

1-1-2011

# From Childhood Maltreatment To Depression Behind Bars : Testing A Theoretical Model Of Adolescent Depression Among Juvenile Offenders

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FROM CHILDHOOD MALTREATMENT TO DEPRESSION BEHIND BARS:  
TESTING A THEORETICAL MODEL OF ADOLESCENT DEPRESSION AMONG  
JUVENILE OFFENDERS

by

Sonya G. Wanklyn, B.A., York University, Toronto, Ontario, 2008

A thesis

presented to Ryerson University

in partial fulfillment of the  
requirements for the degree of

Master of Arts

in the Program of

Psychology

Toronto, Ontario, Canada, 2011

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From Childhood Maltreatment to Depression Behind Bars: Testing a Theoretical Model of  
Adolescent Depression Among Juvenile Offenders

Sonya G. Wanklyn

Master of Arts in the Program of Psychology, 2011

Ryerson University

Abstract

Despite research consistently demonstrating a link between childhood maltreatment and depression, our understanding of the potential mediators of this relationship remains limited. Based on the existing literature and corresponding theories, a theoretical model was constructed to assess the effects of childhood maltreatment, impulsivity, hopelessness, and substance use on adolescent offenders' depression severity. This model was tested for sexual abuse, physical abuse, emotional abuse, and emotional neglect using a series of path analyses. Impulsivity and hopelessness partially mediated the effects of childhood sexual abuse and emotional abuse on depression severity, and fully mediated the effects of childhood physical abuse and emotional neglect. Contrary to expectation, substance use did not mediate the relationship between childhood maltreatment and depression severity. These results suggest that childhood maltreatment, impulsivity, and hopelessness may be important variables to include in clinical research related to depression in incarcerated youth.

## Acknowledgements

First, I would like to express gratitude to my supervisor, Dr. David Day, for putting his heart and soul into his role as a mentor. His enthusiasm for teaching has nurtured my curiosity and passion for research, and his dedicated support has guided me through the hostile terrains of a master's thesis. I have grown tremendously as a researcher through the opportunities he has extended to me over the past two years and look forward to working with him in the years to come. It is through Dr. Day that I learned to "immerse myself in my data as a farmer immerses her hands in her soil". Dr. Trevor Hart and Dr. Todd Girard also played a key role in this manuscript. I would like to say thank you to Dr. Hart for his constructive feedback and excellent eye for detail. He has shifted the way I approach writing. I also wish to thank Dr. Girard. My timely completion would not have been possible without his flexibility and statistical guidance through the world of path analysis.

I am deeply grateful for the extended family I have found at Ryerson, and in particular Ashley Ward, Nicole Cormier, Leanne Wilkins, Becca Stein, Jen Rouse, and Amy Brown-Bowers. You have sustained and grounded me along the way with your friendship, levity, and genuineness. It is amazing how powerful and uplifting warm tea, good food, and incredible company can be. Finally, I wish to thank my partner, Matthew Hennebury, for his patience, understanding, and love. When my eyes were tired, you prepared me a cup of tea; when my neck and back ached, you provided me with a massage; and when I was stressed, you never failed to wrap your arms around me and bring me back to a state of calm.

*A thousand hands had nursed this manuscript before the first hypothesis was even conceived. To every person who contributed to the path that led me here, a thousand "Thank You"s.*

## Dedication

I would like to dedicate this thesis to my mother

### ***Virginia Bruhm***

who has always held pride in her heart for me and encouraged me to reach for the stars. *No matter the obstacles life has presented along the way, you have stood strong by my side at the ready with an embrace. Your love has carried me through the rain and I cannot adequately express how much you mean to me.*

In addition to my father

### ***Roy Wanklyn***

who taught me to fight for what I believe in, offer support and compassion to people (and non-human critters) whenever I am able, and cherish every moment spent in the company of those I care for. *Though I continue to miss you every day, the memories you blessed me with have kept me strong. Your laughter and love have stayed with me after all these years. Without you, I would not be me.*

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# **From Childhood Maltreatment to Depression Behind Bars: Testing a Theoretical Model of Adolescent Depression Among Juvenile Offenders**

Youth involved in the juvenile justice system represent one of the largest concentrations of adolescents presenting with mental health problems. In Canada during 2006-2007, this group consisted of 56,463 youth, 17% of whom were given a custodial sentence (Thomas, 2008). Research suggests that as many as 83% of incarcerated youth meet criteria for at least one mental health disorder, with 73% meeting criteria for more than one disorder (Colins, Vermeiren, Schuyten, & Broekaert, 2009). Major depressive disorder and depression symptoms, in particular, are especially prominent among individuals who engage in criminal behaviour (Bergen, Martin, Richardson, Allison, & Roeger, 2004; Gover & MacKenzie, 2003; McReynolds, Schwalbe, & Wasserman, 2010; Teplin, Abram, McClelland, Dulcan, & Mericle, 2002).

Childhood maltreatment is a causal factor in the development of depressive symptoms in the general population, and these symptoms are even more prevalent among incarcerated youth (Singer, Menden, Song, & Junghofer, 1995). Incarcerated youth who experience childhood maltreatment report higher prevalence of depression and severity of depression symptoms, compared to non-maltreated youth (Bender, 2010; Kilpatrick et al., 2003; Turner, Finkelhor, & Ormrod, 2006). Yet, the mental health needs of incarcerated youth remain an understudied area. Although the literature consistently suggests a relationship between childhood maltreatment and depression severity among incarcerated youth, there is a lack of information on the mediators of this relationship.

This thesis aims to test a theoretical model of the relationship between childhood maltreatment and depression severity in a sample of incarcerated youth. Specifically, this study

has five primary goals: (1) to gain a richer understanding of the relationship between depression severity and childhood maltreatment among a sample of Canadian incarcerated youth; (2) to determine if impulsivity, hopelessness, and substance use mediate this relationship; (3) to explore the differential contributions of subtypes of childhood maltreatment on depression severity (namely emotional abuse, physical abuse, sexual abuse, and emotional neglect); (4) to investigate the effects of experiencing multiple types of childhood maltreatment on depression severity, impulsivity, hopelessness, and substance use; and (5) to examine the role of sex differences in understanding relationships among these variables, which has been largely overlooked in previous research.

### **Organization of the Thesis**

This thesis is divided into five main sections. The first section consists of a review of the literature. This review examines the role of depression severity, childhood maltreatment, hopelessness, substance use, and impulsivity in juvenile delinquency, along with a brief overview of the association between childhood maltreatment and depression severity. Furthermore, impulsivity, hopelessness, and substance use are reviewed in terms of their relationships to depression severity and childhood maltreatment. The second section details the study goals and hypotheses. The third section describes the sample, method of investigation, study measures, and data analytic strategy employed. Results of the analyses are provided in the fourth section, while the fifth section discusses the findings with respect to the broader literature. In addition, this section documents the limitations and implications of the study, and directions for research.

## **Two Important Correlates of Criminal Behaviour**

Childhood maltreatment is widely recognized as a risk factor for involvement in criminal activity, whereby a history of emotional or physical neglect, or physical, sexual, or emotional abuse, have been reported to increase the likelihood of antisocial and delinquent behaviour (Malinosky-Rummell & Hansen, 1993; National Research Council, 1993; Ryan & Testa, 2004; Scudder, Blount, Heide, & Silverman, 1993; Swanston et al., 2003; Verrecchia, Fetzer, Lemmon, & Austin, 2010). In fact, the association between childhood maltreatment and later offending is so well established that some authors have expressed concern about this link being misused in court as evidence for more punitive correctional measures on the grounds that the perpetrator is at a higher risk to reoffend than his or her nonvictimized counterparts (Grisso, 2002; Stevenson, 2009). Without intervention, these maltreated youth are more likely to commit a violent offence (Widom, 1992), have an earlier onset for the initiation of delinquent behaviours (Rivera & Widom, 1990), and are at a higher risk for criminal recidivism and for involvement in the adult criminal justice system (Visher, Lattimore, & Linster, 1991). Furthermore, this effect is cumulative; youth are at increased risk for delinquency when multiple forms of maltreatment are experienced (Crooks, Scott, Wolfe, Chiodo, & Killip, 2007; Cuevas, Finkelhor, Ormrod & Turner, 2009; Ford, Elhai, Connor, & Frueh, 2010), and those who are repeatedly abused are more likely to re-offend (Chang, Chen, & Brownson, 2003).

Youth also present to the juvenile justice system with a high prevalence of depression symptoms, with research suggesting over 50% of incarcerated youth have moderate or severe depression (Domalanta, Risser, Roberts, & Risser, 2003). In a longitudinal investigation of the role of psychopathology in the development of criminal and other high-risk behaviours in youth, depression severity was positively correlated with an increased probability of high-risk



behaviours (Garai, Forehand, Colletti, & Rakow, 2009). Furthermore, depression symptoms have been demonstrated as among the most consistent and strongest predictors of youth violence and aggression, alongside delinquent peer associations, antisocial personality traits, and family conflict (Ferguson, San Miguel, & Hartley, 2009).

### **Childhood Maltreatment as a Risk Factor for Depression**

Childhood maltreatment appears to initiate a cascade of events that have the potential to alter normal development, and evidence continues to accumulate regarding its influence on the development of depression (Brown, Cohen, Johnson, & Smailes, 1999; Finkelhor, 1990; Ratican, 1992; Teicher, Samson, Polcari, & McGreenery, 2006). Furthermore, trauma continues to have a negative prolonged effect on mental health conditions across the lifespan (e.g., King et al., 2002; Shea, Walsh, Macmillan, & Steiner, 2005). The stress sensitization hypothesis posits that individuals become sensitized to events that precipitate depressive episodes. The result of sensitization is that less stress is required for the reoccurrence, than for the onset, of depression (Post, 1992; Post, Rubinow, & Ballenger, 1986). Research with depressed populations has demonstrated support for the stress sensitization hypothesis for both proximal stressful life events (Kendler, Thornton, & Gardner, 2000, 2001), as well as distal stressful events including childhood maltreatment (Dienes, Hammen, Henry, Cohen, & Daley, 2006; Hammen, Henry, & Daley, 2000; Harkness, Bruce, & Lumley, 2006).

Although the relationship between childhood maltreatment and later depression and depression severity has been firmly established in the literature, the role of subtypes of childhood maltreatment as predictors of depression and depression severity remains unclear. For example, childhood sexual and emotional abuse have been reported to have stronger correlations with a diagnosis of depression than childhood physical abuse (Gibb, Butler, & Beck, 2003). When

considering depression severity, childhood physical abuse has been found to be a stronger predictor than childhood sexual abuse (Roosa, Reinholtz, & Angelini, 1999). Researchers have also reported an increased predictive power of childhood emotional abuse and neglect, over childhood sexual or physical abuse, with respect to depression severity (e.g., Powers, Ressler, & Bradley, 2009). In contrast, other studies have found no support for differential effects on depression severity based on type of childhood abuse history (e.g., Arata, Langhinrichsen-Rohling, Bowers, & O'Brien, 2007).

With respect to the impact of experiencing multiple subtypes of childhood maltreatment, research suggests cumulative maltreatment may lead to more detrimental mental health functioning than exposure to only one subtype of childhood maltreatment. For instance, the number of maltreatment subtypes experienced in childhood has been associated with poorer mental health functioning, including increased depression severity, among both men and women (Bagley, 1996; Edwards, Holden, Felitti, & Anda, 2003; Lange et al., 1999). However, relatively few studies have examined the effects of cumulative childhood maltreatment on depression severity and other indicators of mental health functioning.

### **Potential Mediators in the Relationship Between Childhood Maltreatment and Depression**

**Hopelessness.** Hopelessness has been operationalized as an information-processing bias that distorts an individual's subjective experience of external events in the environment (Beck, 1987). Numerous theories have posited a relationship between depression severity and persistent negative expectancies and cognitions. According to Beck's (1967, 1987) cognitive theory of depression, dysfunctional negative cognitions are the primary antecedents of depression symptoms. Beck suggested three overarching themes of negative beliefs (referred to as the cognitive triad) that result in depression: negative thoughts about the self, the world, and the

future. This model has stimulated considerable interest and numerous studies have generated strong support for a relationship between hopelessness and depression severity (e.g., Alloy & Abramson, 1999; Duberstein, Conner, Conwell, & Cox, 2001; Gladstone, Parker, Wilhelm, Mitchell, & Austin, 1999; Hussey, Strom, & Singer, 1992; Moilanen, 1993).

Beck's theory posits that negative events in the formative years can contribute to the development of persistent and maladaptive negative cognitions later on. Furthermore, it has been proposed that repeated stressors might contribute to the strengthening of the negative cognitive schema (Segal, Williams, Teasdale, & Gemar, 1996) and a more depressogenic cognitive style has been demonstrated in children with a history of maltreatment (Garber & Flynn, 2001; Harkness et al., 2006). Nevertheless, few empirical investigations have examined childhood maltreatment history as a potential precursor to hopelessness. Rose and Abramson (1992), hypothesized that childhood maltreatment may lead to hopeless attributions and inferences and the subsequent development of depression. As such, negative cognitive styles (including hopelessness) should mediate the relationship between childhood maltreatment and depression severity in adolescents and adults. Indeed, this relationship has been reported in the literature (e.g., DuRant, Getts, Cadenhead, Emans, & Woods, 1995; Gibb & Coles, 2005). In a sample of children and adolescents, Feiring, Taska, and Lewis (1998) reported a positive relationship between negative cognitive appraisals and the number of sexual abuse events experienced, and these negative cognitions acted as a mediator between the sexual abuse and severity of depression.

**Impulsivity.** Impulsivity embodies a wide range of behaviours characterized by a response to internal or external stimuli without forethought or consideration for potential negative consequences (Moeller, Barratt, Schmitz, & Swann, 2001). This predisposition to

behaviour without reflection has a strong relationship to suicide (e.g., Beck, Brown, Berchick, Stewart, & Steer, 1990). However, the association between impulsivity and depression is not well understood and is infrequently investigated (Swann, Steinberg, Lijffijt, & Moeller, 2008). In a study examining the behavioural correlates of depression severity in methamphetamine users, depressed participants scored higher on measures of impulsivity (Semple, Zians, Strathdee, & Patterson, 2007). Studies of nonsubstance users have demonstrated similar results (Engel et al., 2005; Swann et al., 2008). Moreover, research suggests impulsivity precedes depression (d'Acremont & Van der Linden, 2007).

There is growing evidence that childhood maltreatment influences brain development in children (e.g., Gerra et al., 2007; Lovallo, 1997). Low serotonin function has been associated with impulsive behaviours, which parallels serotonin depletion resulting from chronic or persistent trauma. Reduced availability of serotonin leads to decreased ability of the central nervous system to dampen emotional responses to stressors (Braquehais, Oquendo, Baca-García, & Sher, 2010; De Bellis et al., 1994; Lindstrom et al., 2004). This chronic inability to modulate emotions might also explain the association between impulsivity and depression severity (e.g., Gerra et al., 2007). In an investigation of the relationship of childhood abuse to impulsivity and suicidal behaviour, depressed individuals who reported an abuse history had significantly higher impulsivity scores than non-abused individuals (Brodsky et al., 2001). From this, Brodsky and colleagues (2001) suggested that early experiences of abuse might constitute an environmental risk factor for the development of impulsivity. Although impulsivity has been considered a risk factor for exposure to trauma, impulsivity is principally considered the consequence of trauma experienced in childhood or adolescence (Braquehais et al., 2010).

**Substance use.** The association between substance use and depression severity is well established, with many studies reporting a greater level of depression severity in drug users than non-drug users (e.g., De Win et al., 2004; Falck, Wang, Carlson, Eddy, & Siegal, 2002; Sumnall & Cole, 2005). However, whether substance use typically results from attempts to ameliorate negative affect or substance use leads to depression symptomatology is currently unknown, based on mixed research results in this area of study (Davidson, 1995; Hartka et al., 1991; Hasin & Grant, 2002; Kuo, Gardner, Kendler, & Prescott, 2006; Swendsen & Merikangas, 2000; VanZile-Tamsen, Testa, Harlow, & Livingston, 2006; Wang & Patten, 2001, 2002). Several studies have reported substance use to be a strong predictor of depression (e.g., Swanson, Linskey, Quinero-Salinas, Pumariega, & Holzer, 1992).

The positive association between childhood maltreatment and substance use has been recorded across diverse samples, including incarcerated adolescents (Hawke, Jainchill, & DeLeon, 2000; Rowe, Wang, Greenbaum, & Liddle, 2008; Steel & Herlitz, 2005). A variety of studies has suggested that childhood maltreatment, and other negative events occurring during childhood, increase the risk for substance use disorders and misuse (Gerra et al., 2007; Wonderlich et al., 2001). Supporting this, several authors have reported an association between substance use and being a victim of both sexual and non-sexual violence (e.g., Anda et al., 2002; Lipschitz, Grilo, Fehon, McGlashan, & Southwick, 2000).

