate with people around you?		.55	
20 Have opportunities to show others that you are becoming an adult?	.34	.52	-.16
9 Are spiritual beliefs a source of strength?		.49	.30
3 Is getting an education important to you?		.47	
10 Proud of ethnic background?	.28	.32	.29
*7 Eat enough most days?		.29	.19
5 Feel your parents watch you closely?	-.20	.11	.83
6 Feel your parents know a lot about you?		.15	.67
12 Talk to your family about how you feel?	.25	-.22	.49
17 Think your family will always stand by you in difficult times?	.19	.36	**.38**
1 Have people to look up to?		.29	.32
*22 Participate in organized religious activities?	.22	.15	.28
Number of items in the factor	11	9	6
% of variance accounted for	29.18%	7.10%	6.68%

Notes: Items are sorted by descending factor loadings. Items with a * did not load on any factor and were not used in factor calculations. Underlined entries are the highest loading items. **Bold** faced values indicate that for the purposes of factor score calculation, the cross-loading item contributed to the factor in which it is bolded. Factor loadings of less than .10 were suppressed, and are represented as empty cells.

APPENDIX I

Tables for Moderating Analyses Using Total PTS, PTS Avoidance, PTS Numbing, and PTS Hyperarousal as Dependent Variables

Table I.1.
Moderating Effects of Various Aspects of Resilience on the Relationship between Exposure to Violence and total Posttraumatic Stress Symptoms

Moderation Model	Total Posttraumatic Stress Symptoms					
	F	R^2	*B*	β	*t*	ΔR^2
Model 1. Global Resilience	18.71	.32				
EV			.28	.44	5.22***	
Global Resilience			-.09	-.17	-2.24*	
EV X Global Resilience			-.00	-.12	-1.41	.01
Model 2. Community Resilience	18.79	.32				
EV			.30	.46	5.51***	
Community Resilience			-.21	-.19	-2.47*	
EV X Community Resilience			-.00	-.07	-0.84	.00
Model 3. Family Resilience	16.46	.29				
EV			.30	.46	5.00***	
Family Resilience			-.05	-.03	-0.36	
EV X Family Resilience			-.01	-.12	-1.38	.01
Model 4. Individual Resilience	18.16	.31				
EV			.33	.51	6.78***	
Individual Resilience			-.21	-.16	-2.11*	
EV X Individual Resilience			-.01	-.08	-1.10	.01

Notes: EV = exposure to violence; X = multiplication; SD = standard deviation; *F* = *F* ratio for total model being different from zero; R^2 = variance accounted for by total model; *B* = unstandardized beta coefficient; β = standardized coefficient; *t* = *t* test for coefficients; ΔR^2 = unique variance accounted for by interaction term. *F* values for all 4 models are significant at $p < .001$.
* $p < .05$ **, $p < .01$, *** $p < .001$

Table I.3.
Moderating Effects of Various Aspects of Resilience on the Relationship between Exposure to Violence and the Posttraumatic Stress Symptom of Avoidance

Moderation Model	Posttraumatic Stress Avoidance					
	F	R^2	*B*	β	*t*	ΔR^2
Model 1. Global Resilience	9.56	.19				
EV			.05	.38	4.11***	
Global Resilience			-.01	-.11	-1.34	
EV X Global Resilience			.00	-.05	-0.51	.00
Model 2. Community Resilience	10.78	.21				
EV			.06	.39	4.36***	
Community Resilience			-.04	-.19	-2.25*	
EV X Community Resilience			.00	-.02	0.26	.00
Model 3. Family Resilience	9.36	.19				
EV			.05	.36	3.69***	
Family Resilience			-.00	-.01	-0.11	
EV X Family Resilience			-.00	-.12	-1.24	.01
Model 4. Individual Resilience	8.80	.18				
EV			.06	.42	5.07***	
Individual Resilience			-.01	-.03	-0.38	
EV X Individual Resilience			.00	-.01	-0.16	.00

