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The Impact of Maltreatment on Children and Youth: Exploring the Potential Mediating Effects of Resilience to Traumatic Life Events

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A thesis submitted in partial fulfillment of the requirements for the Master of Arts degree in Education

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Abstract

Childhood is an acutely vulnerable period for trauma, as it can significantly influence normative childhood development. Specifically, trauma resulting from maltreatment (i.e., neglect, sexual abuse, physical abuse, and witnessing domestic violence) offers unique challenges, as it often includes violations of boundaries and trust by caretakers. The aim of the present study was to examine child and youth maltreatment, and its impact on internalizing (e.g., mood disturbances) and externalizing behaviours (e.g., behavioural deviance). The sample was comprised of 9,002 participants who were assessed between the years of 2012-2017 on the interRAI Child and Youth Mental Health instrument (ChYMH). The ChYMH is a standard of care intake assessment used in many mental health agencies across Ontario, Canada, for individuals between four to 18 years of age. Individual and systemic forms of resiliency were of interest in predicting outcomes of maltreatment, which were found to mediate the relationship between maltreatment trauma and internalizing and externalizing behaviours. Further, significant differences in internalizing and externalizing scores were detected across no maltreatment, one type of maltreatment trauma, and polytrauma, with some deviations across sex and age groups. Implications for trauma-informed intervention and policy are discussed.

Keywords: developmental trauma, maltreatment, internalizing and externalizing behaviours, resilience

Acknowledgments

According to my supervisor, Dr. Alan Leschied, this is the section to write about how great my parents are, and I am happy to oblige. I am beyond grateful for their contributions to my education. As well, I am thankful for my grandmother, who has been my greatest cheerleader though she only understands about half of what I tell her about this life that takes place over 6,000 km away from her.

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“Anything that is ‘wrong’ with you began as a survival mechanism in childhood”

Dr. Gabor Maté

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Exploring the Impact of Maltreatment in Children and Youth and the Mediating Effects of Resilience to Traumatic Life Events

Post Traumatic Stress Disorder (PTSD) is recognized as a common mental health concern among war veterans and first responders. However, trauma is not limited to individuals caught in life threatening situations; it can affect anyone, at any stage of life who has experienced an *aversive life event* (ALE). ALEs refer to stressors that surpass the threshold for ordinary daily challenges and hardships that can have temporary, mild to severe impact on the quality of life. Thus, ALEs are more likely to hold formative or lasting impact over an individual's life course. (Bonanno, 2004; Seery, 2011).

Research suggests that childhood is a particularly vulnerable period for trauma, as it can significantly influence subsequent normative development of children through the life course (Van der Kolk et al., 2009). Van der Kolk's remarkable work in the field of developmental traumatology suggested that ALEs may affect brain development, impact distress tolerance and even accelerate puberty (2009). Likewise, adult survivors of child maltreatment were observed to hold higher levels of aggression as well as lower levels of self-esteem, autonomy, purpose in life, perceived constraints, happiness, and satisfaction for three decades following their victimization (Herrenkohl, Klika, Herrenkohl, Russo, & Dee, 2012). Moreover, studies suggest that the impact of sexual trauma in particular exceeds the combined, maladaptive results of multiple non-sexual traumas (Rahim, 2014; Van der Kolk et al., 2009). Yet, current evolving research suggests that *polytrauma*, which refers to the experience of multiple forms of trauma or victimization, may hold greater implications than any single instance or type of developmental trauma victimization, including sexual trauma (Leschied, personal communication, December 8, 2017). Nevertheless, researchers and clinicians invested in developmental traumatology (DT) are aware that a majority of those affected by ALEs will not suffer lasting, visible, or debilitating repercussions (Bonanno,

2004; Choi et al., 2017). Yet, it is important to acknowledge the many children and youth who suffer the consequences, many of whom will not seek or have access to therapeutic services. In fact, a comprehensive Statistics Canada report revealed that more than nine in ten (93%) victims of childhood physical and/or sexual abuse do not report the abuse to either police or child protection services before they turned 15 years of age (Alaggia, 2010). Indeed, a majority of victims (67%) did not speak to anyone, including friends or family (Burczycka, 2015). Choi and colleagues (2017) noted that neglected and marginalized minority children were less likely to receive services. Among those who did disclose abuse, females were more likely than males to discuss abuse with their friends (12% versus 9%), and victims of multiple instances of maltreatment were more likely to turn to authorities (Burczycka, 2015) and utilize services (Choi et al., 2017).