### **Impulsivity and Hopelessness as Risk Factors for Substance Use**

Recent theoretical models have identified impulsivity as a vulnerability factor for substance use (e.g., Wills & Stoolmiller, 2002). Increased impulsivity has been identified as a causal factor in the escalation of substance use as well as the acquisition of substance use disorders (Perry & Carroll, 2008). Alternatively, impulsivity has been identified as a

consequence of prolonged substance use (Sher et al., 2007). However, Conrod, Pihl, Stewart, and Dongier (2000) advocated for the notion that impulsivity is present before substance use. This was suggested because conduct problems across their sample preceded substance use disorder by an average of seven years.

Hopelessness has also been identified as an important determinant of substance use behaviours (Bolland, 2003; Bolland et al., 2007; Metha, Chen, Mulvenon, & Dode, 1998). For example, in an examination of the role of substance use in adolescents who had attempted to commit suicide, alcohol abuse was significantly related to both hopelessness and depression in male psychiatric patients (Overholser, Freiheit, & DiFilippo, 1997).

### **Sex Differences in Depression Severity and Childhood Maltreatment**

Research regarding sex differences with respect to the association between childhood maltreatment and depression severity has yielded mixed results, with no definitive pattern of differences emerging. Several studies have suggested that childhood sexual abuse may have a more profound effect on depression symptoms among boys (Garnefski & Diekstra, 1997; Schraedley, Gotlib, & Hayward, 1999). Other investigations report greater depression severity among females with history of child abuse (e.g., Powers et al., 2009), with studies overall suggesting childhood maltreatment results in more internalizing behaviours in girls and greater externalizing behaviours in boys (Bergen et al., 2004; Grilo, Becker, Fehon, Edell, & McGlashan, 1996; Wolfe, Scott, Wekerle, & Pittman, 2001). In contrast, Arata and colleagues (2007) did not observe any sex differences when looking at the effects of maltreatment in a large sample of adolescents.

There are, however, consistent findings in the literature to suggest that females have a greater severity of depression (Cauffman, 2004; Waller et al., 2006; Wiesner & Windle, 2006),

as well as higher rates of childhood maltreatment (McClellan, Farabee, & Crouch, 1997; Miller, Trapani, Fejes-Mendoza, Eggleston, & Dwiggins, 1995; Moffitt, Caspi, Rutter, & Silva, 2001). In addition, there is some indication that males experience an increased severity of hopelessness (Bolland, 2003) and history of physical abuse (Gibb et al., 2001).

## **The Present Study**

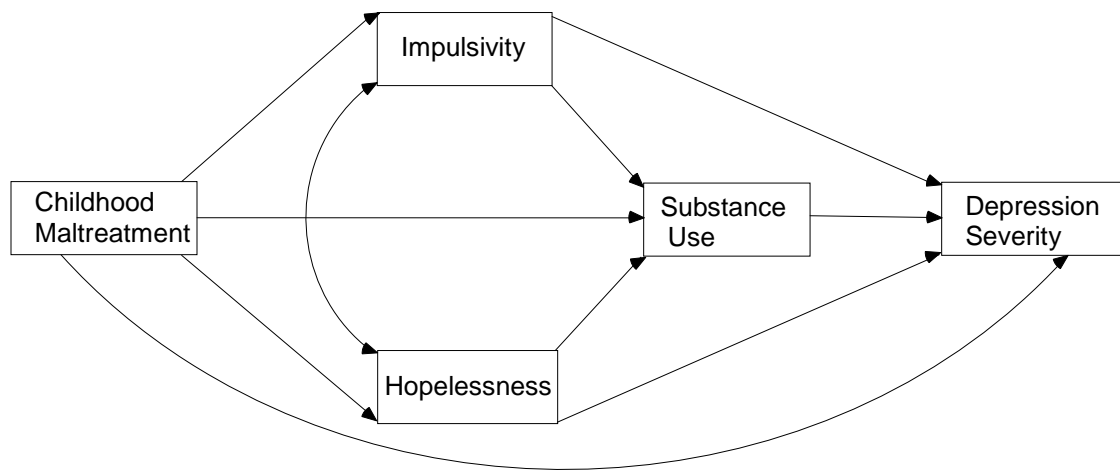
Theorists have long believed that depression severity in adolescence and adulthood is precipitated by childhood maltreatment (e.g., Bowlby, 1980). However, the potential pathways linking these variables are not well understood. Furthermore, few studies have investigated samples of incarcerated persons and, in particular, juvenile offenders. Given the connection between depressive symptomatology, childhood victimization, and criminal offending, this population is ideal for such an investigation. Thus, the primary purpose of this study was to expand on the body of knowledge concerning the association between childhood maltreatment exposure and depression severity among justice-involved youth. Specifically, this study tested a theoretical model of the relationship between childhood maltreatment subtypes and depression severity, by exploring impulsivity, hopelessness, and substance use as mediators. Sex differences and the effects of experiencing multiple subtypes of childhood maltreatment also were investigated.

### **Anticipated Outcomes**

**The path model.** Based on the existing literature and corresponding theories, a causal model was constructed to assess the effects of childhood maltreatment, impulsivity, hopelessness, and substance use on adolescents' depression severity (see Figure 1). Each subtype of childhood maltreatment was assessed individually within this model. It was hypothesized that:

1. Childhood maltreatment (all subtypes) would be positively related to impulsivity, hopelessness, substance use, and depression severity;
2. Impulsivity, hopelessness, and substance use would be positively related to depression severity;
3. Impulsivity and hopelessness would be positively related to substance use;





*Figure 1.* Hypothesized model of childhood maltreatment, impulsivity, hopelessness, and substance use in relation to depression severity.

4. Childhood maltreatment (all subtypes) would have a direct effect on depression severity;
5. Impulsivity, hopelessness, and substance use would have a direct effect on depression severity;
6. Impulsivity and hopelessness would have a direct effect on substance use;
7. Childhood maltreatment (all subtypes) would have an indirect effect on depression severity through impulsivity, hopelessness, and substance use;
8. Impulsivity and hopelessness would have an indirect effect on depression severity through substance use.

**Cumulative childhood maltreatment.** In addition to the path model, the following relationship among path variables was hypothesized:

9. The cumulative effects of multiple categories of childhood maltreatment would be associated with increased impulsivity, hopelessness, substance use, and depression severity.

## Method

### Sample

The sample for this cross-sectional study comprised 116 juvenile offenders (70 males, 46 females) recruited from open and secure custody facilities in the Greater Toronto Area. Data collection took place over a 14-month period from July 2009 through August 2010. Eligibility criteria for the study consisted of being: (a) between the ages of 12 to 24 years; (b) fluent in English; and (c) in custody at a youth justice facility under the supervision of the Ministry of Children and Youth Services (MCYS) at the time of the interview. Youth were excluded if they had an active psychotic disorder that interfered with functioning or were actively suicidal, and facility staff provided this information. Due to incomplete data from 6 youth across the measures, all analyses for this study included a sample of  $n = 110$  (67 males, 43 females).

The average age of participants at the time of the interview was 16.78 years ( $SD = 1.07$ ). Eighty-nine youth (80.9%) had completed at least one year of high school, and the sample was diverse in terms of their ethnicity and self-identified religion (see Table 1). With respect to the index offence (the offence committed that led to his/her incarceration) relating to participants' current incarceration, 68.2% of the youth ( $n = 75$ ) reported being charged or convicted of a violent offence, 35.5% ( $n = 39$ ) endorsed being charged or convicted of a property offence, and 16.4% ( $n = 18$ ) reported a charge or conviction for a drug offence. The percentage of youth reporting violent, property, and drug charges or convictions increased by approximately 22% to 30% when considering lifetime charges or convictions, and exactly half the sample reported being in custody at a youth justice facility in the past (see Table 2). The majority of the youth (60.0%) were sentenced to serve time at the facility for their most recent offences, whereas the remainder was incarcerated for the purpose of detention (e.g., awaiting sentencing).

Table 1

*Demographics of the Sample*

Variable	Males	Females	Total sample			
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)			
Sexual orientation						
Heterosexual	66 (98.5)	26 (60.5)	92 (83.6)			
Bisexual	-	17 (39.5)	17 (15.5)			
Highest completed level of education						
≤ Grade 8	6 (9.0)	15 (34.9)	21 (19.1)			
Grade 9	14 (20.9)	8 (18.6)	22 (20.0)			
Grade 10	19 (28.4)	11 (25.6)	30 (27.3)			
Grade 11	20 (29.9)	8 (18.6)	28 (25.5)			
Grade 12	6 (9.0)	-	6 (5.5)			
≥ First year college/ university	2 (3.0)	1 (2.3)	3 (2.7)			
Religion						
Catholic	9 (13.4)	8 (18.6)	17 (15.5)			
Christian	28 (41.8)	10 (23.3)	38 (34.5)			
Islamic	7 (10.4)	4 (9.3)	11 (10.0)			
None	16 (23.9)	15 (34.9)	31 (28.2)			
Other	7 (10.4)	6 (14.0)	13 (11.8)			
Ethnicity						
African/Caribbean	50 (74.6)	11 (25.6)	61 (55.5)			
Aboriginal	1 (1.5)	8 (18.6)	9 (8.2)			
White	8 (11.9)	26 (60.5)	34 (30.9)			
Other	12 (17.9)	14 (32.6)	26 (23.6)			
	<i>M</i> ( <i>SD</i> )	Range	<i>M</i> ( <i>SD</i> )	Range	<i>M</i> ( <i>SD</i> )	Range
Age (years)	17.10 (1.08)	15-20	16.28 (0.85)	14-18	16.78 (1.07)	14-20

*Note.* The variation in sample size in sexual orientation is due to missing data for one male participant. Percentages add up to more than 100% for ethnicity because some youth identified more than one ethnicity.

Table 2

*Offending Characteristics of the Sample*

Variable	Males <i>n</i> (%)	Females <i>n</i> (%)	Total sample <i>n</i> (%)
Current charges or convictions			
Property	19 (28.4)	20 (46.5)	39 (35.5)
Violent	55 (82.1)	20 (46.5)	75 (68.2)
Drug	15 (22.4)	3 (7.0)	18 (16.4)
Other	16 (23.9)	30 (69.8)	46 (41.8)
Previous charges or convictions			
Property	27 (40.3)	30 (69.8)	57 (51.8)
Violent	45 (67.2)	32 (74.4)	77 (70.0)
Drug	20 (29.9)	6 (14.0)	26 (23.6)
Other	27 (40.3)	26 (60.5)	53 (48.2)
Lifetime charges or convictions			
Property	35 (52.2)	35 (81.4)	70 (63.6)
Violent	62 (92.5)	38 (88.4)	100 (90.9)
Drug	26 (38.8)	9 (20.9)	35 (31.8)
Other	35 (52.2)	36 (83.7)	71 (64.5)
Previously incarcerated	38 (56.7)	17 (39.5)	55 (50.0)
Reason for incarceration			
Sentenced to serve time	43 (64.2)	23 (53.5)	66 (60.0)
Detention	24 (35.8)	20 (46.5)	44 (40.0)

*Note.* Percentages add up to more than 100% because some youth identified more than one charge or conviction.

## **Recruitment and Data Collection Procedure**

Six youth custody facilities (5 open, 1 secure) were included in the study. Flyers describing the study (see Appendix A) were posted at each facility in a visible area accessible to the youth, directing interested youth to an on-site contact person. This contact person was a unit or facility manager not involved in the provision of clinical services. In this regard, a facility manager served as a liaison between the study coordinator and participants in order to minimize the involvement and knowledge of other staff regarding participation, to respect the privacy of youth's identities, and to minimize any perceived pressure to participate.

When youth 16 years of age and older expressed an interest in participating in the study, the on-site contact person contacted the research coordinator to schedule a time to meet the youth. In-person and prior to testing, a formal consent protocol was read to youth by the research coordinator (see Appendix B). During this process, participants were encouraged to ask questions as the research coordinator described the purpose of the study, limits of confidentiality, processes in place to maintain anonymity, and potential for discomfort in reading and responding to some of the questionnaire items. Youth were also informed that they could stop at any time if they chose without penalty, and that participation in the study would in no way affect their involvement in any treatment programs at the facility or the services received. For youth under the age of 16 years, the on-site contact person obtained consent from a parent, guardian, or the youth's social worker (in the case of the youth being a crown ward) before a meeting was scheduled with the research coordinator (see Appendix C). Once parental consent was received, these youth were read an assent form containing the same information as the consent form for youth 16 years of age and older (see Appendix D). Participants who remained interested signed the assent/consent forms before being administered the questionnaire package. Two youth who

expressed an interest in participating in the study to their facility manager declined to participate once the research coordinator arrived to read over the consent form.

The research coordinator tested youth individually within a quiet room of the facility. During this time, youth completed a series of questionnaires and were encouraged to ask for clarification or assistance throughout. Youth were also given the option to have the study coordinator read the questionnaire items to them. For the majority of the interviews, the youth opted to complete the questionnaire on their own in the presence of the coordinator. Fifteen youth chose to have the questionnaire items read to them. No differences on variables of interest for this study were identified between participants who read the questionnaire and those who had the questionnaires read to them (see Table 3). At the end of the session, youth received \$15.00 as reimbursement for their time. This amount has been used in previous studies with juvenile offenders over a one-hour period (e.g., Robbins & Bryan, 2004). In facilities that permitted it, participants were offered a snack (pop and potato chips) during the testing session. Approval for this study was obtained from the Research Ethics Boards at Ryerson University and York University, as well as the Ministry of Community Safety and Correctional Services/MCYS Youth Justice Research Committee (see Appendices E, F, and G, respectively).

## **Measures**

**Demographics.** Demographic information was collected from participants, including age, sex, sexual orientation, education, religion, and ethnic background. Offending information included current and past criminal charges or convictions, whether they were serving a custody sentence or in detention, and if this was their first time in custody (see Appendix H).

**Childhood maltreatment.** The Childhood Trauma Questionnaire - Short Form (CTQ-SF; Bernstein & Fink, 1998; Bernstein et al., 2003) is a 28-item self-report retrospective

Table 3

*Mann-Whitney U-tests and Independent t-tests for Group Differences Between Youth Who Read the Questionnaire Materials and Youth Who Opted to Have the Questions Read to Them by the Research Coordinator*

Variable	<i>Mdn</i>		<i>U</i>	<i>z</i>	<i>p</i>	<i>n</i>
	Self	RC				
Hopelessness	4.00	3.00	710.00	-0.02	.983	110
Substance use	7.00	7.00	686.50	-0.23	.817	110
Physical abuse	8.00	10.00	602.50	-0.98	.326	110
Sexual abuse	5.00	5.00	684.50	-0.30	.763	110
Emotional abuse	8.00	7.00	672.00	-0.36	.723	110
Depression	21.00	16.00	627.00	-0.75	.456	110
	<i>M</i>		<i>t</i>	<i>SE</i>	<i>p</i>	df
	Self	RC				
Impulsivity	70.04	64.38	1.15	4.94	.269	108
Emotional neglect	11.54	9.93	1.04	1.54	.300	108

*Note.* Self refers to youth who completed the questionnaire themselves. RC refers to youth who choose to have the questionnaire read to them by the research coordinator.



inventory assessing childhood experiences of maltreatment. Respondents rate the frequency of a particular incident on a 5-point Likert scale ranging from *never true* (1) to *very often true* (5). The central constructs underlying the inventory are emotional neglect and abuse, physical neglect and abuse, and sexual abuse. These subscales each contain five items that begin with the stem "When I was growing up", and items are summed to yield a total subscale score, with higher scores indicating greater severity of childhood maltreatment. Typical items include "when I was growing up people in my family hit me so hard that it left bruises or marks" (physical abuse) and "when I was growing up people in my family said hurtful or insulting things to me" (emotional abuse). Three additional items comprise the minimization/denial subscale designed to check for extreme response bias. These items are dichotomized, with *never* = 0 and all other responses scored as 1, with a total score greater than 0 indicating "the possible underreporting of maltreatment (false negatives)" (Bernstein & Fink, 1998, pp. 18). The CTQ-SF has been well validated with both adolescent and adult populations and there is good support for the convergent and discriminant validity of the measure (Bernstein & Fink, 1998; Bernstein et al., 2003). Internal consistency coefficients for subscales have been reported to be excellent, with Cronbach's alphas ranging from .81 to .95 (Bernstein et al., 2003).