Notes: EV = exposure to violence; X = multiplication; SD = standard deviation; *F* = *F* ratio for total model being different from zero; R^2 = variance accounted for by total model; *B* = unstandardized beta coefficient; β = standardized coefficient; *t* = *t* test for coefficients; ΔR^2 = unique variance accounted for by interaction term. *F* values for all 4 models are significant at $p < .001$.
* $p < .05$ **, $p < .01$, *** $p < .001$

Table I.3.
Moderating Effects of Various Aspects of Resilience on the Relationship between Exposure to Violence and the Posttraumatic Stress Symptom of Numbing

Moderation Model	Posttraumatic Stress Numbing					
	F	R^2	*B*	β	*t*	ΔR^2
Model 1. Global Resilience	14.39	.26				
EV			.07	.38	4.31***	
Global Resilience			-.03	-.22	-2.74**	
EV X Global Resilience			.00	-.08	-0.93	.01
Model 2. Community Resilience	14.33	.26				
EV			.08	.39	4.57***	
Community Resilience			-.07	-.22	-2.80**	
EV X Community Resilience			.00	-.04	-0.49	.00
Model 3. Family Resilience	11.78	.23				
EV			.07	.38	4.07***	
Family Resilience			-.05	-.09	-1.08	
EV X Family Resilience			-.00	-.09	-0.95	.01
Model 4. Individual Resilience	13.86	.25				
EV			.09	.45	5.67***	
Individual Resilience			-.08	-.20	-2.54*	
EV X Individual Resilience			-.00	-.06	-0.75	.00

Notes: EV = exposure to violence; X = multiplication; SD = standard deviation; *F* = *F* ratio for total model being different from zero; R^2 = variance accounted for by total model; *B* = unstandardized beta coefficient; β = standardized coefficient; *t* = *t* test for coefficients; ΔR^2 = unique variance accounted for by interaction term. *F* values for all 4 models are significant at $p < .001$.
* $p < .05$ **, $p < .01$, *** $p < .001$

Table I.4.
Moderating Effects of Various Aspects of Resilience on the Relationship between Exposure to Violence and the Posttraumatic Stress Symptom of Hyperarousal

Moderation Model	Posttraumatic Stress Hyperarousal					
	F	R^2	*B*	β	*t*	ΔR^2
Model 1. Global Resilience	9.08	.18				
EV			.10	.36	3.92***	
Global Resilience			-.03	-.15	-1.73	
EV X Global Resilience			.00	-.02	-0.25	.00
Model 2. Community Resilience	8.82	.18				
EV			.10	.37	4.07***	
Community Resilience			-.06	-.13	-1.53*	
EV X Community Resilience			.00	-.01	-0.14	.00
Model 3. Family Resilience	7.90	.16				
EV			.11	.39	3.96***	
Family Resilience			-.02	-.02	-0.24	
EV X Family Resilience			.00	-.11	-0.10	.00
Model 4. Individual Resilience	9.86	.20				
EV			.11	.39	4.81***	
Individual Resilience			-.01	-.18	-2.21*	
EV X Individual Resilience			.00	-.02	-0.19	.00

Notes: EV = exposure to violence; X = multiplication; SD = standard deviation; *F* = *F* ratio for total model being different from zero; R^2 = variance accounted for by total model; *B* = unstandardized beta coefficient; β = standardized coefficient; *t* = *t* test for coefficients; ΔR^2 = unique variance accounted for by interaction term. *F* values for all 4 models are significant at $p < .001$.
* $p < .05$ **, $p < .01$, *** $p < .001$

APPENDIX J

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From: Marlyn Bennett, FNCFCS <mbennett.fncfcs@mts.net>

To: Marc Zahradnik <MZAHRADN@dal.ca>

Subject: Re: Atlantic Aboriginal Health Research Program (AAHRP) research collection

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