Currently, no official diagnostic criterion exists within the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) for victims of childhood trauma. However, a conceptualization of developmental trauma disorder (DTD) has been proposed (Van der Kolk et al., 2009). Researchers and clinicians agree that the multifaceted effects of developmental trauma are not sufficiently reflected in a diagnosis of Post-Traumatic Stress Disorder (PTSD). PTSD is typically characterized by re-experiencing traumatic events, hyper-arousal, emotional numbing, substance misuse, and anxiety (Rahim, 2014). Importantly, children are less likely to qualify for a diagnosis of PTSD, despite the high prevalence of childhood maltreatment trauma (Rahim, 2014). Symptoms not reflected in a PTSD diagnosis include significant disturbances in affect regulation, attention and concentration, negative self-image, impulse control, aggression, and risk taking (Van der Kolk et al., 2009). Thus, victims of developmental trauma are often misdiagnosed, or not diagnosed at all, which can have the effect of limiting access to appropriate treatment without a formal diagnosis. Likewise, those diagnosed with PTSD often hold comorbid

diagnoses that reflect seemingly unrelated symptoms not recognized by the current PTSD criteria but would be reflected by the proposed DTD (Van der Kolk et al., 2009). For the lack of a more appropriate diagnostic option within the current DSM, trauma symptoms are split between seemingly unrelated co-morbidities that include bipolar disorder, ADHD, PTSD, conduct disorder, reactive attachment disorder, and anxiety disorder.

Thus, clinicians that work within a trauma-informed framework face the dilemma of either not diagnosing a client who was unable to meet clinical thresholds, meaning the child will likely not receive any services, or knowingly misdiagnose the child in an effort to at least access some level of treatment (Rahim, 2014). The latter choice would still fail to acknowledge the all-encompassing, life-altering impact of trauma, with the corresponding treatment to alleviate individual symptoms, not the underlying traumatic experience.

The aim of the proposed study was to examine developmental trauma, specifically child and youth maltreatment, and its impact on internalizing (e.g., mood disturbances) and externalizing disorders (e.g., behavioural deviance). Of interest in predicting outcomes of ALEs was the nature and degree of individual and systemic resiliencies, which are hypothesized to serve as mediators to past trauma.

Literature Review

Child and youth maltreatment

The umbrella of developmental trauma includes various ALEs, ranging from loss of a loved one, the experience of emotional abuse, living in a violent neighbourhood or war zone, to suffering maltreatment (Rahim, 2014; Van der Kolk et al., 2009). Maltreatment stands out as unique, as it habitually includes violations of trust and boundary violations as a result of a conscious act by a caretaker or non-family member in close proximity to the minor. For the

purpose of the proposed study, maltreatment encompasses neglect, physical and sexual abuse, as well as witnessing domestic violence.

Van der Kolk (2009) described child physical and sexual abuse as well as neglect as disturbingly common occurrences. Rahim (2014) argued that neglect, which he classified as the most common form of childhood maltreatment, detrimentally impacts cognitive, emotional, and behavioural development in children and youth. Findings from the 2014 General Social Survey analyzed by Statistics Canada revealed that one-third of Canadians aged 15 and older (33%) experienced some form of child maltreatment prior to the age of 15 years (Burczycka, 2015). This finding was in the context of childhood physical abuse which was reported by 26% of Canadians, 8% for reported sexual abuse, and 10% in witnessing domestic violence, which constitutes violence by a parent or guardian against another adult in the home and in the presence of a child/adolescent. The majority of child witnesses – seven in ten (70%) – also reported having been the victim of childhood physical and/or sexual assault. The majority (65%) of victims of childhood physical and/or sexual abuse reported having been abused between one and six times, while 20% reported between seven and 21 instances of combined maltreatment. Alarming, one in seven victims (15%) reported having been abused at least 22 times. Notably, Indigenous peoples and those identifying as gay, lesbian, and bisexual experienced higher abuse prevalence rates (Burczycka, 2015). Adult victims of child maltreatment were more likely to engage in illicit substance use and binge drinking, report poorer physical and mental health, and experience violence in adulthood (e.g., intimate partner violence; Burczycka, 2015).