For the purposes of this study, four subscales were used to investigate childhood maltreatment: sexual abuse, physical abuse, emotional abuse, and emotional neglect. Physical neglect was not used because research has demonstrated this scale to be unstable (Villano et al., 2004) and to have poor reliability (Hodson, Newcomb, Locke, & Goodyear, 2006; Paivio & Cramer, 2004). Emotional neglect referred to "the failure of caretakers to meet children's basic emotional and psychological needs, including love, belonging, nurturance, and support". Emotional abuse was defined as "verbal assaults on a child's sense of worth or well-being of any

humiliating or demeaning behavior directed toward a child by an adult or older person". Physical abuse was defined as "bodily assaults on a child by an adult or older person that posed a risk of or resulted in injury". Sexual abuse referred to "sexual contact or conduct between a child younger than 18 years of age and an adult or older person" (Bernstein et al., 2003, pp. 175). Internal consistency for the subscales employed in this study were excellent, with reliability coefficients (Cronbach's  $\alpha$ ) of .96 (sexual abuse), .88 (physical abuse), .91 (emotional abuse), and .90 (emotional neglect). These subscales were used in two ways. In order to test the proposed theoretical models, subscales were used independently as quantitative ratings of childhood maltreatment type, with higher scores indicating greater severity of maltreatment. To investigate the effects of cumulative childhood maltreatment, subscales were dichotomized (indicative of childhood maltreatment having occurred or not) and summed.

**Hopelessness.** Severity of hopelessness was measured with the Beck Hopelessness Scale (BHS; Beck, Weissman, Lester, & Trexler, 1974). This is a self-report measure consisting of 20 true-false statements designed to assess the extent of negative and positive expectations about the future. Individuals completing this instrument are asked to answer the items based on their attitudes during the preceding week. Each statement is scored as a 0 or 1 and a total score is calculated by summing pessimistic responses for each of the 20 items, with higher scores indicating a greater degree of hopelessness about the future. The instrument has high internal reliability across diverse clinical and nonclinical populations (Cronbach's alphas from .87 to .93), and test-retest reliability correlations of between .69 and .85 have been reported (e.g., Holden & Fecken, 1988). The concurrent validity has been well established across a variety of samples and the predictive validity of the BHS has been supported in several studies (e.g., Chapman, Specht, & Cellucci, 2005). Cronbach's  $\alpha$  for the BHS in this study was .79.

**Impulsivity.** The Barratt Impulsiveness Scale, Version 11 (BIS-11; Patton, Stanford, & Barratt, 1995) is a widely-used, 30-item self-report questionnaire. This measure is designed to assess impulsivity as a stable characteristic, taking into consideration the multi-faceted nature of the construct. The instrument allows for the assessment of three factors consisting of attentional impulsivity, motor impulsiveness, and nonplanning impulsiveness. Questionnaire items are scored on a scale from 1 to 4 (*rarely/never, occasionally, often, almost always/always*), with a total score obtained by summing all items. The total score was used for this study. The BIS is the most frequently applied psychometric measure of impulsivity (Spinella, 2007) and has been used across a range of contexts and samples (e.g., von Diemen, Szobot, Kessler, & Pechansky, 2007). Internal consistency scores for the total scale were reported by the authors as within acceptable limits for the use in applied studies (Cronbach's alphas from .79 to .83; Patton et al., 1995). Reliability for the BIS-11 in this study was good (Cronbach's  $\alpha = .86$ ).

**Substance use.** Substance use was measured using drug-related questions from the Ontario Student Drug Use and Health Survey (OSDUHS), developed by the Centre for Addiction and Mental Health (CAMH, 2009). The OSDUHS is a widely-used measure by health, educational, and government officials, and samples over 20 substances in addition to cannabis, alcohol, and tobacco based on 12 month prevalence. This self-report survey has been administered across Ontario every two years since 1977, to over 150 elementary and secondary schools, by employing a regionally-stratified design.

For the purposes of this study, a scale was created to measure substance use by summing responses to 16 questions pertaining to frequency of use across a variety of drugs, such as cannabis, heroin, cocaine, and methamphetamine (see Appendix I). Response options ranged from *never used* (0) to *40 or more times* (7), with an option *don't know what (name of drug) is*.

Consistent with CAMH documentation (Paglia-Boak, Mann, Adlaf, & Rehm, 2009), participants who indicated that they did not know what the drug was were considered nonusers and their data were retained for analyses. Though no psychometric data for the OSDUHS could be found, the 16-item substance use scale created for this study had good reliability (Cronbach's  $\alpha = .82$ ).

**Depression severity.** Depression severity was measured with the Center for Epidemiological Studies Depression Scale for Children (CES-DC; Faulstich, Carey, Ruggiero, Enyart, & Gresham, 1986). This is a 20-item self-report depression inventory on a 4-point scale from 0 (*not at all*) to 3 (*a lot*). Respondents are asked to indicate how frequently over the past week they have experienced a variety of symptoms of depression. Higher CES-DC scores are indicative of increasing depression severity, with scores over 15 suggesting significant levels of depression as defined by the instrument authors. Test-retest reliability, internal consistency, and concurrent validity were shown to be adequate, with good psychometric properties for adolescents (Faulstich et al., 1986). The reliability coefficient for the CES-DC in this sample was excellent (Cronbach's  $\alpha = .91$ ).

### **Data Analytic Strategy**

**The path model.** Relationships between childhood maltreatment, impulsivity, hopelessness, substance use, and depression severity were examined using observed variable path analyses, thus addressing the first eight hypotheses. This was done in AMOS 18.0 (Arbuckle, 2009) with the maximum likelihood (ML) method of estimation. Each subtype of childhood maltreatment (sexual abuse, physical abuse, emotional abuse, and emotional neglect) was examined in a separate model. Path analysis is a specialized type of structural equation modeling (SEM) with single indicators for each construct. The term SEM conveys two related aspects of the multivariate procedure. First, this form of analysis implies causation among

variables and these relationships are represented by a series of structural equations (i.e., regressions). Second, a clearer conceptualization of the structural relations (or path relations) under study can be modeled pictorially (Byrne, 2010). Path analyses allow for the testing of causal pathways between variables by allowing them to act as both independent (exogenous) and dependent (endogenous) variables, where the direct and indirect effects for each endogenous variable within the models are considered. This is achieved through the simultaneous analysis of the entire system of variables to determine if the model is consistent with the data (Byrne, 2010). In this study, the only sole exogenous variables were the childhood maltreatment subtypes, while the only sole endogenous variable was depression severity.

Path analysis provides both an estimation of the magnitude of the relationships between variables and a test of fit for the proposed model. A model-trimming approach was used by testing fit difference for nested models. As is typical in model trimming, analyses were first performed on the just-identified model (Kline, 2005). This was done to eliminate parameters by identifying nonsignificant paths, followed by constraining one of these freely estimated paths to equal zero. The nonsignificant path with the lowest standard estimate was chosen to be constrained, which generated an over-identified model that was used as a base of comparison for subsequent nested models generated using the same method of path removal. Path significance was determined by the critical ratio (CR). A CR greater than the absolute value of 1.96 was considered significant (Arbuckle, 2009). To identify the most parsimonious model fitting the data reasonably well, these steps were repeated until the model retained only those variables demonstrating significance or the model fit was found to be significantly poorer than the previous model.

Determination of the adequacy of the models in representing the data was estimated with established critical values of several goodness-of-fit indicators. This was done to achieve broad statistical coverage. Indices included model chi-square statistic ( $\chi^2$ ), normed chi square statistic ( $\chi^2/\text{df}$ ), comparative fit index (CFI), Tucker-Lewis coefficient (TLI), standardized root mean square residual (SRMR), parsimony-adjusted CFI (PCFI), and root mean square error of approximation (RMSEA).

Absolute fit was assessed with the chi-square index by providing a test of the null hypothesis that the model fits the data (i.e., what is the discrepancy between the reproduced covariance matrix and the specified model structure?). Therefore, the probability associated with the chi-square statistic should be relatively large to demonstrate a good-fitting model (Bollen, 1989; Byrne, 2010). A ratio of  $\chi^2$  to degrees of freedom  $> 2$  may also be indicative of a close fit between the data and the hypothesized model (Tabachnick & Fidell, 2007). However, due to the chi-square's sensitivity to sample size, it is typical to report additional measures of model fit (Tabachnick & Fidell, 2007). The Normed Fit Index (NFI) is a comparative fit index that was the practical criterion of choice for years. Yet evidence suggested the NFI to be deficient for nested models (Schumacker & Lomax, 2004). As a result, the CFI was proposed, which is derived from a comparison of the hypothesized model with the independence model (the model that corresponds to unrelated variables), taking sample size into account (Bentler, 1990; Byrne, 2010). The TLI (also known as the non-normed fit index) is another comparative fit index that can be used to compare alternative models. Both the CFI and TLI were used in this study, with values of  $\geq .95$  indicating a satisfactory fit (Hu & Bentler, 1999).

In addition to a comparative fit index, it is recommended that studies report the SRMR (Hu & Bentler, 1999). This criterion represents the average differences between the observed and

predicted covariance, derived from fitting the variance and covariance matrices of the hypothesized model to the matrices of the sample data. Values less than or equal to .08 indicate a satisfactory fit, with lower values desired (Hu & Bentler, 1999). In order to consider the complexity of the model, the PCFI was selected. This index takes the degree of parsimony into account when assessing model fit. Larger values for the PCFI are ideal ( $\geq .50$ ; James, Mulaik, & Brett, 1982), but this criterion is usually smaller than other indices (Tabachnick & Fidell, 2007). Finally, the RMSEA was included as an estimate of model fit. The RMSEA has been recognized as one of the most informative fit indices in path analysis because it takes the error of approximation in the population, as well as the number of estimated parameters, into account (Byrne, 2010). For this study, the precision of the RMSEA was estimated with its 90% confidence interval (CI) and a significance test for closeness of fit (PCLOSE). RMSEA values of .06 or less signify a good fit between the data and the hypothesized model (Hu & Bentler, 1999), while values up to 0.08 indicate a reasonable fit (Browne & Cudeck, 1993). Standard interpretation of the PCLOSE value dictates values greater than 0.05 indicate the fit of the model is close, though it has been recommended that the test of close fit should be greater than .50 (Jöreskog & Sörbom, 1996).

The sample size for this study was deemed appropriate based on recommended minimum rules-of-thumb (Hoyle, 1995; Kline, 1998): sample size greater than 100, 15 cases per observed variable ( $15 \times 5 = 75$ ), 5 cases per parameter estimate ( $5 \times 13 = 65$ ).

Due to sample size constraints, it was not possible to assess sex differences using path analyses. Therefore, significant differences between male and female participants and each of the path variables were tested through bivariate statistics. Depending on whether the variables met parametric assumptions, a two-group (male, female) t-test or Mann-Whitney U-test was used to

compare differences in childhood maltreatment, impulsivity, hopelessness, substance use, and depression severity.

**Additional analyses.** Descriptive statistics were presented to describe the sample and bivariate analyses performed to assess simple correlations between the predictor variables and depression severity. To examine the impact of experiencing multiple types of childhood maltreatment on depression severity, impulsivity, hopelessness, and substance use, participants' responses on the maltreatment subscales were dichotomized. Specifically, youth were categorized as "maltreated" or "not maltreated" on each of the four CTQ subscales mentioned above. Then, a childhood maltreatment summary score was created by adding the number of subscales for which the threshold was exceeded. The clinical threshold scores for dichotomization of CTQ subscales are as follows: a score of 6 for sexual abuse, a score of 8 for physical abuse, a score of 9 for emotional abuse, and a score of 10 for emotional neglect (Bernstein & Fink, 1998). This summary score was used as a continuous independent variable in a series of regression analyses, with the dependent variables (depression severity, impulsivity, hopelessness, and substance use) examined separately. Beta values ( $\beta$ ) were reported to describe the increases in likelihood for each dependent variable for every one-point increment in the childhood maltreatment summary score. This technique has been used in previous research with all five categories of childhood maltreatment (Rodgers et al., 2004). Analyses were carried out in SPSS 18.0.



## Results

### Data Preparation for Path Analyses

Path analysis assumes all variables are normally distributed. Therefore, univariate and multivariate normality was assessed before performing the analyses. This revealed that the distribution for childhood emotional abuse (skewness = 4.12, kurtosis = -0.13), childhood physical abuse (skewness = 4.65, kurtosis = 0.69), childhood sexual abuse (skewness = 9.55, kurtosis = 8.48), substance use (skewness = 8.32, kurtosis = 9.44), hopelessness (skewness = 4.29, kurtosis = 1.28), and depression severity (skewness = 3.16, kurtosis = 0.21) were problematic with skew above three and/or kurtosis above four (Kline, 1998). Conducting square root transformation ( $1/\sqrt{x+c}$ ) of the path variables following the recommendations of Tabachnick and Fidell (2007) significantly improved the distribution for childhood emotional abuse (skewness = 2.75, kurtosis = -1.52), substance use (skewness = 2.24, kurtosis = 1.67), hopelessness (skewness = 0.06, kurtosis = -0.37), and depression severity (skewness = 0.23, kurtosis = -0.69). Childhood sexual and physical abuse remained non-normally distributed (skewness = 8.28, kurtosis = 5.56 and skewness = 3.16, kurtosis = -1.18, respectively). However, path analyses were conducted on these variables despite skewed distributions based on the argument that some constructs are not normally distributed in the general population (e.g., Byrne, 2010; Ullman & Bentler, 2003). Mardia's (1970) normalized estimate of multivariate kurtosis was below the value of 5.00 indicative of non-normally distributed data, suggesting multivariate normality for each of the four childhood maltreatment models (Bentler, 2005).

Multicollinearity was also assessed. No first-order correlations among measured variables used in the same model were above .60 (see Table 4), indicating multicollinearity was not an issue with these data (Kline, 1998). Six of 116 participants failed to provide responses to all

Table 4

*Pearson Correlation Matrix for Path Variables (n = 110)*

Variable	Correlation							
	1	2	3	4	5	6	7	8
1. Hopelessness	1							
2. Substance use	.080	1						
3. Depression	.508**	.306**	1					
4. Impulsivity	.535**	.385**	.588**	1				
5. Emotional abuse	.218*	.353**	.463**	.455**	1			
6. Physical abuse	.196*	.229*	.308**	.260**	.674**	1		
7. Sexual abuse	.201*	.383**	.484**	.287**	.622**	.571**	1	
8. Emotional neglect	.308**	.127	.310**	.354**	.651**	.506**	.356**	1

\*correlation is significant at the .05 level

\*\*correlation is significant at the .01 level.

items. Since AMOS 18.0 cannot provide modification indices or significance levels for direct and indirect relationships when data are missing, these cases were deleted prior to beginning the analyses. For scales where less than 20% of cases were missing, these cases were assigned a mean score based on values for the remaining scale items completed. Descriptive statistics for the study variables are presented in Table 5.

### **Childhood Emotional Abuse**

**Emotional Abuse Model A.** In accordance with the proposed theoretical model, childhood emotional abuse was positively associated with impulsivity, hopelessness, substance use, and depression severity in the just-identified model. Impulsivity was also positively associated with substance use and depression severity, while hopelessness was positively associated with depression severity (see Table 6). However, in contrast to the proposed hypothesis, hopelessness was negatively associated with substance use ( $\beta = -0.20, p = .04$ ). Furthermore, the direct path between substance use to depression severity was nonsignificant ( $\beta = 0.00, p = .97$ ). Because this modification could be theoretically justified on account of the debate regarding the direction of causality, the path linking substance use to depression severity was removed. The resultant "Emotional Abuse Model A" (EA Model A; see Figure 2) demonstrated a good fit to the data ( $\chi^2 = 0.00, df = 1, p = .996, \chi^2/df = 0.00, CFI = 1.00, TLI = 1.08, SRMR = 0.00, RMSEA = 0.00 [90\% CI = 0.00-0.00], PCLOSE = .99$ ), though the PCFI was low (0.10) due to model complexity. EA Model A was considered the final model because all remaining paths were significant (coefficients  $\geq |0.20|, p \leq .04$ ).

**Direct and indirect effects for Emotional Abuse Model A.** Table 6 presents the regression coefficients for EA Model A, which represent the relationships between each pair of variables in the path model, after controlling for the influence of every other variable. Effects of

Table 5

*Descriptive Statistics for Path Variables*

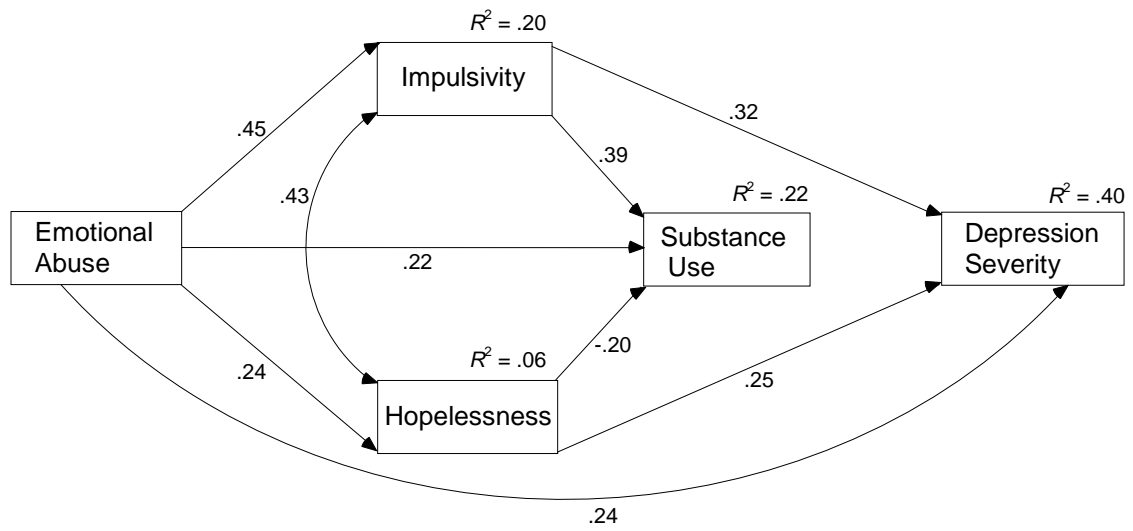
Variable	Males			Females			Total sample		
	<i>M</i>	<i>SD</i>	Range	<i>M</i>	<i>SD</i>	Range	<i>M</i>	<i>SD</i>	Range
Emotional abuse	8.61	3.90	5 - 25	13.35	6.36	5 - 25	10.47	5.49	5 - 25
Physical abuse	8.76	4.15	5 - 22	11.30	6.70	5 - 25	9.76	5.41	5 - 25
Sexual abuse	6.01	3.04	5 - 25	9.81	6.63	5 - 25	7.50	5.10	5 - 25
Emotional neglect	10.18	4.93	5 - 21	13.11	6.07	5 - 25	11.32	5.56	5 - 25
Impulsivity	64.42	11.09	42- 90	76.82	12.39	53- 104	69.27	13.06	42- 104
Hopelessness	4.18	2.86	0 - 12	5.72	4.33	0 - 17	4.78	3.57	0 - 17
Substance use	7.64	5.63	0 - 25	19.21	13.84	2 - 63	12.16	11.19	0 - 63
Depression	17.58	9.34	2 - 42	30.46	12.88	7 - 60	22.61	12.52	2 - 60
Score > 15	<i>n</i> = 36 (53.7%)			<i>n</i> = 37 (86.0%)			<i>n</i> = 73 (66.4%)		

Table 6

*Standardized Regression Estimates for Nested Emotional Abuse Models*

Path	EA Just-identified Model			EA Model A		
	$\beta$	<i>SE</i>	<i>p</i>	$\beta$	<i>SE</i>	<i>p</i>
Emotional abuse → Impulsivity	<b>0.45</b>	0.08	<b>.001</b>	<b>0.45</b>	0.08	<b>.001</b>
Emotional abuse → Hopelessness	<b>0.24</b>	0.09	<b>.009</b>	<b>0.24</b>	0.09	<b>.009</b>
Emotional abuse → Substance use	<b>0.22</b>	0.11	<b>.035</b>	<b>0.22</b>	0.11	<b>.037</b>
Emotional abuse → Depression	<b>0.24</b>	0.10	<b>.016</b>	<b>0.24</b>	0.10	<b>.016</b>
Impulsivity → Substance use	<b>0.39</b>	0.10	<b>.001</b>	<b>0.39</b>	0.10	<b>.001</b>
Impulsivity → Depression	<b>0.32</b>	0.11	<b>.005</b>	<b>0.32</b>	0.11	<b>.003</b>
Hopelessness → Substance use	<b>-0.20</b>	0.09	<b>.039</b>	<b>-0.20</b>	0.09	<b>.041</b>
Hopelessness → Depression	<b>0.25</b>	0.08	<b>.003</b>	<b>0.25</b>	0.08	<b>.002</b>
Substance use → Depression	0.00	0.09	.972	-	-	-

*Note.* Bolded values are significant.



*Figure 2.* Standard parameter estimates for the final trimmed childhood emotional abuse model:  
Emotional Abuse Model A.

the exogenous variables in the model were mixed. Although childhood emotional abuse, impulsivity, and hopelessness had a strong direct effect on both substance use and depression severity, the effect of substance use on depression severity was not significant. With respect to depression severity, the direct ( $\beta = 0.24, p = .02$ ) and indirect ( $\beta = 0.20, p = .001$ ) effects of childhood emotional abuse were significant, while impulsivity ( $\beta = 0.32, p < .01$ ) and hopelessness ( $\beta = 0.25, p < .01$ ) exerted a direct effect on depression severity. This suggests that impulsivity and hopelessness partially mediated the relationship between childhood emotional abuse and depression severity. A similar relationship was observed for substance use. Both the direct ( $\beta = 0.22, p = .04$ ) and indirect ( $\beta = 0.13, p < .01$ ) effects of childhood emotional abuse on substance use were significant, though the direct effect was almost twice as large as the indirect effect. Review of the squared multiple correlations revealed that childhood emotional abuse, impulsivity, and hopelessness, accounted for 22% of the variance in substance use and 40% of the variance in depression severity. See Table 7 for the decomposition of effects from the path analysis for the EA models. As a cautionary note, more than 85% of respondents endorsed one or more of the minimization-denial items on the Childhood Trauma Questionnaire. This suggested possible underreporting of childhood maltreatment for a large majority of male ( $n = 60$ ) and female ( $n = 34$ ) youth.

### **Childhood Physical Abuse**

**Physical Abuse Model A and Physical Abuse Model B.** The nonsignificant path with the lowest standardized coefficient in the childhood physical abuse just-identified model was substance use to depression severity ( $\beta = 0.04, p = .72$ ). Removing this path yielded Physical Abuse Model A (PA Model A). The goodness-of-fit indexes identified PA Model A to be a good fit for the data:  $\chi^2 = 0.16, df = 1, p = .69, \chi^2/df = 0.16, CFI = 1.00, TLI = 1.08, SRMR = 0.01$ ,

Table 7

*Standardized Direct and Indirect Effects of Observed Variables on Depression Severity for*

*Nested Emotional Abuse Models*

	EA Just-Identified Model		EA Model A	
	Indirect effect ( <i>p</i> )	Direct effect ( <i>p</i> )	Indirect effect ( <i>p</i> )	Direct effect ( <i>p</i> )
Emotional abuse	<b>0.20 (.002)</b>	<b>0.24 (.016)</b>	<b>0.20 (.001)</b>	<b>0.24 (.016)</b>
Impulsivity	0.00 (.971)	<b>0.32 (.005)</b>	-	<b>0.32 (.003)</b>
Hopelessness	0.00 (.988)	<b>0.25 (.003)</b>	-	<b>0.25 (.002)</b>
Substance use	-	0.00 (.972)	-	-

*Note.* Bolded values are significant.



RMSEA = 0.00 (90% CI = 0.00-0.19), PCLOSE = .73. However, nonsignificant paths remained in the model and the PCFI was low (0.10), suggesting the complexity of the model could be reduced. The path from childhood physical abuse to depression severity had the lowest standardized regression weight ( $\beta = 0.11$ ) in PA Model A, with a CR equal to 1.37 ( $p = .17$ ). Since this was below the recommended cut-off (Arbuckle, 2009), a second model was tested by eliminating this path: Physical Abuse Model B (PA Model B). Despite a low PCFI (0.20), all other criteria indicated a good fit:  $\chi^2 = 2.01$ ,  $df = 2$ ,  $p = .37$ ,  $\chi^2/df = 1.01$ , CFI = 1.00, TLI = 1.00, SRMR = 0.03, RMSEA = 0.001 (90% CI = 0.00-0.19), PCLOSE = .46. Moreover, PA Model B represented a nonsignificant improvement from the previous model ( $\chi^2_{\Delta 2} = 1.85$ ,  $p = .17$ ,  $TLI_{\Delta} = 0.08$ ) indicating that removal of the childhood physical abuse to depression severity path did not result in a significantly worse fit. In other words, inclusion of the additional path in PA Model A did not improve the model.

**Physical Abuse Model C.** To identify the most parsimonious model, an additional path was removed based on beta significance (childhood physical abuse did not predict substance use,  $p = .08$ , CR = 1.58). The revised model (Physical Abuse Model C) represented a nonsignificant difference from PA Model B ( $\chi^2_{\Delta 2} = 2.99$ ,  $p = .08$ ,  $TLI_{\Delta} = 0.07$ ). Furthermore, analyses on Physical Abuse Model C revealed an adequate fit between the model and data on several fit indices ( $\chi^2 = 5.00$ ,  $df = 3$ ,  $p = .17$ ,  $\chi^2/df = 1.67$ , CFI = 0.98, SRMR = 0.05), with an increased degree of parsimony (PCFI = 0.29). However, the TLI (0.94) and RMSEA (0.08, [90% CI = 0.00-0.20], PCLOSE = .27) indicated a poor fit. Thus, PA Model B was retained as the final path model for childhood physical abuse (see Figure 3).

**Direct and indirect effects for Physical Abuse Model B.** Similar to the final model for childhood emotional abuse, impulsivity and hopelessness had a strong direct effect on both

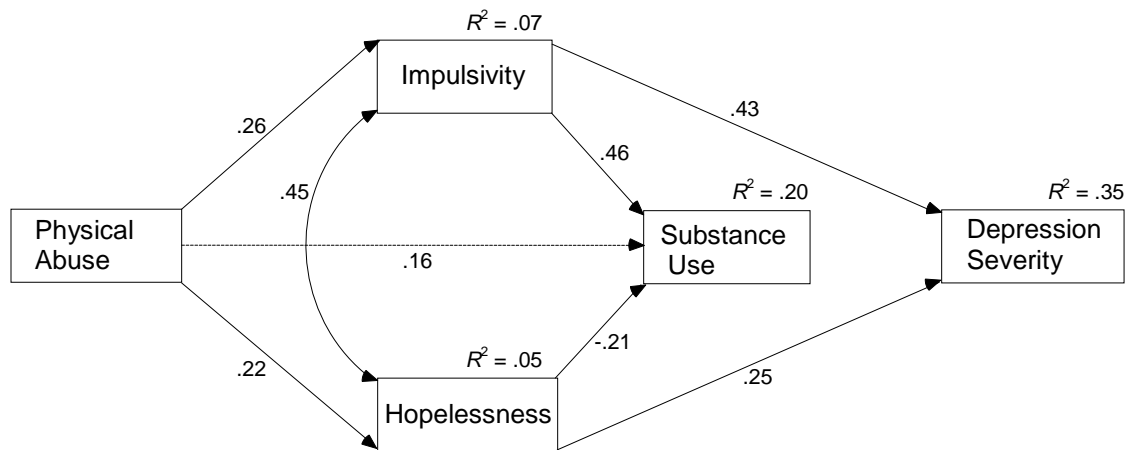


Figure 3. Standard parameter estimates for the final trimmed childhood physical abuse model: Physical Abuse Model B.

substance use and depression severity in PA Model B, while childhood physical abuse had an indirect effect on depression severity (see Table 8 and 9). However, there was no direct effect of childhood physical abuse on depression severity. These results demonstrated full mediation by hopelessness and impulsivity on the relationship between childhood physical abuse and depression severity. Childhood physical abuse did not exert a strong direct ( $\beta = 0.16, p = .13$ ) or indirect ( $\beta = 0.07, p = .09$ ) effect on substance use. Childhood physical abuse, impulsivity, and hopelessness accounted for 35% of the variance in depression severity.

### **Childhood Sexual Abuse**

**Sexual Abuse Model A.** The just-identified childhood sexual abuse model yielded similar results to the just-identified childhood emotional abuse model in that the direct path between substance use to depression severity was nonsignificant ( $\beta = -0.06, p = .45$ ), while all other paths were significant ( $\beta s > |0.21|, p < .05$ ). Therefore, the childhood sexual abuse model was tested by eliminating this path, resulting in Sexual Abuse Model A (SA Model A; see Figure 4). Although the model remained complex (PCFI = 0.10), all other indices measured indicated a good fit:  $\chi^2 = 0.46, df = 1, p = .50, \chi^2/df = 0.46, CFI = 1.00, TLI = 1.04, SRMR = 0.01, RMSEA = 0.00$  (90% CI = 0.00-0.22), PCLOSE = .55. Trimming of any additional paths resulted in a significantly worse fit, thus, SA Model A was retained as the final childhood sexual abuse model. In accordance with the other childhood maltreatment models, hopelessness was negatively associated with substance use.

**Direct and indirect effects for Sexual Abuse Model A.** Childhood sexual abuse directly affected impulsivity ( $\beta = 0.31, p = .001$ ), hopelessness ( $\beta = 0.24, p < .01$ ), substance use ( $\beta = 0.28, p < .01$ ), and depression severity ( $\beta = 0.34, p = .001$ ), as hypothesized. Furthermore, childhood sexual abuse exerted an indirect effect on substance use ( $\beta = 0.07, p = .04$ ).

Table 8

*Standardized Regression Estimates for Nested Physical Abuse Models*

Path	PA Just-identified Model			PA Model B		
	$\beta$	<i>SE</i>	<i>p</i>	$\beta$	<i>SE</i>	<i>p</i>
Physical abuse → Impulsivity	<b>0.26</b>	0.09	<b>.005</b>	<b>0.26</b>	0.09	<b>.005</b>
Physical abuse → Hopelessness	<b>0.22</b>	0.09	<b>.006</b>	<b>0.22</b>	0.09	<b>.006</b>
Physical abuse → Substance use	0.16	0.10	.126	0.16	0.10	.126
Physical abuse → Depression	0.10	0.08	.209	-	-	-
Impulsivity → Substance use	<b>0.46</b>	0.09	<b>.001</b>	<b>0.46</b>	0.09	<b>.001</b>
Impulsivity → Depression	<b>0.39</b>	0.10	<b>.001</b>	<b>0.43</b>	0.09	<b>.001</b>
Hopelessness → Substance use	<b>-0.21</b>	0.10	<b>.043</b>	<b>-0.21</b>	0.10	<b>.043</b>
Hopelessness → Depression	<b>0.24</b>	0.08	<b>.001</b>	<b>0.25</b>	0.07	<b>.001</b>
Substance use → Depression	0.04	0.08	.715	-	-	-

*Note.* Bolded values are significant.

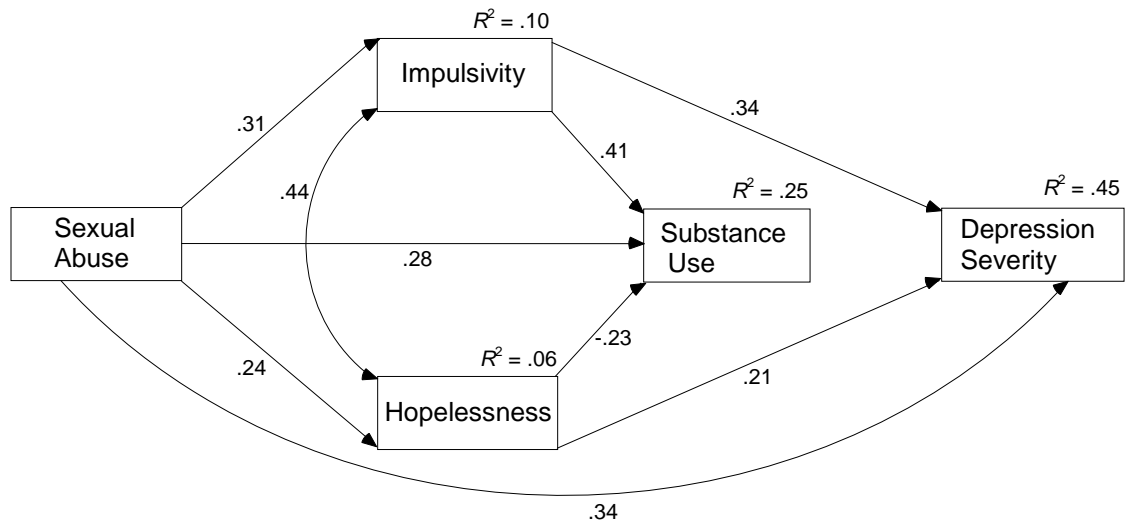
Table 9

*Standardized Direct and Indirect Effects of Observed Variables on Depression Severity for*

*Nested Physical Abuse Models*

	PA Just-Identified Model		PA Model B	
	Indirect effect ( <i>p</i> )	Direct effect ( <i>p</i> )	Indirect effect ( <i>p</i> )	Direct effect ( <i>p</i> )
Physical abuse	<b>0.16 (.001)</b>	0.10 (.209)	<b>0.17 (.001)</b>	-
Impulsivity	0.02 (.714)	<b>0.39 (.001)</b>	-	<b>0.43 (.001)</b>
Hopelessness	-0.01 (.587)	<b>0.24 (.001)</b>	-	<b>0.25 (.001)</b>
Substance use	-	0.04 (.715)	-	-

*Note.* Bolded values are significant.