Internalizing and externalizing behaviours

Behavioural deviance can be easily observed; however, moods and thought processes are less obvious. Achenbach (1966) initially conceptualized the constructs of *internalizing and externalizing behaviours*; internalizing symptoms refer to problems of withdrawal, somatic

complaints, and anxiety/depression, whereas externalizing symptoms exhibit themselves in delinquent and aggressive behaviours. Achenbach (1966) stressed that the dichotomous label is not intended to carry dynamic implications. Rather, it signifies that externalizing symptoms describe conflict with the environment, whereas internalizing disorders describe problems within the self. Achenbach's original factor analysis of 300 male and 300 female child psychiatric patients noted that internalizers were more likely to perform better at school, have fewer social problems, and reside with their biological parents. Referring to Bandura's social learning theory, Achenbach drew the conclusion that internalizers' social learning regimes (e.g., parent role modelling) had successfully eliminated antisocial behaviours which are frequently observed in externalizers.

Burlaka, Bermann, and Graham-Bermann (2015), examined 183 children, of which 93 were males and 54% were Caucasian, from urban and rural schools in the Midwest (US). These researchers noted that the observed youth reported higher levels of both internalizing and externalizing behaviours in boys. They also noted an association between internalizers and lower maternal education. Moreover, Gauthier-Duchesne, Hébert, and Daspe (2017) conducted a path analysis with a sample of 447 sexually abused children (319 girls and 128 boys, aged 6–12 years). Being male, experiencing a sense of guilt, and the closeness of the perpetrator's relationship to the child predicted externalizing problems. Likewise, Gonzalez, MacMillan, Tanaka, Jack, and Tonmyr (2014) noted that exposure to emotional and physical intimate partner violence (witnessing domestic violence) was significantly associated with an increased risk of internalizing problems.

Crijnen, Achenbach and Verhulst (1997) analyzed data from the Child Behaviour Check List (CBCL) for 13,697 juveniles, age six to 17 years, from general cross-cultural population samples in Australia, Belgium, China, Germany, Greece, Israel, Jamaica, the Netherlands, Puerto

Rico, Sweden, Thailand, and the United States. They reported cross-cultural consistency for age and gender variations in externalizing and internalizing scores, with the externalizing dimensions decreasing while internalizing scores increased with age; boys recorded higher externalizing and lower internalizing scores than girls.

Whereas behavioural deviance is often thought to symbolize rebelliousness, negative moods are too often understood and dismissed as ‘typical’ adolescent moodiness. Researchers and clinicians alike recognize these externalizing and internalizing behaviours as potential dysfunctional coping strategies of youth who have experienced significant challenges such as ALEs. In fact, developmental trauma is frequently linked to deviant behaviours that includes aggression, expulsion from school, and involvement with the criminal justice system (Van der Kolk et al., 2009). These manifestations fall within the DSM-5 diagnostic criteria for conduct disorder. According to the DSM-5 (American Psychiatric Association [APA], 2013), criteria for conduct disorder (CD) include individuals who present as being relatively unconcerned regarding past problematic performance, not putting forth a sustained effort, and blaming others for their poor performance. Likewise, emotional expression is limited and can be employed for gain, which is reflected in the manipulation or intimidation of others. Children with CD have frequently been diagnosed with oppositional defiant disorder (ODD), less severe emotional dysregulation and relational conflict, and frequent displays of physical aggression, and/or disturbed peer relationships (APA, 2013). Relevant to the purpose of the present study, environmental factors contributing to CD include physical and/or sexual abuse, parental rejection and neglect, frequent change of caregivers, and association with delinquent peer groups. Whereas males are more likely to exhibit physical aggression, stealing, vandalism, and school discipline problems, females display more relational than physical aggression, lying, substance use, running away, and prostitution. CD behaviours may result in injury, expulsion from school, Sexually

Transmitted Illnesses (STIs), unplanned pregnancy, and legal difficulties (APA, 2013).

Importantly, the DSM-5 warns of misdiagnosing CD in settings where patterns of disruptive behaviour are viewed as normative, such as in reaction to living in war zones or highly threatening environments (APA, 2013). These are important criteria, and they warrant further attention, as they could potentially include trauma victims' 'maladaptive' but necessary coping responses to threatening life conditions. As well, this caution offers further support for investigating internalizing and externalizing behaviours. Sellbom (2016) noted that offenders who report higher scores in externalizing behaviours are less likely to be recognized as being impacted by mental health problems or incompetent to stand trial; thus, a need for treatment may not be sufficiently recognized in those displaying deviant behaviours.