*Figure 4.* Standard parameter estimates for the final trimmed childhood sexual abuse model:  
Sexual Abuse Model A.

Impulsivity had a direct effect on substance use ( $\beta = 0.41, p = .001$ ) and depression severity ( $\beta = 0.34, p = .001$ ), as did hopelessness ( $\beta = -0.23, p = .03$  and  $\beta = 0.21, p < .01$ , respectively). However, substance use did not significantly contribute to the model (see Table 10). Childhood sexual abuse accounted for 10% of the variance in impulsivity and 6% of the variance in hopelessness, while childhood sexual abuse, impulsivity, and hopelessness accounted for 25% of the variance in substance use. Collectively, SA Model A accounted for 45% of the variance in depression severity. Table 11 presents the decomposition of effects from the path analysis for the SA models, along with support for the role of impulsivity and hopelessness as partial mediators in the relationship between childhood sexual abuse and depression severity.

### **Childhood Emotional Neglect**

**Emotional Neglect Models A through D.** In the childhood emotional neglect just-identified model, childhood emotional neglect was positively associated with impulsivity and depression severity, impulsivity was positively associated with depression severity and substance use, and hopelessness was positively associated with depression severity ( $\beta s \geq 0.24, p < .01$ ). However, no additional path was significant (see Table 12). Model trimming began with the removal of childhood emotional neglect to substance use ( $\beta = -0.01, p = .997$ ), resulting in EN Model A. This trimmed model appeared to be a good fit to the data, although the parsimony index of fit was low (PCFI = 0.10) and paths with a CR of less than 1.96 remained in the model. Therefore, three additional paths were removed (substance use to depression severity, childhood emotional neglect to depression severity, and hopelessness to substance use, respectively) and model fit was assessed subsequent to each deletion (see Table 13). EN Model D was retained as the final model because of good model fit ( $df = 4, p = .22, \chi^2/df = 1.43, CFI = 0.98, TLI = 0.96, SRMR = 0.05, PCFI = 0.39, RMSEA = 0.06$  [90% CI = 0.00-0.168], PCLOSE = .35). In

Table 10

*Standardized Regression Estimates for Nested Sexual Abuse Models*

Path	SA Just-identified Model			SA Model A		
	$\beta$	<i>SE</i>	<i>p</i>	$\beta$	<i>SE</i>	<i>p</i>
Sexual abuse → Impulsivity	<b>0.31</b>	0.08	<b>.001</b>	<b>0.31</b>	0.08	<b>.001</b>
Sexual abuse → Hopelessness	<b>0.24</b>	0.08	<b>.002</b>	<b>0.24</b>	0.08	<b>.002</b>
Sexual abuse → Substance use	<b>0.28</b>	0.10	<b>.006</b>	<b>0.28</b>	0.10	<b>.006</b>
Sexual abuse → Depression	<b>0.35</b>	0.09	<b>.001</b>	<b>0.34</b>	0.08	<b>.001</b>
Impulsivity → Substance use	<b>0.41</b>	0.09	<b>.001</b>	<b>0.41</b>	0.09	<b>.001</b>
Impulsivity → Depression	<b>0.37</b>	0.09	<b>.001</b>	<b>0.34</b>	0.09	<b>.001</b>
Hopelessness → Substance use	<b>-0.23</b>	0.09	<b>.033</b>	<b>-0.23</b>	0.09	<b>.033</b>
Hopelessness → Depression	<b>0.20</b>	0.07	<b>.010</b>	<b>0.21</b>	0.07	<b>.005</b>
Substance use → Depression	-0.06	0.08	.449	-	-	-

*Note.* Bolded values are significant.



Table 11

*Standardized Direct and Indirect Effects of Observed Variables on Depression Severity for*

*Nested Sexual Abuse Models*

	SA Just-Identified Model		SA Model A	
	Indirect effect ( <i>p</i> )	Direct effect ( <i>p</i> )	Indirect effect ( <i>p</i> )	Direct effect ( <i>p</i> )
Sexual abuse	<b>0.14 (.015)</b>	<b>0.35 (.001)</b>	<b>0.16 (.001)</b>	<b>0.34 (.001)</b>
Impulsivity	-0.02 (.407)	<b>0.37 (.001)</b>	-	<b>0.34 (.001)</b>
Hopelessness	0.01 (.347)	<b>0.20 (.001)</b>	-	<b>0.21 (.005)</b>
Substance use	-	-0.06 (.449)	-	-

*Note.* Bolded values are significant.

Table 12

*Standardized Regression Estimates for Nested Emotional Neglect Models*

Path	EN Just-identified Model			EN Model D		
	$\beta$	<i>SE</i>	<i>p</i>	$\beta$	<i>SE</i>	<i>p</i>
Emotional neglect → Impulsivity	<b>0.34</b>	0.09	<b>.001</b>	<b>0.34</b>	0.09	<b>.001</b>
Emotional neglect → Hopelessness	<b>0.32</b>	0.09	<b>.001</b>	<b>0.32</b>	0.09	<b>.001</b>
Emotional neglect → Substance use	0.09	0.10	.997	-	-	-
Emotional neglect → Depression	0.10	0.10	.328	-	-	-
Impulsivity → Substance use	<b>0.48</b>	0.09	<b>.001</b>	<b>0.39</b>	0.08	<b>.001</b>
Impulsivity → Depression	<b>0.38</b>	0.11	<b>.002</b>	<b>0.43</b>	0.09	<b>.001</b>
Hopelessness → Substance use	-0.20	0.10	.073	-	-	-
Hopelessness → Depression	<b>0.24</b>	0.08	<b>.005</b>	<b>0.25</b>	0.07	<b>.001</b>
Substance use → Depression	0.05	0.08	.524	-	-	-

*Note.* Bolded values are significant.

Table 13

*Fit Indices for Trimmed Emotional Neglect Nested Models*

EN Model	$X^2$	df	$p$	$X^2/df$	CFI	TLI	SRMR	PCFI	RMSEA	90% CI	PCLOSE
A	0.01	1	.934	0.01	1.00	1.09	0.00	0.10	0.00	0.00-0.07	0.94
B	0.38	2	.827	0.19	1.00	1.08	0.01	0.20	0.00	0.00-0.11	0.87
C	1.94	3	.585	0.65	1.00	1.03	0.03	0.30	0.00	0.00-0.14	0.68
D	5.70	4	.223	1.43	0.98	0.96	0.05	0.39	0.06	0.00-0.17	0.35

*Note.* EN Model A was generated by removing the path from emotional neglect to substance use in the just-identified model; EN model B was generated by removing the path from substance use to depression severity in EN Model A; EN Model C was generated by removing the path from emotional neglect to depression severity in EN Model B; EN Model D was generated by removing the path from hopelessness to substance use in EN Model C.

CFI = comparative fit index; TLI = Tucker-Lewis coefficient; SRMR = standardized root mean square residual; PCFI = parsimony-adjusted CFI; RMSEA = root mean square error of approximation; PCLOSE = significance test for closeness of fit.

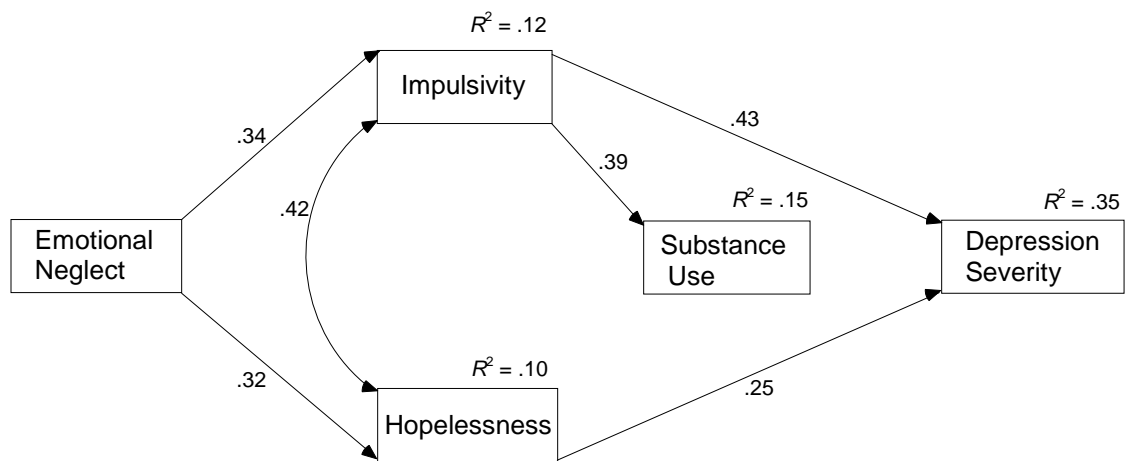
addition, this model represented a nonsignificant improvement from EN Model C ( $\chi^2_{\Delta 2} = 3.76, p = .05, TLI_{\Delta} = 0.07$ ).

**Direct and indirect effects for Emotional Neglect Model D.** In the final childhood emotional neglect model (see Figure 5), childhood emotional neglect had a direct effect on impulsivity ( $\beta = 0.34, p = .001$ ) and hopelessness ( $\beta = 0.32, p = .001$ ), impulsivity had a direct effect on substance use ( $\beta = 0.39, p = .001$ ) and depression severity ( $\beta = 0.43, p = .001$ ), and hopelessness had a direct effect on depression severity ( $\beta = 0.25, p = .001$ ). The sole indirect effect was from childhood emotional neglect to depression severity (see Table 14). This suggested the relationship between childhood emotional neglect and depression severity was completely mediated by impulsivity and hopelessness, accounting for 35% of depression severity variance. Childhood emotional neglect also had an indirect effect on substance use via impulsivity ( $\beta = 0.10, p = .04$ ), thus accounting for some of the variance in this variable ( $R^2 = 0.15$ ).

### **Sex Differences in Path Variables**

Sex differences in each of the path variables were assessed with a t-test or Mann-Whitney U-test. Impulsivity and emotional neglect had a normal distribution and were analyzed with t-tests. Mann-Whitney U-tests were performed on all other variables because of positive skew. These analyses (carried out on the non-transformed data) revealed that females scored higher than males on all the variables.

On average, females reported a greater severity of childhood emotional neglect exposure than males ( $M = 13.11, SE = 6.07$  and  $M = 10.18, SE = 4.93$ , respectively). This difference was significant ( $t(108) = -2.78, p < .01$ ) and approached a medium effect size ( $r = 0.26$ ). There was also a significant sex difference in the reports of childhood emotional abuse and childhood



*Figure 5.* Standard parameter estimates for the final trimmed childhood emotional neglect model: Emotional Neglect Model D.

Table 14

*Standardized Direct and Indirect Effects of Observed Variables on Depression Severity for*

*Nested Emotional Neglect Models*

	EN Just-Identified Model		EN Model D	
	Indirect effect ( <i>p</i> )	Direct effect ( <i>p</i> )	Indirect effect ( <i>p</i> )	Direct effect ( <i>p</i> )
Emotional neglect	<b>0.21 (&lt;.001)</b>	0.10 (.328)	<b>0.23 (.001)</b>	-
Impulsivity	0.03 (.506)	<b>0.38 (.002)</b>	-	<b>0.43 (.001)</b>
Hopelessness	-0.01 (.399)	<b>0.24 (.005)</b>	-	<b>0.07 (.001)</b>
Substance use	-	0.05 (.524)	-	-

*Note.* Bolded values are significant.

sexual abuse (see Table 15). Females reported greater impulsivity than males ( $M = 76.82$ ,  $SE = 1.89$  and  $M = 64.42$ ,  $SE = 1.36$ , respectively). This difference was significant ( $t(108) = -5.47$ ,  $p < .001$ ), and represented a medium-sized effect ( $r = 0.47$ ). Similarly, sex differences were identified for substance use ( $U = 595.50$ ,  $z = -5.28$ ,  $p < .001$ ) and depression severity ( $U = 606.50$ ,  $z = -5.11$ ,  $p < .001$ ), with lower scores for males. The differences between female and male reports of childhood physical abuse and hopelessness did not reach statistical significance.

### **Cumulative Childhood Maltreatment**

Table 16 presents the sample characteristics with respect to childhood maltreatment. Based on the CTQ-SF manual cut-offs, 77.3% of the youth ( $n = 85$ ) were classified as having experienced at least one form of childhood maltreatment, with more than one-third of the sample ( $n = 42$ ) reporting three or four types of childhood maltreatment. To analyze the impact of cumulative childhood maltreatment, a series of simple regressions were conducted with depression severity, impulsivity, hopelessness, and substance use as dependent variables. Depression severity ( $F(1,65) = 8.66$ ,  $p < .01$ ,  $R^2 = 0.12$ ) and impulsivity ( $F(1,65) = 5.84$ ,  $p < .02$ ,  $R^2 = 0.08$ ) increased as a function of cumulative childhood maltreatment among males (see Table 17). Hopelessness also increased as a function of the childhood maltreatment summary score for male youth ( $F(1,65) = 16.55$ ,  $p < .001$ ), with cumulative maltreatment accounting for 20.3% of the variance in hopelessness. However, cumulative childhood maltreatment was not significantly related to any of the path variables for females (see Table 17).

### **Discussion**

Childhood maltreatment can affect the severity of incarcerated adolescents' depression through a variety of pathways. The main purpose of the present study was to extend past research by examining the mediating role of impulsivity, hopelessness, and substance use on the

Table 15

*Mann-Whitney U-tests for Sex Differences in Path Variables*

Variable	<i>Mdn</i>		<i>U</i>	<i>z</i>	<i>p</i>	<i>n</i>
	Males	Females				
Emotional abuse	8.00	13.00	<b>843.00</b>	-3.68	<b>&lt;.001</b>	110
Physical abuse	8.00	9.00	1185.50	-1.61	.108	110
Sexual abuse	5.00	5.00	<b>978.50</b>	-3.49	<b>&lt;.001</b>	110
Hopelessness	3.00	5.00	1205.00	-1.45	.147	110
Substance use	7.00	16.00	<b>595.50</b>	-5.28	<b>&lt;.001</b>	110
Depression	16.00	29.00	<b>606.50</b>	-5.11	<b>&lt;.001</b>	110

*Note.* Bolded values are significant.



Table 16

*Youth Exceeding Thresholds for Childhood Maltreatment Subscales Based on CTQ-SF Manual*

*Scores*

Variable	Males	Females	Total sample
	<i>n</i> (% males)	<i>n</i> (% females)	<i>n</i> (% total)
Emotional abuse			
<i>Score</i> $\geq 9$	25 (37.3%)	29 (67.4%)	54 (49.1%)
Physical abuse			
<i>Score</i> $\geq 8$	35 (52.2%)	24 (55.8%)	59 (53.6 %)
Sexual abuse			
<i>Score</i> $\geq 6$	13 (19.4%)	20 (46.5%)	33 (30.0%)
Emotional neglect			
<i>Score</i> $\geq 10$	31 (46.3%)	28 (65.1%)	59 (53.6%)

Table 17

*Relationship Between the Childhood Maltreatment Summary Score and Depression,*

*Hopelessness, Impulsivity, and Substance Use*

Dependent variable	Males ( <i>n</i> = 67)				Females ( <i>n</i> = 43)			
	<i>B</i>	<i>SE</i>	$\beta$	<i>p</i>	<i>B</i>	<i>SE</i>	$\beta$	<i>p</i>
Depression	<b>2.57</b>	0.87	.34	<b>.005</b>	1.87	1.25	.23	.142
Hopelessness	<b>1.03</b>	0.25	.45	<b>.000</b>	0.25	0.43	.09	.569
Impulsivity	<b>2.56</b>	1.06	.29	<b>.018</b>	1.70	1.20	.22	.165
Substance Use	0.61	0.56	.13	.279	1.88	1.34	.21	.170

*Note.* Bolded values are significant.

relationship between childhood maltreatment and depression severity. Although previous research has examined the association between some of the variables presented in this investigation, this is the first study to integrate all the variables investigated into one theoretical model. The proposed theoretical model was tested on a sample of incarcerated youth using path analysis. The final model fits across each of the maltreatment subtypes were good, suggesting preliminary support for the trimmed models and, in particular, the mediating role of hopelessness and impulsivity in the relationship between childhood maltreatment and depression severity. Furthermore, the majority of the findings were consistent with prior research and the broader theoretical perspectives that guided this study. Overall, the study findings provided partial support for the hypotheses.