Further, victims of child maltreatment are at an increased risk of being involved with the criminal justice system. Asberg and Renk (2013) compared survivors of child sexual abuse who are attending college to those currently incarcerated to address potential factors that may contribute to their life circumstances. Data were obtained from 169 female detention centre residents and 420 Southern US college students. Of this sample, 66.0% and 35.5%, respectively, reported being a survivor of some form of child sexual abuse. Importantly, incarcerated survivors came from impoverished backgrounds, endured more severe sexual trauma (i.e., reoccurring trauma or polytrauma), multiple psychological symptoms, and endorsed more coping difficulties and problematic family functioning that included involvement with child protective services. Further, results of logistical regression indicated that more severe abuse, substance use, and an absence of social support were considered important risk factors for incarceration (Asberg & Renk, 2013). Thus, a noteworthy differentiation between the two groups of young women with similar trauma experiences appeared to be the availability of parental and social supports that constituted systemic resiliency.

Resilience

Resilience reflects the capacities that help individuals cope with ALEs and adjust to other life circumstances. According to the American Psychological Association, resilience is defined as the “process of adapting well in the face of adversity, trauma, tragedy, threats or even significant sources of stress” (APA, 2013). Early conceptualizations of resilience focused primarily on individual traits and behaviours as protective buffers and indicators of resilient functioning (Klika & Herrenkohl, 2013). More recent conceptualizations of resilience attend more to the ways in which resilience can be contextually and culturally dependent (Ungar, 2011). Sabina and Banyard (2015) outlined the challenges in conceptualizing and measuring resilience consistently across different reports. Thus, it is challenging to compare the various studies focused on resilience. Klika and Herrenkohl’s review (2013) showed that only a few longitudinal studies examined resilience over extended periods of development. Hence, only a very modest examination has been made regarding how patterns of resilience actually unfold and are sustained. However, some common themes have been identified. Klika and Herrenkohl (2013) reviewed developmental research on resilience in maltreated children, observing that there is now a consensus regarding how complex the phenomenon of resilience is. Sippel, Pietrzak, Charney, Mayes, and Southwick (2015) added that, although numerous demographic, psychosocial, and biological factors are associated with resilience, individual factors in isolation account for a relatively small portion of the overall variance.

For the purpose of the present study, and following consensus in the current literature, resilience is understood as a complex and systemic force, which is supported by Bronfenbrenner’s early declaration of the ecological theory of development (Bronfenbrenner, 1977). Bronfenbrenner's model stressed the societal embeddedness of the individual within different layers of proximity to the individual. Specifically, the microsystem encompasses

relationships and interactions a child has with his or her immediate surroundings that include family, peers, school, and neighbourhood. At this level, relationships have bi-directional influences, meaning that the child both influences and is influenced by structures within the microsystem. Indeed, connectedness to these microsystems is predictive of resilience over time (Klika & Herrenkohl, 2013). For instance, individual resiliency is thought to be dependent on systemic resilience, as stable role models and affectionate caregivers are found to predict individual resilience (Southwick & Charney, 2012).

Individual resiliency. Armstrong, Birnie-Lefcovitch, and Ungar (2005) revealed support for the importance of problem solving, positive attention, and openness to novel experiences as protective factors for individual resilience. Southwick and Charney (2012) identified strong positive emotions and optimism, physical health (e.g., fitness, nutrition, and sleep hygiene), and emotion regulation (e.g., delayed gratification and rapid stress recovery) as protective factors. Likewise, Shonk and Cicchetti (2001) highlighted that lower rates of self-regulation, frustration tolerance, compliance and attention seeking by middle childhood was associated with an increased risk for later behavioural problems and substance use. Sippel and colleagues (2015) added to the known psychological correlates with individual resilience, that included optimism, positive emotions, and attention to health and fitness (including self-care), cognitive flexibility and adaptability, an active problem-oriented style of coping and perseverance, a well-integrated moral code of behaviour, and dedication to a meaningful life purpose or cause. Likewise, biological systems, the sympathetic nervous system (SNS) and hypothalamic-pituitary-adrenocortical (HPA) system are extensively involved in resilience to stress (Sippel et al., 2015).

Flynn, Cicchetti, and Rogosch (2014) observed that child maltreatment predicted low self-worth through comparison to non-maltreated children and youth in a multi-wave investigation.

Crocker and Wolfe (2001) presented an operational definition of self-worth that built on James' assumptions about self-esteem. In the early development in the study of the self, William James believed that self-esteem fluctuates in response to successes and failures in domains in which an individual has staked their self-worth (James, 1890). Crocker and Wolfe (2001) postulated that people develop contingencies they seek to satisfy in pursuing a belief that they are people of worth with positive self-esteem. The terms self-worth and self-esteem are used interchangeably in this framework. Self-esteem is both a *fluctuating state* and a *constant trait*. Thus, fluctuations of state self-esteem may offer more direct consequences for behaviour. For example, attempts to cope with the negative affect that follows from threats to the self may lead to problematic behaviour (Crocker & Wolfe, 2001). Whereas low self-worth has been linked to increased instances of aggression and substance abuse (Crocker & Wolfe, 2001), strengthened feelings of self-worth through healthy attachment and positive peer relationships could act as a buffer against negative adjustment following child sexual trauma.

Systemic resiliency. Southwick and Charney (2012) identified strong social skills, diverse social networks, and resilient role models as protective factors for social resiliency.

Herrenkohl and colleagues (2016) cautioned, however, that the majority of research on social support and maltreatment is retrospective in nature; thus, current knowledge on systemic resiliency could be biased. Likewise, Herrenkohl and colleagues (2016) highlighted the complex association of individual and systemic factors, as victims of maltreatment often fail to develop strong, positive relationships due to both the violation of trust and boundaries. Thus, children with histories of trauma often cannot find substitute sources of security. This absence can lead to behaviours that are perceived as helpless, blaming, or rejecting (Cook et al., 2005), and often are misinterpreted as oppositional or antisocial (Van der Kolk et al., 2009). Similarly, many children

who suffer abuse live in unstable and unpredictable living situations, with removal from the child's home for safety concerns adding to the existing trauma (Herrenkohl et al., 2016).

Parental attachment. Armstrong and colleagues (2005) explained that protective factors at the familial level included consistent nurturing during the first year of life, alternative caretakers who step in when parents are not present, the age of the opposite-sex parent and a multi-age network of relatives, as well as having structure and rules during adolescence.

Further support for the importance of parental attachment comes from Arbona and Power (2003) who examined 1,583 Southern US high school students from six different high schools between the ages of 13-19. They reported that secure attachment with parents was associated with higher self-esteem and lower antisocial behaviour in all youth regardless of their countries of origin or identification.

Rahim (2014) posited that negative outcomes of trauma could be mediated by a child's attachment to their caregiver. According to Bowlby's framework, attachments between children and caretakers first form in infancy from the child's need for nurturance, comfort, and protection (Bowlby, 1968). Fulfillment of the child's needs, or the lack thereof, forms internal working models of the self and others in close relationships which impacts future relationships (Murphy, Elklit, Hyland, & Shevlin, 2016). Trauma perpetrated by caregivers holds the potential to significantly amplify negative outcomes. More specifically, secure attachment relationships decrease the severity of the outcomes of traumatic experiences, whereas insecure attachment relationships amplify adverse outcomes (Van der Kolk et al., 2009). Thibodeau, Lavoie, Hébert, and Blais (2017) noted an association between child maltreatment (i.e., sexual abuse, physical abuse, neglect, or witnessing domestic violence) and adolescent sexual risk behaviours (SRBs). Their sample comprised 1,900 sexually active adolescents who were 13 to 17 years of age, with the sample being primarily female (60.8% were female), and who were attending Quebec high

schools. The results of the path analyses indicated that neglect was associated with a higher number of sexual partners, casual sexual behaviour, and being younger at first intercourse. Importantly, anxious attachment mediated the relationship between neglect and the number of sexual partners, whereas avoidant attachment explained the relationship between neglect and the number of sexual partners, casual sexual behaviour, and age at first intercourse (for boys only). Sexual abuse was directly associated with all three SRBs. Neither anxious attachment nor avoidant attachment mediated these associations (Thibodeau et al., 2017).

Rahim (2014) further added that instances of coping with sexual trauma in which the perpetrator was a caregiver could be misinterpreted as oppositional or antisocial behaviour. Hébert, Daspe, and Cyr (2017) examined parental attachment as a predictor of recovery following sexual abuse. They assessed 505 children (339 girls) between six to 13 years of age in respect to perceived parental attachment security (with neither parent being a perpetrator of abuse) and coping strategies employed in relation to sexual abuse. Two types of coping, approach and avoiding, have been separately investigated. Approach coping is operationalized as reflecting more actionable strategies aimed at altering the stressful situation, whereas avoidance coping is understood as indirect responses or disengaged strategies aimed at avoiding or distancing oneself from the stressor and managing its emotional impact (Hébert et al., 2017). For both sexes, secure attachment was negatively associated with avoidant coping and the development of PTSD symptoms, and positively associated with self-esteem. Security to the same-sex parent was associated with higher self-esteem (i.e., self-worth); security to the opposite-sex parent was associated with both fewer PTSD symptomology and greater self-esteem. The researchers remarked that given males perpetrated the majority of child sexual abuse, it might be especially beneficial for victims to feel secure in a same-sex relationship as the perpetrator (Hébert et al., 2017).