### **Impulsivity and Hopelessness as Mediators**

Consistent with previous research (Brown et al., 1999; Gibb et al., 2003; Harkness et al., 2006; Teicher et al., 2006), a greater severity of childhood maltreatment (for all subtypes) was related to greater depression severity. Moreover, for all four childhood maltreatment subtypes, this relationship was mediated by impulsivity and hopelessness. Specifically, the effects of childhood sexual and emotional abuse on depression severity were partially explained by adolescents' impulsivity and hopelessness, while impulsivity and hopelessness fully explained the association between depression severity and both physical abuse and emotional neglect. This partial mediation suggests that childhood emotional and sexual abuse had lingering effects on depression severity, after controlling for the influence of impulsivity and hopelessness. Perhaps these subtypes of childhood maltreatment confer a greater risk for depression than emotional neglect or physical abuse. In a longitudinal study of maltreatment and depression, Brown et al. (1999) found that childhood sexual abuse (compared to physical abuse or neglect) put

individuals at the greatest risk for depressive disorders. Furthermore, research has supported Rose and Abramson's (1992) hypothesis that childhood emotional abuse is more likely than other forms of childhood maltreatment to contribute to the development of depression symptoms (Gibb, Alloy, Abramson, & Marx, 2003).

Results of the path analyses supported the association between negative events, hopeless cognitions, and symptoms of depression repeatedly demonstrated in the extant literature (DuRant et al., 1995; Feiring et al., 1998; Garber & Flynn, 2001; Gibb & Coles, 2005). According to Rose and Abramson (1992; see also Cole & Turner, 1993) negative life events, and resulting negative attributions about the future, leave individuals vulnerable to developing depression. In other words, negative life events such as childhood maltreatment and negative attributions about the future are risk factors for depression and increased depression severity. The results of this study suggest that the effects of experiencing maltreatment during childhood may result in an increase of hopeless thoughts about the future. These hopeless thoughts about the future, in turn, may contribute to the development of depression symptoms and/or increase depression severity.

Previous research has been less clear on the role of impulsivity in relation to negative events such as childhood maltreatment and symptoms of depression (Brodsky et al., 2001; Swann et al., 2008). Impulsivity has been described as a consequence of traumatic events by diminishing the individual's capacity to inhibit behaviours and modulate emotions (Braquehais et al., 2010). The present study offers additional support that childhood maltreatment may put adolescents at higher risk to react without thinking about potential consequences, which might increase depression severity. As suggested by other researchers (e.g., Gerra et al., 2007), neurobiological impairment could explain the link between traumatic events, impulsivity, and depression. For instance, traumatic events can lead to a reduction in serotonin levels and reduced

availability of serotonin has been linked to an inability to modulate emotional responses (e.g., Braquehais et al., 2010; Lindstrom et al., 2004). The appraisal theory of emotional states offers another explanation for the association between impulsivity and depression. This theory posits that sadness arises when our potential for coping with a negative event is compromised (Scherer, 2001). Therefore, impulsive adolescents may have increased depression severity because they are more likely to employ inappropriate strategies for coping with negative life events than non-impulsive adolescents (e.g., d'Acremont & Van der Linden, 2007).

Alternatively, impulsivity may be a marker for depression severity rather than a causal risk factor, where a marker describes a variable that has a non-causal relationship to the outcome (Kazdin, Kraemer, Kessler, Kupfer, & Offord, 1997). In this scenario, the apparent influence of impulsivity on depression may be better accounted for by a third variable not assessed in the theoretical model. For instance, impulsivity has consistently predicted delinquency and criminal behaviour (Brennan, Mednick, & Mednick, 1993; Case & Haines, 2007; Fagan, Van Horn, Hawkins, & Arthur, 2007; Farrington & Coid, 2003; Herrenkohl et al., 2000; Klinteberg, Andersson, Magnusson, & Sattin, 1993). If criminal behaviour is associated with an increase in the risk of incarceration (Beaver, DeLisi, Mears, & Stewart, 2009), and incarceration leads to increased depression severity, then incarceration may explain the link between impulsivity and depression severity in this sample.

Each subtype of childhood maltreatment was expected to have a direct effect on depression severity after controlling for associations with impulsivity and hopelessness. Results supported this hypothesis for sexual and emotional abuse. However, impulsivity and hopelessness fully mediated this relationship for the remaining childhood maltreatment subtypes. Although depression severity was correlated with physical abuse and emotional neglect at the

bivariate level, when impulsivity and hopelessness were accounted for in the path models, physical abuse and emotional neglect no longer contributed significantly to depression severity. This is an important finding that requires replication. It implies that, once impulsivity and hopelessness are addressed, childhood maltreatment (particularly physical abuse and emotional neglect) may no longer be an important or necessary target for the treatment of depression. However, caution is warranted with this interpretation of the results, especially in light of the cross-sectional nature of this study. It is also plausible that addressing childhood maltreatment would lead to decreases in depression severity, along with decreased impulsivity and hopelessness. In addition, Shrout and Bolger (2002) noted that partial mediation may represent model misspecification by underestimating the effect of indirect relationships due to error associated with the measurement of the mediators.

### **Substance Use as a Mediator**

Contrary to expectation, results only partially supported the hypothesized relationship between substance use and childhood maltreatment. Greater severity of emotional abuse and sexual abuse resulted in increased substance use. However, neither physical abuse nor emotional neglect was found to have a direct effect on substance use. Although research supports the association between substance use and the experience of maltreatment as a child, much of the literature focuses explicitly on childhood sexual abuse (Hawke et al., 2000; Steel & Herlitz, 2005; Wonderlich et al., 2001). One potential explanation for this finding is that the relationship between childhood physical abuse and emotional neglect may be moderated by another variable such as sex. In a longitudinal study of childhood physical abuse and substance use in adolescence and early adulthood, physical abuse was found to predict substance use for females but not males

(Lansford, Dodge, Pettit, & Bates, 2010). Similar findings have been reported with respect to sex differences in relation to substance use and childhood neglect (Wilson & Widom, 2009).

Surprisingly, substance use was not associated with depression severity in any of the childhood maltreatment models and, therefore, did not mediate the effect of path variables on depression severity. This finding may offer some insight into the direction of causality between substance use and depression severity. Problematic substance use has been speculated to stem from an attempt to ameliorate negative affect such as depression (Kuo et al., 2006; VanZile-Tamsen et al., 2006). For example, use of methamphetamine to cope with mood was reported by women with increased severity of depressive symptoms (Semple et al., 2007). Perhaps depression influences substance use as opposed to substance use influencing depression. A longitudinal test of the self-medication hypothesis of substance use among adolescents may inform our understanding of a causal relationship between depression severity and substance use.

Alternatively, the lack of statistical findings with respect to substance use may have resulted from a limitation of the study's design. For instance, persistence of substance use could not be confirmed, nor could substance abuse or substance dependence be determined. Previous research has often investigated substance use disorders (Clingempeel, Britt, & Henggeler, 2008; Cuomo, Sarchiapone, Giannantonio, Mancini, & Roy, 2008; Rowe et al., 2008) or use of individual substances (Waller et al., 2006; Wiesner & Windle, 2006), rather than frequency of substance use across different drugs. The results of this study may not generalize to the method employed for measuring substance use in other studies. Despite having good reliability, our measure of substance use failed to capture the influence of specific types of substances on depression severity.

## **Sex Differences and Cumulative Childhood Maltreatment**

Females' self-reports of each of the path variables (impulsivity, hopelessness, substance use, depression severity, and the childhood maltreatment subtypes) were greater than males' self-reports. With the exception of childhood physical abuse and hopelessness, these differences were significant. These findings are largely supported by previous research, suggesting that female offenders have a greater frequency and severity of mental health problems than male offenders, (Cauffman, 2004; Domalanta et al., 2003; Teplin et al., 2002), along with higher rates and longer durations of childhood maltreatment (McClellan et al., 1997; Miller et al., 1995; Moffitt et al., 2001).

With respect to cumulative maltreatment, male adolescents' depression severity, hopelessness, and impulsivity scores increased as a function of cumulative childhood maltreatment, but not for female offenders. These findings point to the particularly deleterious effect of childhood maltreatment for incarcerated male youth. Surprisingly, cumulative childhood maltreatment was not related to any of the dependent variables investigated in this study for female adolescents. This suggests that the cumulative influence of maltreatment subtypes experienced in childhood does not influence adolescent females' severity of depression, impulsivity, hopelessness, or substance use. Caution is warranted, however, in interpreting these results, especially considering that childhood maltreatment is a known risk factor for a range of maladaptive outcomes, including substance use, impulsivity, hopelessness, and depression severity (Bergen et al., 2004; Grilo, Sanislow, Fehon, Martino, & McGlashan, 1999; Powers et al., 2009; Wolfe et al., 2001). An alternative explanation involves the way in which the cumulative childhood maltreatment scale was created. Dichotomizing childhood maltreatment subtypes not only results in a lack of information about the frequency of specific childhood



maltreatment events, but also assumes equal weighting for each of the subtypes of childhood maltreatment.

### **Limitations and Future Directions for Research**

It is important to take note of the limitations of the present study. First, the sample size was small. Despite being appropriate for path analysis, a larger sample size would have allowed for the application of structural equation modeling and the exploration of childhood maltreatment as a latent variable. For instance, a sample size of 120 would satisfy the 15 cases per observed variable rule-of-thumb ( $15 \times 8 = 120$ ), although a sample size of 200 has been suggested for SEM (e.g., Hoelter, 1983). The small sample size also precluded analyzing sex differences in the path model. Second, the design of the study was cross-sectional. The relationship between childhood maltreatment and the development of depression symptoms is well-supported in the literature, yet the findings from the current study are limited since temporal precedence between variables could not be confirmed. Despite investigating current depression severity in relation to past childhood maltreatment, the timing at which maltreatment occurred relative to the onset of depression symptomatology was unknown. Future studies would benefit from a prospective longitudinal design to clarify the relations between variables across time.

Third, it is unknown to what extent the results of this study are generalizable to other samples. For instance, the relationship between childhood maltreatment and depression severity may look different among this sample of incarcerated adolescents than the general population, incarcerated adults, or adolescents incarcerated in other countries. Furthermore, it is unclear if this model holds across the lifespan or is particular to a brief portion of the developmental period. As such, it is important to replicate this study in other samples.

Fourth, although the childhood maltreatment models by subtype account for between 35% to 45% of the variance in depression severity, a large portion of depression severity remains unexplained. A more inclusive model including additional variables not considered here might improve our understanding of the factors that mediate or moderate the relationship between childhood maltreatment and depression severity for delinquent youth. For example, previous research has identified depression to be related to exposure to other adverse events (Wilhelm et al., 2006), low self-esteem (Overholser, Adams, Lehnert, & Brinkman, 1995), poor physical health (Lewinsohn, Gotlib, & Seeley, 1995), and parental depression (Brennan, Hammen, Katz, & Le Brocque, 2002).

Fifth, common method variance may have introduced systematic bias into the study. Using a common method to collect data may cause observed relationship between variables to differ from true relationships, thus artificially inflating or deflating correlations among variables (Doty & Glick, 1998; Reio, 2010). Although the present study protected against common method variance by providing clear instructions for completing questionnaires and ensuring confidentiality and anonymity of the youth, this threat might be further minimized in future studies by collecting data at multiple time points or obtaining data for the measurement of variables from different sources (Reio, 2010).

Sixth, obtaining childhood maltreatment information through self-report has been identified as a weakness in previous studies. However, self-report data may actually give a better account of maltreatment history than official reports because many cases of maltreatment history are not reported to authorities (Trocmé et al., 2005).

## **Implications and Conclusion**

Based on the results of this study, impulsivity and hopelessness appear to play an important mediating role in determining the effects of childhood maltreatment on depression severity. Substance use, contrary to expectation, did not mediate the relationship between childhood maltreatment and depression severity. Although further investigation is necessary to confirm cause and effect relationships between the variables measured in this study, the results suggest that childhood maltreatment, impulsivity, and hopelessness may be important factors to address in the clinical research on depression.

Proper treatment interventions could help reduce these youths' psychological distress, and may have the additional benefit of reducing their likelihood of committing future criminal acts. Similar to depression severity and a history of abuse or neglect, impulsivity and hopelessness have been implicated as risk factors for criminal offending. Individual differences in impulsivity have been consistently associated with illegal behaviours, including juvenile delinquency and criminal recidivism (Andrews & Bonta, 2006; Carroll et al., 2006). In fact, Gottfredson and Hirshi's (1990) general theory of crime posits impulsivity to be a key component of criminal propensity. Hopelessness also has been suggested to contribute to delinquency, such that these youths may consider failure to be inevitable and see little reason for caution (Lorion & Saltzman, 1993). Because child maltreatment, impulsivity, and hopelessness might be antecedents of both depression severity and general antisocial behaviour, they may be particularly important risk factor to address during a period (correctional confinement) where treatment is accessible to these youth. As demonstrated repeatedly, a significant proportion of youth in conflict with the law “graduate” to the adult justice system by committing additional crimes after being released from custody (e.g., Day, Bevc, Theodor, Rosenthal, & Duchesne, 2008).

Appendix A:  
Recruitment Flyer

# Research Participants Needed!

**Research Project:** Health Behaviour and Young People in Contact with the Legal System

**Who are we?** A research team at Ryerson University and York University in Toronto in the departments of Psychology and Nursing (Ryerson) and Kinesiology (York U)

**Why are we interested?** There is an interest among people who work with youth about the kinds of risky health-related behaviours that some young people who are involved in the legal system engage in. However, not a lot is known about what young people think and feel about these behaviours and the reasons they engage in behaviours that can put themselves in harm's way.

**Purpose:** To find out what kinds of risky health-related behaviours some young people who have contact with the law engage in and what they think and feel about these behaviours.

**Who can participate?** Any youth ages 12 – 18 who has had contact with the youth justice system.

**What will happen during the study?** Participants will spend about 1 hour with a member of our research team answering questions about some health-related behaviours, how you think and feel about yourself, and about your family background.

**Privacy and Confidentiality:** Participation in this study is completely voluntary. Participants can choose not to answer any questions, request a break, or withdraw from the study at any time. All information from the study will be kept confidential.

Young people will be paid \$15 as a thank you for participation.

**Interested?** Contact (Name of on-site contact person) at...

Health Behaviour Study  
Contact: (Name of on-site contact person)

Health Behaviour Study  
Contact: (Name of on-site contact person)

Health Behaviour Study  
Contact: (Name of on-site contact person)

Health Behaviour Study  
Contact: (Name of on-site contact person)

Health Behaviour Study  
Contact: (Name of on-site contact person)

Health Behaviour Study  
Contact: (Name of on-site contact person)

Health Behaviour Study  
Contact: (Name of on-site contact person)

Health Behaviour Study  
Contact: (Name of on-site contact person)

## Appendix B:

### Consent Form for Participants 16 Years of Age or Older

**Consent Form**  
**Information for Adolescents (16 years and older)**

**Study Name: Health Behaviours and Young People in Contact with the Legal System**

You are being asked to participate in a research study. It is your choice to take part or not. Before you agree to volunteer to be part of the study, it is important that you understand what is going to happen during the study. We will read these pages and ask as many questions as you need to make sure you understand what you will be asked to do.

**Who are the researchers?**

The researchers are four teachers of adolescent development and health behaviour at Ryerson University and York University who want to understand the reasons why some young people engage in certain risky health-related behaviours. Their names are Dr. David Day, Dr. Trevor Hart, and Dr. Beth McCay (Ryerson University) and Dr. Alison Macpherson (York University).

**Why are we doing this study?**

We want to learn all about the kinds of health-related behaviours young people engage in that can put themselves in harm's way and the reasons that they do them. It is important that you know that there are no "right" or "wrong" answers to these questions; we are looking for your *views* about these things. We are hoping to include about 85 young people, such as yourself, ages 12-17 years, who live in a residential facility or group home for youth who have contact with the legal system. After we learn about all these things we will work with staff to help them understand how staff can better work with young people to help young people make healthy choices.

**What will you be asked to do?**

If you decide to participate in this study, the researchers will get information about you by asking you to answer some questions. The questions will ask about the way you think and feel about yourself and about your behaviour. The questions will ask about many different things. Some examples of these things are whether you have done certain types of behaviours like get into fights, smoke cigarettes, use certain types of drugs, or engaged in sexual behaviours, as well as some things about your family and about things that might have happened to you when you were younger. You will also be asked about lots of feelings, including anger, frustration, hope, strength, happiness, and trust. As well, you will note that some questions repeat themselves, that is, are asked more than one time. Some sample questions include, "*I have great faith in the future (True/False);*" "*I like doing things for thrill of it (True/False);*" "*Have you ever had sexual intercourse?*" *Have you ever been taught about AIDS or HIV infection in school?*

### **Will anything weird happen?**

Sometimes it is hard to answer questions about yourself and sometimes it may make you feel uncomfortable. You should only answer the questions you feel comfortable answering. You will be answering the questions in a quiet place and at your own pace, so this should make things easier. If any questions in the study make you feel uncomfortable, you can skip them, or even decide to stop the study altogether. If you decide to withdraw from the study, all associated data collected will be immediately destroyed where possible. As well, if you are upset or find that completing the questions makes you think about difficult things, you can make a definite request to speak with a clinical staff member, confidentially.