Peer support. Burlaka, Bermann, and Graham-Bermann (2015) drew attention to the fact that children with internalizing behaviours (e.g., anxiety) may be hindered in their ability to form positive peer relationships. Thus, affected children might be more likely to rely on parental attachment. This could leave these children uniquely vulnerable to parental maltreatment. Adams, Santo, and Bukowski (2011) examined how having a best friend may buffer the effects of negative experiences in children. The researchers examined 103 Grade 5 and 6 students from Montreal, Canada, and examined how the presence of a best friend influenced global self-worth and stress reactions during exposure to a negative event. Over the course of four days, participants were asked to provide saliva samples and complete questionnaires regarding experiences that had occurred 20 minutes prior to the samples being taken. Without a best friend present, Adams and colleagues (2011) recorded significant increases of cortisol levels in students' saliva as well as decreases of global self-worth. The effects were reversed with a best friend present during the event, i.e. decreased cortisol and increased global self-worth. Thus, systemic resilience in the context of peer support, serves as a primary protector of a child's well-being and sense of self.

School involvement. School success is a broad predictor of positive outcomes reflected in lower levels of societal problems (e.g., welfare dependency, teenage pregnancy, and criminal behaviour), as well as work success in adulthood (Motti-Stenfanidi & Masten, 2013). Thus, academic achievement has been employed as a marker of resilience in maltreated children. Shonk and Cicchetti (2001) stressed that maltreated children commonly manifested multiple forms of academic risk and showed more externalizing and internalizing behavior problems. Importantly, the effects of maltreatment on academic maladjustment were partially mediated by academic engagement. Similarly, Williams, MacMillan, and Jamieson (2006) explored the beneficial effects of staying in school independent of (high) academic achievement. In a sample

of 6,681 victims of physical and sexual abuse from Ontario, Canada, remaining in school was associated with lower externalizing (but not internalizing) problems (Williams et al., 2006). Similarly, Lane (2014) examined 96 adolescents between 12-16 years old, with 65% identifying as Caucasian, from New Jersey middle and high schools. The participants had been screened to partake in a school-based depression prevention study. Results suggested that structural extracurricular activities (sports participation intensity, and duration of participation in leadership activities) were associated with lower parent-reported adolescent internalizing scores (Lane, 2014).

Hypotheses

The current study examined developmental trauma, specifically child and youth maltreatment, and its impact on internalizing (e.g., mood disturbances) and externalizing disorders (e.g., behavioural deviance). Of interest in predicting outcomes of maltreatment-ALEs are the nature and degree of individual and systemic resiliencies, which are hypothesized to serve as mediators to past maltreatment and future adjustment.

Based on the literature review and in the context of the major issues that are of current relevance, the following hypotheses form the focus of the proposed study:

Hypothesis 1

A history of any past form of maltreatment (neglect, sexual abuse, physical abuse, or witnessing domestic violence) will be characterized by higher scores on internalizing and/or externalizing behaviours in comparison to scores of the non-ALE contrast group.

Hypothesis 2

The non-ALE contrast group will show some resilience deficits and elevated internalizing and externalizing behaviours as a result of challenges that are exclusive of any form of past

maltreatment compared to a non-clinical sample of same-age children and youth. Yet, deficits will be expected to fall below the threshold of maltreated children and youth.

Hypothesis 3

Poly-victimization, that is, multiple types of maltreatment, will contribute to higher scores on internalizing and/or externalizing measures when compared to any single type of maltreatment.

Hypothesis 4

Younger children will display externalizing behaviours, whereas older children will display more internalizing behaviours.

Hypothesis 5

Males will exhibit higher scores on externalizing behaviours, whereas females will tend to exhibit high scores on internalizing behaviours.

Hypothesis 6

Resilience (both individual and systemic) will mediate the association between maltreatment and internalizing and externalizing behaviours.

Hypothesis 7

Higher scores on individual and/or systemic resilience will mediate the association between maltreatment and internalizing/externalizing behaviours as reflected in a significant interaction effect between individual and/or systemic resilience and internalizing/externalizing behaviours.

Hypothesis 8

There will be a weaker positive association between maltreatment and internalizing/externalizing behaviours amongst those with higher scores on resilience measures and a stronger association among those with weaker scores on resilience measures.

Method

Participants

Data for the present study were extracted from 9,002 cases based on the interRAI Child and Youth Mental Health instrument (ChYMH) that was collected between the years 2012-2017. The sample was drawn from child and adolescent cases that were seen at over 40 Ontario child and youth mental health centres by clinicians who were trained in the use of the interRAI ChYMH. For the present study, participants were selected via purposive sampling. The inclusion criteria involved all participants, with particular interest in those children and youth who reported one or more of the four types of maltreatment (i.e., sexual abuse, physical abuse, neglect, and witnessing domestic violence). No additional inclusion or exclusion criteria were applied to this purposive sample. The sample included male and female youth, from ages 4 through 18 years, in all possible family constellations.

Materials

The interRAI organization is a not-for-profit group comprised of expert clinicians and researchers drawn from across approximately 35 countries for the purpose of promoting evidence-informed clinical practice and policy decision making through the collection and interpretation of high-quality data (www.interRAI.org). The interRAI instruments comprise a suite of assessment tools with a plethora of applications that include care planning protocols; care planning guidelines; outcome measures using scales that evaluate present status or change over time in a specific clinical domain; quality indicators that are used as benchmarks for organizational effectiveness; and resource allocation indicators.

The interRAI instrument employed to assess the prospective sample was the interRAI Child and Youth Mental Health (ChYMH; Stewart et al., 2015). This is an assessment-to-intervention tool used in many mental health agencies across Ontario, Canada, for individuals

between four to 18 years of age. Rigorous reliability and validity studies have been conducted across the family of interRAI instruments. Strong psychometric properties are reported for children and youth measures (Stewart et al., 2015). Recent studies by Stewart and Hamza (2017) and Stewart, Poss, Thornley, and Hirdes (2019) reported strong internal consistency ratings for the ChYMH, and they also assessed inter-rater reliability of the interRAI instruments, identifying an average agreement of 83% for all interRAI mental health items.

The interRAI ChYMH consists of a core form that is completed for all children and youth, and an adolescent supplement that is completed for youth 12 years of age and older, or for those children 11 years of age and younger whose behaviours reflect indicators commonly seen in adolescence. The assessment forms enable a service provider to assess key domains of function, mental and physical health, social support, and service utilization. Particular items also identify those who could benefit from further evaluation of specific problems and risks for declines in health, well-being, or function. Children and youth with intellectual disabilities are assessed with the interRAI Child and Youth Mental Health– Developmental Disabilities Version (ChYMH-DD), which will not be included in the proposed analyses.

Demographics. As an assessment-to-intervention tool, the ChYMH collects demographic markers. Of interest for the current analyses are the age at intake, sex, and in-patient or out-patient status of the minor. To examine developmental patterns, the sample was compared within and across three age groups, including ages four to six (early childhood), seven to 11 (late childhood), and 12 to 18 (adolescence; Kaplow & Widom, 2007). Whereas age differences have been noted for internalizing and externalizing behaviours (Crijnen et al., 1997; Burlaka et al., 2014) and general impact of developmental trauma (Van der Kolk et al., 2009), there are inconsistent findings regarding sex differences and coping protocols (Achenbach, 1966; Gonzalez

et al., 2014). The issue of the relationship of sex to coping will be a partial focus of the current study.

Maltreatment. This study defined child and youth maltreatment as an act of harm against a minor. For purposes of comparison, the current sample also included those children and youth who did not report any experience with maltreatment along with those who experienced neglect, physical abuse, sexual abuse, and witnessing domestic violence. Maltreatment trauma was assessed with the ChYMH item recoding the specific type(s) of the ALE experienced.

Resilience. Following Bronfenbrenner's framework (1977), resilience was divided into individual and systemic categories, with the latter encompassing parental attachment, peer supports, and school involvement. Following from the current literature, one item was selected per resilience category to best represent the concept.

Individual resiliency was measured using the ChYMH item *adaptability*. This item was chosen from several similar items of self-worth and perseverance, including having a notable talent and consistent positive outlook, as well as the absence of self-depreciation, negative statements, or expressions of guilt or shame (Flynn et al., 2014; Sippel et al., 2015).

Parental attachment was assessed using the ChYMH item pertaining to *emotion regulation*. Other items that informed parenting included communication, disciplining, supervision, and support provided by caregivers, as well as comfort-seeking behaviours. Additional items that assessed the home environment contained severe failure to provide for basic needs, living arrangements prior to admission, and instances of removal from the home (Arbona & Power, 2003; Armstrong et al., 2005).