### **Why is this study important?**

This study is important because it will help us understand why some young people engage in risky health-related behaviours and what staff at facilities for young people might be able to do to make the program better for young people such as yourself. We are not the only ones who will learn from your answers; you will probably learn about your own feelings and reactions in situations. When we are done looking at your answers and all the answers of other young people, you are welcome to look at what we have found and ask questions, but you will not know the names of the young people who gave us the information.

### **Who will read my answers?**

When we look at the answers you give us no one but you and the person interviewing you will know that they were your answers. For the study, you will be given a special identification number that only you and the person interviewing you will know, so that we know which questionnaires go together; but your name will not go on any of the questionnaires and no one will know which number goes with your name. All your answers to the questions will be stored in a locked filing cabinet until the answers can be entered into a computer. After the answers are in the computer the question forms will be destroyed. The computer file is protected by password. Only Dr. David Day, Dr. Trevor Hart, Dr. Beth McCay, and Dr. Alison Macpherson and their trained research staff will be able to see the answers. You will be asked to sign this consent form, but the papers with your name will be kept away from your answers.

The information that we get from the questionnaires will be shown to other people who work with young people and their families. This information will only talk about young people as a group; no one will know who participated in the study.

There are only some times that the law tells us that we have to tell the residential or group home manager your name and your answers. If your answers tell us that you have been hurt by anyone or that you want to hurt yourself or someone else or if your answers tell us about any criminal activities not already known to authorities, we have to tell the residential or group home manager.

### **Why should I participate?**

Your answers will be helping people who work with young people and their families understand young people better. Because we really appreciate your help with this study, we will give you \$15.00 as a small token of our appreciation.



**Voluntary Participation:**

It is completely your choice to participate in this study or not. If you choose to participate, you will receive the same program at the residence or group home now or at any time in the future.

**Questions about the Study:**

If you have any questions about the study now, please ask. If you have any questions later about the research, you can contact:

**Dr. David Day,  
Ryerson University  
416-979-5000, extension 7104 (after pressing “1”)**

If you have questions about the rules that researchers must follow when studying people, you can contact Ryerson University or York University for information, at the numbers below:

**Research Ethics Board**

c/o Office of the Vice President, Research and Innovation  
Ryerson University  
350 Victoria Street  
Toronto, ON M5B 2K3  
**Tel. (416) 979-5042**

**Office of Research Services**

Suite 309, York Lanes  
York University  
4700 Keele Street  
Toronto, ON M3J 1P3  
**Tel: (416) 736-5914**  
[ore@yorku.ca](mailto:ore@yorku.ca)

Do you have any questions? Would you like to participate?

**Agreement:**

Your signature below indicates that you have read the information in this agreement and have had a chance to ask any questions you have about the study. Your signature also indicates that you agree to be in the study and have been told that you can change your mind and withdraw consent to participate at any time. You have been given a copy of this agreement.

You have been told that by signing this consent agreement you are not giving up any of your legal rights.

\_\_\_\_\_  
Name of Participant (please print)

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of Investigator

\_\_\_\_\_  
Date

Appendix C:  
Parental Consent Form

Consent Form  
**Information for Guardians**

**Study Name: Health Behaviours and Young People in Contact with the Legal System**

Your son or daughter is being asked to participate in a research study. Before your son or daughter agrees to volunteer, it is important that you read the following information and ask as many questions as necessary to be sure you understand what he or she will be asked to do. Your son or daughter is also being provided with this information and asked to provide his or her assent (on the same form).

**Researchers:**

David M. Day, Ph.D., C.Psych., Associate Professor, Department of Psychology, Ryerson University

Trevor A. Hart, Ph.D., C.Psych., Assistant Professor, Department of Psychology, Ryerson University

Beth McCay, Ph.D., R.N., Associate Professor, School of Nursing, Ryerson University

Alison Macpherson, Ph.D., Assistant Professor, Department of Kinesiology, York University

**Purpose of the Study:**

The purpose of this study is to examine the kinds of health-related behaviours young people engage in that can put themselves in harm's way and to understand the reasons behind these behaviours. We are hoping to include about 85 participants, ages 12-17 years, who live in a residential facility or group home for youth who have contact with the legal system. Using this information (without your name), the researchers will be able to work with facilities for young people to better understand the needs of the youth and to provide better services.

**Description of the Study:**

If your son or daughter decides to participate in this research, he or she will be asked to complete some standardized psychological questionnaires that describe a number of aspects of your son or daughter's feelings and behaviour, including sadness and aggression, and questions about your son or daughter's sexual behaviour, drug-related behaviour, and aggressive behaviours, as well as demographic information. These will take approximately 50-60 minutes to complete.

Additional information will be gathered through standardized psychological questionnaires filled out by your son or daughter about the way he or she thinks and feels about himself or herself and about his or her behaviour. Questions will focus on a range of experiences including whether he or she has done certain types of behaviours like get into fights, smoke cigarettes, or use certain types of drugs, has engaged in sexual behaviours, as well as some things about his or her family and about some things that might have happened to him or her when he or she was young. Your son or daughter will also be asked about how he or she feels sometimes, including sadness,

frustration, anger, but also feelings of hope, strength, happiness, and trust. As well, some questions repeat themselves, that is, are asked more than one time. Some sample questions include, “*I have great faith in the future (True/False);*” “*I like doing things for thrill of it (True/False);*” “*Have you ever had sexual intercourse?*” *Have you ever been taught about AIDS or HIV infection in school?*

### **Risks or Discomforts:**

Occasionally, individuals feel uncomfortable answering questions about themselves. Your son or daughter will be instructed to only answer the questions he or she is comfortable addressing. Your son or daughter will also be completing the questionnaires in a quiet place and at his or her own pace, so this should make him or her more comfortable. However, if any aspect of the study makes him or her feel uncomfortable, he or she is free to skip certain questions, or withdraw at any time without penalty. If he or she decides to withdraw from the study, all associated data collected will be immediately destroyed where possible. As well, if your son or daughter is upset or finds that completing the questions makes him or her think about difficult things, he or she can make a definite request to speak with a clinical staff member, confidentially.

### **Benefits of the Study:**

This study is important in helping us understand more clearly and completely the health-related behaviours of young people who live in residential or group home facilities for youth in contact with the legal system and to understand if changes are required to improve the program. We also anticipate that the young people will benefit from the study by learning more about their emotional responses to a variety of situations. Once we have analyzed all the information, you and your son or daughter are welcome to view the findings (without any identifying information) and ask further questions.

### **Confidentiality:**

Your son or daughter’s responses in this study will be completely anonymous; his or her name or any other identifying information will not appear on any of the questionnaires. These questionnaires are only identified by a pre-assigned ID number. They will be stored in a locked filing cabinet until questionnaire responses can be entered into a data base, for two years; after they are entered, the questionnaires will be destroyed. The data base is protected by password. Only Dr. Day, Dr. Hart, Dr. McCay, and Dr. Macpherson and their trained research staff have access to these materials.

There are some limitations to confidentiality. The law requires that the proper authorities are notified if it is suspected that a person is in need of protection, if it is suspected that a person might harm himself or herself or someone else, or if the person discloses information about any other criminal activities not already known to authorities. Any such disclosures will be discussed with the residential manager, who will determine necessary steps.

You will be asked to sign this consent form, as will your son or daughter, but these will be filed separately from the questionnaires materials. When the data are published or presented, it will only be presented in summary form (i.e., answers will be averaged across all individuals who participate in the study), so no individual can be identified by his or her responses. The computer-stored data will be discarded five years following the publication of results.

**Incentives to Participate:**

Your son or daughter's contribution to this study is very important to improving our knowledge in this area. To compensate for his or her time, we will give him or her \$15.00 as a small token of our appreciation.

**Voluntary Participation:**

Participation in this study is completely voluntary and does not affect the services you and your son or daughter receives. If you allow your son or daughter to participate, you and your son or daughter will receive the same services at this time or at any time in the future. If you decide to allow your son or daughter to participate, he or she is free to stop participation at any time without consequences to the services you and your son or daughter receive. At any particular point in the study, your son or daughter may refuse to answer any particular question or stop participation altogether.

**Questions about the Study:**

This project has been approved by the research ethics boards of Ryerson University and York University. If you have any questions regarding the research, you may contact:

**Dr. David Day,  
Ryerson University  
416-979-5000, extension 7104 (after pressing "1")**

If you have questions about the rules that researchers must follow when studying people, your parents/guardians can contact Ryerson University or York University for information, at the numbers below:

**Research Ethics Board**

c/o Office of the Vice President, Research and Innovation  
Ryerson University  
350 Victoria Street  
Toronto, ON M5B 2K3  
**Tel. (416) 979-5042**

**Office of Research Services**

Suite 309, York Lanes  
York University  
4700 Keele Street  
Toronto, ON M3J 1P3  
**Tel: (416) 736-5914**  
[ore@yorku.ca](mailto:ore@yorku.ca)

**Agreement:**

Your signature below indicates that you have read the information in this agreement and have had a chance to ask any questions you have about the study. Your signatures also indicate that you agree to have your son or daughter participate in the study and have been told that your son or daughter can change his or her mind and withdraw consent to participate at any time. You have been given a copy of this agreement.

You have been told that by signing this consent agreement you are not giving up any of your legal rights.

---

Name of Participant (please print)

---

Signature of Parent/Guardian for Minors

---

Date

---

Signature of Investigator

---

Date

Appendix D:

Consent Form for Participants 15 Years of Age or Younger

**Assent Form**  
**Information for Adolescents (under 16 years old)**

**Study Name: Health Behaviours and Young People in Contact with the Legal System**

You are being asked to participate in a research study. It is your choice to take part or not. Before you agree to volunteer to be part of the study, it is important that you understand what is going to happen during the study. We will read these pages and ask as many questions as you need to make sure you understand what you will be asked to do. We have already asked your parent or guardian if it is okay for you to participate in the study.

**Who are the researchers?**

The researchers are four teachers of adolescent development and health behaviour at Ryerson University and York University who want to understand the reasons why some young people engage in certain risky health-related behaviours. Their names are Dr. David Day, Dr. Trevor Hart, and Dr. Beth McCay (Ryerson University) and Dr. Alison Macpherson (York University).

**Why are we doing this study?**

We want to learn all about the kinds of health-related behaviours young people engage in that can put themselves in harm's way and the reasons that they do them. It is important that you know that there are no "right" or "wrong" answers to these questions; we are looking for your *views* about these things. We are hoping to include about 85 young people, such as yourself, ages 12-17 years, who live in a residential facility or group home for youth who have contact with the legal system. After we learn about all these things we will work with staff to help them understand how staff can better work with young people to help young people make healthy choices.

**What will you be asked to do?**

If you decide to participate in this study the researchers will get information about you by asking you to answer some questions. The questions will ask about the way you think and feel about yourself and about your behaviour. The questions will ask about many different things. Some examples of these things are whether you have done certain types of behaviours like get into fights, smoke cigarettes, use certain types of drugs, or engaged in sexual behaviours, as well as some things about your family and about things that might have happened to you when you were younger. You will also be asked about lots of feelings, including anger, frustration, hope, strength, happiness, and trust. As well, you will note that some questions repeat themselves, that is, are asked more than one time. Some sample questions include, "*I have great faith in the future (True/False);*" "*I like doing things for thrill of it (True/False);*" "*Have you ever had sexual intercourse?*" *Have you ever been taught about AIDS or HIV infection in school?*



### **Will anything weird happen?**

Sometimes it is hard to answer questions about yourself and sometimes it may make you feel uncomfortable. You should only answer the questions you feel comfortable answering. You will be answering the questions in a quiet place and at your own pace, so this should make things easier. If any questions in the study make you feel uncomfortable, you can skip them, or even decide to stop the study altogether. If you decide to withdraw from the study, all associated data collected will be immediately destroyed where possible. As well, if you are upset or find that completing the questions makes you think about difficult things, you can make a definite request to speak with a clinical staff member, confidentially.

### **Why is this study important?**

This study is important because it will help us understand why some young people engage in risky or dangerous health-related behaviours and what staff at facilities for young people might be able to do to make the program better for young people such as yourself. We are not the only ones who will learn from your answers; you will probably learn about your own feelings and reactions in situations. When we are done looking at your answers and all the answers of other young people, you and your parent/guardian are welcome to look at what we have found and ask questions, but you will not know the names of the young people who gave us the information.

### **Who will read my answers?**

When we look at the answers you give us no one but you and the person interviewing you will know that they were your answers. For the study, you will be given a special identification number that only you and the person interviewing you will know, so that we know which questionnaires go together; but your name will not go on any of the questionnaires and no one will know which number goes with your name. All your answers to the questions will be stored in a locked filing cabinet until the answers can be entered into a computer. After the answers are in the computer the question forms will be destroyed. The computer file is protected by password. Only Dr. David Day, Dr. Trevor Hart, Dr. Beth McCay, and Dr. Alison Macpherson and their trained research staff will be able to see the answers. You and your parent/guardian will be asked to sign this consent form, but these papers with your names will be kept away from your answers.

The information that we get from the questionnaires will be shown to other people who work with young people and their families. This information will only talk about young people as a group; no one will know who participated in the study.

There are only some times that the law tells us that we have to tell the residential or group home manager your name and your answers. If your answers tell us that you have been hurt by anyone or that you want to hurt yourself or someone else or if your answers tell us about any criminal activities not already known to authorities, we have to tell the residential or group home manager.

### **Why should I participate?**

Your answers will be helping people who work with young people and their families understand young people better. Because we really appreciate your help with this study, we will give you \$15.00 as a small token of our appreciation.

**Voluntary Participation:**

It is completely your choice to participate in this study or not. If you choose to participate, you will receive the same program at the residence or group home now or at any time in the future.

**Questions about the Study:**

If you have any questions about the study now, please ask. If you have any questions later about the research, you can talk to your parents/guardian and they will contact:

**Dr. David Day,  
Ryerson University  
416-979-5000, extension 7104 (after pressing “1”)**

If you have questions about the rules that researchers must follow when studying people, you and your parents/guardians can contact Ryerson University or York University for information, at the numbers below:

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c/o Office of the Vice President, Research and Innovation  
Ryerson University  
350 Victoria Street  
Toronto, ON M5B 2K3  
**Tel. (416) 979-5042**

**Office of Research Services**

Suite 309, York Lanes  
York University  
4700 Keele Street  
Toronto, ON M3J 1P3  
**Tel: (416) 736-5914**  
[ore@yorku.ca](mailto:ore@yorku.ca)

Do you have any questions? Would you like to participate?

**Assent**

I was present when \_\_\_\_\_ read/was read this form and gave written/verbal assent.

\_\_\_\_\_  
Name of person who obtained verbal assent

## Appendix E:

Study Approval from Ryerson University Research Ethics Board

**RYERSON UNIVERSITY**  
RESEARCH ETHICS BOARD

To: David Day  
Re: REB 2008-202: A Model of Sexual Risk and Injury Risk Behaviours Among Young Offenders  
Date: September 6, 2010

Dear David Day,

The review of your protocol REB File REB 2008-202 is now complete. This is a renewal for REB File REB 2008-202-1. The project has been approved for a one year period. Please note that before proceeding with your project, compliance with other required University approvals/certifications, institutional requirements, or governmental authorizations may be required.

This approval may be extended after one year upon request. Please be advised that if the project is not renewed, approval will expire and no more research involving humans may take place. If this is a funded project, access to research funds may also be affected.

Please note that REB approval policies require that you adhere strictly to the protocol as last reviewed by the REB and that any modifications must be approved by the Board before they can be implemented. Adverse or unexpected events must be reported to the REB as soon as possible with an indication from the Principal Investigator as to how, in the view of the Principal Investigator, these events affect the continuation of the protocol.

Finally, if research subjects are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and approvals of those facilities or institutions are obtained and filed with the REB prior to the initiation of any research.

Please quote your REB file number (REB 2008-202) on future correspondence.

Congratulations and best of luck in conducting your research.



Nancy Walton, Ph.D.  
Chair, Research Ethics Board

## Appendix F:

Study Approval from York University Research Ethics Board



OFFICE OF  
RESEARCH  
ETHICS (ORE)  
Fifth Floor, YRT

4700 Keele St.  
Toronto ON  
Canada M3J 1P3  
Tel 416 736 5914  
Fax 416 736 5837  
[www.research.yorku.ca](http://www.research.yorku.ca)

## RENEWAL

<b>Certificate #:</b>	<b>2009 – 083</b>
<b>Renewal Approved:</b>	<b>05/12/10</b>
<b>5<sup>th</sup> Amendment Approved:</b>	<b>01/11/10</b>
<b>4<sup>th</sup> Amendment Approved:</b>	<b>12/14/09</b>

## Memo

**To:** Professor David Day, Ryerson University, [dday@ryerson.ca](mailto:dday@ryerson.ca)  
Professor Alison MacPherson, York University, [alison3@yorku.ca](mailto:alison3@yorku.ca)

**Cc:** Bojana Petrovic, Ryerson University, [bpetrovic@ryerson.ca](mailto:bpetrovic@ryerson.ca)

**From:** Alison M. Collins-Mrakas, Sr. Manager and Policy Advisor, Research Ethics  
(on behalf of Daphne Winland, Chair, Human Participants Review Committee)

**Date:** **Wednesday May 12<sup>th</sup>, 2010**

**Re:** Ethics Approval

A Model of Sexual Risk and Injury Risk Behaviours Among Young Offenders

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With respect to your research project entitled, "A Model of Sexual Risk and Injury Risk Behaviours Among Young Offenders", the committee notes that, as there are no substantive changes to either the methodology employed or the risks to participants in the research project or any other aspect of the project, a renewal of approval re the above project is granted.

Should you have any questions, please feel free to contact me at: 416-736-5914 or via email at: [acollins@yorku.ca](mailto:acollins@yorku.ca).

Yours sincerely,

Alison M. Collins-Mrakas M.Sc., LLM  
Sr. Manager & Policy Advisor, Research Ethics

Appendix G:

Study Approval from the Ministry of Community Safety and Correctional Services/MCYS

Youth Justice Research Committee

Ministry of Children  
and  
Youth Services

Ministère des Services  
à l'enfance et à la  
jeunesse

Ministry of Children and  
Youth Services

Ministère des  
Services  
à l'enfance et à la  
jeunesse



Research and Outcome  
Measurement Branch

Direction de la recherche  
et de la mesure des  
résultats

Youth Justice Services

Services de justice  
pour la jeunesse

Strategic Policy and  
Planning Division  
15<sup>th</sup> Floor  
56 Wellesley St. W.  
Toronto, ON M5S 2S3  
Tel: (416) 326-3567  
Fax: (416) 327-0570

Division des politiques et  
de la planification  
stratégiques  
15<sup>e</sup> étage  
56, rue Wellesley Ouest  
Toronto, ON M5S 2S3  
Tél. : (416) 326-3567  
Télééc. : (416) 327-0570

Director of Operational  
Support  
8<sup>th</sup> Floor  
800 Bay Street  
Toronto, ON M5S 3A9  
Tel: (416) 212-6298  
Fax: (416) 327-2418

Directeur soutien  
opérationnel  
8<sup>e</sup> étage  
800, rue Bay  
Toronto, ON M5S 3A9  
Tél.: (416) 212-6298  
Télééc.: (416) 327-2418

March 13, 2009

Dr. David M. Day, C.Psych.  
Associate Professor  
Department of Psychology  
Ryerson University  
350 Victoria Street  
Toronto, Ontario  
M5B 2K3

**RE: Research Project - "A Model of Sexual Risk and Injury Risk Behaviours  
among Young Offenders"**

Dear Dr. Day:

On the recommendation of the Correctional Services Research Committee, we have approved the participation of the Ministry in your research project. Please complete the attached *Research Agreement* and return it to:

Ms Julie Van Nood  
Program Effectiveness, Statistics and Applied Research Unit  
Ministry of Community Safety and Correctional Services  
200 First Avenue W.,  
North Bay, ON  
P1B 9M3

Contact Dr. Greg Brown, Chair, Correctional Services/Youth Justice Research Committee at (705) 474-3461 extension 4454 to make the necessary arrangements to conduct your research.

....cont'd.



- 2 -

We wish you much success in your research, and look forward to receiving a report of your findings.

Yours truly,



Jeff Wright  
Director  
Research and Outcome Measurement Branch



JoAnn Miller-Reid  
Director  
Operational Support

Attachment

cc. Nadia Mazaheri, Manager, Effective Programming, Operational Support, MCYS  
L. Guzzo, Manager, Program Effectiveness, Statistics and Applied Research

Appendix H:  
Demographic Information

Participation I.D.: \_\_\_\_\_

Today's Date \_\_\_\_\_

**Date of Birth** \_\_\_\_/\_\_\_\_/\_\_\_\_ (mm/dd/yyyy)

**Age** (in years) \_\_\_\_\_

**Please check the appropriate box or boxes for the following demographic questions:**

**Gender**

- ☐ Male
- ☐ Female
- ☐ Other gender identity (please specify): \_\_\_\_\_

**How would you describe your sexual orientation?**

- ☐ Exclusively heterosexual (*attracted to people of the opposite gender as yourself*)
- ☐ Heterosexual, with some homosexual experience
- ☐ Bisexual (*attracted to people of both genders*)
- ☐ Homosexual, with some heterosexual experience
- ☐ Exclusively homosexual (*attracted to people of the same gender as yourself*)

**Please indicate your highest completed level of education:**

- ☐ Grade 7 or lower
- ☐ Grade 8
- ☐ Grade 9
- ☐ Grade 10
- ☐ Grade 11
- ☐ Grade 12
- ☐ First year college/university or higher

**What Religion do you identify with?**

- ☐ Catholic
- ☐ Protestant
- ☐ Christian
- ☐ Jewish
- ☐ Islamic
- ☐ Hindu
- ☐ Sikh
- ☐ Buddhist
- ☐ Eastern Orthodox
- ☐ Agnostic
- ☐ None
- ☐ Other (please specify) \_\_\_\_\_

**Ethnic background (check as many as apply to you):**

- ☐ African (e.g., Nigeria, Ghana, Ethiopia)
- ☐ African-Caribbean (i.e., from the Caribbean and of Black/African descent)
- ☐ Indo-Caribbean (i.e., from the Caribbean and of South Asian descent)
- ☐ Other Caribbean (i.e., from the Caribbean and of other ethnic descent)
- ☐ South Asian (e.g., India, Pakistan, Bangladesh, Sri Lanka)
- ☐ East Asian (e.g., Hong Kong, China, Vietnam, Korea, Philippines)
- ☐ Middle Eastern or North African (e.g., Iran, Israel, Egypt, Morocco)
- ☐ White - British and/or Irish background (e.g., England, Scotland, Wales, Ireland)
- ☐ White - Italian
- ☐ White - Portuguese
- ☐ White - Greek
- ☐ White - Eastern European (e.g., Russia, Ukraine, Romania)
- ☐ White - Other European (e.g., Germany, France)
- ☐ Hispanic / Latino/a (e.g., Mexico, Puerto Rico, Cuba)
- ☐ Aboriginal (e.g., First Nations, Inuit, Métis, Native American)
- ☐ Other (please specify) \_\_\_\_\_

In the above question, there was a list of ethnic backgrounds. However, this list may or may not specify how you identify. Regardless of your answer to the previous question, how do you identify your ethnic background(s)?

**Ethnically, I identify as:**

\_\_\_\_\_

**In what country were you born?** \_\_\_\_\_

**How long have you lived in Canada?** \_\_\_\_\_ (specify in years)

**When not residing in this facility where and with whom (if anyone) do you reside with?** (you may check more than one box).

- ☐ By myself
- ☐ Roommates
- ☐ Both parents in household
- ☐ Mother only in household
- ☐ Father only in household
- ☐ Grandparents
- ☐ Other Family Members
- ☐ Group or residential program
- ☐ Other (please specify) \_\_\_\_\_

**Is this the first time you have been in a youth custody centre?**

- ☐ YES      ☐ NO

**How long have you been in the youth custody centre this time?**

- ☐ Less than 1 month  
☐ 1 to 3 months  
☐ 4 to 8 months  
☐ 9 to 12 months  
☐ 13 or more months

**Were you at another facility directly before coming here?**

- ☐ YES      ☐ NO

**If YES, how long were you at the other facility?**

- ☐ Less than 1 month  
☐ 1 to 3 months  
☐ 4 to 8 months  
☐ 9 to 12 months  
☐ 13 or more months

**This time, what have you been charged with or convicted of? *(Mark all that apply)***

- ☐ Break and enter  
☐ Theft or possession of stolen property  
☐ Robbery  
☐ A drug offence (possession or trafficking)  
☐ Breach or escape (breach of probation or bail, escaping lawful custody, etc.)  
☐ Weapons offence  
☐ Solicitation  
☐ Homicide  
☐ Assault/uttering threats  
☐ A sexual offence  
☐ Other, please specify: \_\_\_\_\_

**In the past, what have you been charged with or convicted of? *(Mark all that apply)***

- ☐ Nothing, this is my first charge or conviction  
☐ Break and enter  
☐ Theft or possession of stolen property  
☐ Robbery  
☐ A drug offence (possession or trafficking)  
☐ Breach or escape (breach of probation or bail, escaping lawful custody, etc.)  
☐ Weapons offence  
☐ Solicitation  
☐ Homicide  
☐ Assault/uttering threats  
☐ A sexual offence  
☐ Other, please specify: \_\_\_\_\_

Appendix I:

Ontario Student Drug Use and Health Survey

The next section is about alcohol and other drugs. These questions are followed by a list of answers. Choose the answer that is right for you and indicate your choice in one of the boxes to the left. Please answer all questions even if you have never tried these drugs.

1. In the LAST 12 MONTHS before coming to this facility, how often did you use CANNABIS (also known as marijuana, “weed”, “grass”, hashish, hash oil, etc.)?

☐ 1 or 2 times  
☐ 3 to 5 times  
☐ 6 to 9 times  
☐ 10 to 19 times  
☐ 20 to 39 times  
☐ 40 or more times  
  
☐ Used but not in the last 12 months  
☐ Never used in lifetime  
☐ Don’t know what cannabis is

2. In the LAST 12 MONTHS before coming to this facility, how often did you use HEROIN (also known as “H”, “junk”, “smack”, etc.)?

☐ 1 or 2 times  
☐ 3 to 5 times  
☐ 6 to 9 times  
☐ 10 to 19 times  
☐ 20 to 39 times  
☐ 40 or more times  
  
☐ Used but not in the last 12 months  
☐ Never used in lifetime  
☐ Don’t know what heroin is

3. In the LAST 12 MONTHS before coming to this facility, how often did you use METHAMPHETAMINE or speed?

☐ 1 or 2 times  
☐ 3 to 5 times  
☐ 6 to 9 times  
☐ 10 to 19 times  
☐ 20 to 39 times  
☐ 40 or more times  
  
☐ Used but not in the last 12 months  
☐ Never used in lifetime  
☐ Don’t know what “speed” is

4. In the LAST 12 MONTHS before coming to this facility, how often did you use “ICE”, the crystallized form of methamphetamine (also known as “crystal meth”, “crank”)?

☐ 1 or 2 times  
☐ 3 to 5 times  
☐ 6 to 9 times  
☐ 10 to 19 times  
☐ 20 to 39 times  
☐ 40 or more times  
  
☐ Used but not in the last 12 months  
☐ Never used in lifetime  
☐ Don’t know what “ice” is

5. In the LAST 12 MONTHS before coming to this facility, how often did you use LSD or “acid”?

- ☐ 1 or 2 times
- ☐ 3 to 5 times
- ☐ 6 to 9 times
- ☐ 10 to 19 times
- ☐ 20 to 39 times
- ☐ 40 or more times
- ☐ Used but not in the last 12 months
- ☐ Never used in lifetime
- ☐ Don’t know what LSD is

6. In the LAST 12 MONTHS before coming to this facility, how often did you use PCP (also known as “angel dust”, “horse tranquilizer”, etc.)?

- ☐ 1 or 2 times
- ☐ 3 to 5 times
- ☐ 6 to 9 times
- ☐ 10 to 19 times
- ☐ 20 to 39 times
- ☐ 40 or more times
- ☐ Used but not in the last 12 months
- ☐ Never used in lifetime
- ☐ Don’t know what PCP is

7. In the LAST 12 MONTHS before coming to this facility, how often did you use HALLUCINOGENS, OTHER THAN LSD OR PCP (such as Mescaline and Psilocybin, also known as “magic mushrooms”, “mesc”, etc.)?

- ☐ 1 or 2 times
- ☐ 3 to 5 times
- ☐ 6 to 9 times
- ☐ 10 to 19 times
- ☐ 20 to 39 times
- ☐ 40 or more times
- ☐ Used but not in the last 12 months
- ☐ Never used in lifetime
- ☐ Don’t know what hallucinogens are

8. In the LAST 12 MONTHS before coming to this facility, how often did you use COCAINE (also known as “coke”, “blow”, “snow”, “powder”, “snort”, etc.)?

- ☐ 1 or 2 times
- ☐ 3 to 5 times
- ☐ 6 to 9 times
- ☐ 10 to 19 times
- ☐ 20 to 39 times
- ☐ 40 or more times
- ☐ Used but not in the last 12 months
- ☐ Never used in lifetime
- ☐ Don’t know what cocaine is

9. In the LAST 12 MONTHS before coming to this facility, how often did you use cocaine in the form of “CRACK”?

- ☐ 1 or 2 times
- ☐ 3 to 5 times
- ☐ 6 to 9 times
- ☐ 10 to 19 times
- ☐ 20 to 39 times
- ☐ 40 or more times
- ☐ Used but not in the last 12 months
- ☐ Never used in lifetime
- ☐ Don’t know what “crack” is

10. In the LAST 12 MONTHS before coming to this facility, how often did you use MDMA or “ECSTASY” (also known as “X”)?

- ☐ 1 or 2 times
- ☐ 3 to 5 times
- ☐ 6 to 9 times
- ☐ 10 to 19 times
- ☐ 20 to 39 times
- ☐ 40 or more times
- ☐ Used but not in the last 12 months
- ☐ Never used in lifetime
- ☐ Don’t know what “ecstasy” is



**11. In the LAST 12 MONTHS before coming to this facility, how often did you use OXYCONTIN (also known as “oxy”, “OC”) WITHOUT A PRESCRIPTION or without a doctor telling you to take it?**

- ☐ 1 or 2 times
- ☐ 3 to 5 times
- ☐ 6 to 9 times
- ☐ 10 to 19 times
- ☐ 20 to 39 times
- ☐ 40 or more times
- ☐ Used non-medically, but not in the last 12 months
- ☐ Never used non-medically in lifetime
- ☐ Don't know what OxyContin is

**12. In the LAST 12 MONTHS before coming to this facility, how often did you use STIMULANTS such as diet pills and stay awake pills (also known as “uppers”, “bennies”, “dexies”, “pep pills”, etc.) WITHOUT A PRESCRIPTION?**

- ☐ 1 or 2 times
- ☐ 3 to 5 times
- ☐ 6 to 9 times
- ☐ 10 to 19 times
- ☐ 20 to 39 times
- ☐ 40 or more times
- ☐ Used non-medically, but not in the last 12 months
- ☐ Never used non-medically in lifetime
- ☐ Don't know what stimulants are

**13. In the LAST 12 MONTHS before coming to this facility, how often did you use ADRENOCHROMES (also known as “wagon wheels”)?**

- ☐ 1 or 2 times
- ☐ 3 to 5 times
- ☐ 6 to 9 times
- ☐ 10 to 19 times
- ☐ 20 to 39 times
- ☐ 40 or more times
- ☐ Used but not in the last 12 months
- ☐ Never used in lifetime
- ☐ Don't know what adrenochromes are

**14. In the LAST 12 MONTHS before coming to this facility, how often did you use SEDATIVES or TRANQUILLIZERS (such as Valium, Ativan, Xanax, also known as “tranqs”, “downers”, etc.) WITHOUT A PRESCRIPTION or without a doctor telling you to take them?**

- ☐ 1 or 2 times
- ☐ 3 to 5 times
- ☐ 6 to 9 times
- ☐ 10 to 19 times
- ☐ 20 to 39 times
- ☐ 40 or more times
- ☐ Used non-medically, but not in the last 12 months
- ☐ Never used non-medically in lifetime
- ☐ Don't know what sedatives are

**15. In the LAST 12 MONTHS before coming to this facility, how often did you use medicine that is usually used to treat ADHD (such as Ritalin, Concerta, Adderall, Dexedrine) WITHOUT A PRESCRIPTION?**

- ☐ 1 or 2 times
- ☐ 3 to 5 times
- ☐ 6 to 9 times
- ☐ 10 to 19 times
- ☐ 20 to 39 times
- ☐ 40 or more times
- ☐ Used non-medically, but not in the last 12 months
- ☐ Never used non-medically in lifetime
- ☐ Don't know what this medicine is

**16. In the LAST 12 MONTHS before coming to this facility, how often did you use PAIN RELIEF PILLS (such as Percocet, Percodan, Tylenol #3, Demerol, OxyContin, codeine) WITHOUT A PRESCRIPTION or without a doctor telling you to take them? (We do not mean regular Tylenol or Aspirin that anyone can buy in a drugstore.)**

- ☐ 1 or 2 times
- ☐ 3 to 5 times
- ☐ 6 to 9 times
- ☐ 10 to 19 times
- ☐ 20 to 39 times
- ☐ 40 or more times
- ☐ Used non-medically, but not in the last 12 months
- ☐ Never used non-medically in lifetime
- ☐ Don't know what pain relief pills are

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