Peer support was recorded using the ChYMH item examining *regular socialization with at least one friend*. Similar items encompassed having a confidant, leading strong and supportive relationships with peers, not having antisocial peers or unsettled relationships with close friends

and peers, as well as social inclusion versus feelings of non-belonging (the latter being restricted to the ChYMH adolescent supplement; Adams et al., 2011).

School involvement was assessed using the ChYMH item pertaining to *school engagement*. Comparable items of interest included persistent dissatisfaction with school, disrupted education, involvement in extracurricular activities, and school performance (Lane, 2014; Motti-Stenfanidi & Masten, 2013; Williams et al., 2006).

Internalizing and externalizing behaviours. The variables in this section were informed by Achenbach's work (1966). *Internalizing behaviours* included symptoms or diagnoses of mood disorders, and other ChYMH items like mood disturbances (e.g., sad facial expressions, crying, decreased energy, labile and flat affect), anxiety items (e.g., hypervigilance, nightmares, episodes of panic), negative symptoms (e.g., withdrawal from hobbies and friends, lack of interest in social interactions, somatic symptoms), and behaviour patterns that hinder socialization (e.g., extreme shyness).

Similarly, *externalizing behaviours* were assessed using diagnoses or symptoms of disruptive behaviour disorders (e.g., CD, ODD), as well as ChYMH items of negative behaviour symptoms (e.g., verbal or physical abuse, outbursts of anger, or repetitive lying) and violence (e.g., ideation, threats, or acts against others).

Further, the adolescent supplement of the ChYMH offers insight into disordered eating and self-injurious behaviours, and changes to mood and sleep patterns, which formed part of the internalizing behaviours, as well as sexual activity (e.g., promiscuity, prostitution, sexual perpetration) and substance use, which characterized the externalizing behaviours.

Within the interRAI lab, scales for internalizing and externalizing behaviours were created from relevant interRAI items and approved with appropriate statistical testing. These

scales were utilized for the present study. Scores on the externalizing scale range from one to 12, whereas scores on the internalizing scale range from one to 48.

Procedure

Participant selection and subsequent use of data followed ethical guidelines as set out by the University of Western Ontario's ethics review board. Data were stored electronically on a password-protected computer, which does not utilize functional USB ports or access to the Internet and is maintained in a locked laboratory within the Faculty of Education. Cases and data were identified using a random Case Record Number to ensure confidentiality. Groups of individuals that represented less than 25 participants were not reported or disclosed. Data from the current study will be stored indefinitely for the purpose of further interRAI research.

The participating mental health centres have integrated the comprehensive and standardized interRAI ChYMH assessment as part of their standard of care. The ChYMH's semi-structured interview format allows for a comprehensive assessment, which takes approximately an hour to complete by trained clinical staff using all sources of information available. Sources of information include interviews with the individual (child, youth, or adult), family, clinical chart notes, clinical observation, and collateral contacts where possible (e.g., educators, mental health care clinicians).

Since the ChYMH is completed at first contact with each child or youth with a community agency (i.e., intake), this study utilized a cross-sectional design with age cohorts serving as a proxy for investigating the developmental nature of trauma. Both in - and out - patient data were included in the analyses. The selected sample was assessed on internalizing and externalizing behaviours. These behaviours were also examined in relation to individual and systemic resilience – four variables informed by the current literature were created by selecting appropriate comparative ChYMH items. A comparison group was established to weigh the

influence of other contributors (excluding adverse life events such as maltreatment) on the variables of interest.

The overarching goal of this study was to inform understanding regarding developmental traumatology and its effects on intervention and treatment programming (interRAI Clinical Assessment Protocols).

Results

The following analyses investigated developmental trauma in the context of potential coping challenges in the areas of externalizing and internalizing behaviours in children and youth who experienced maltreatment. In addition, resilience was explored in examining the potential to mediate the relationship between social support and past trauma.

Demographic Information

The acquired sample of interRAI ChYMH data collected between the years of 2012-2017 contained 9,002 participants. Of these participants, 58.3% were male, and 41.7% were female. The sample partially reflected the cultural diversity of Ontario although it was not representative of the overall demographics of the youth population of Ontario. Among the 5.9% of children and youth who identified as Indigenous, 389 participants were First Nations, 125 participants were Metis, and 20 were Inuit. Since the N for the Inuit subsample fell below the minimum threshold for analysis (which is N=25), this subgroup was eliminated from the analysis.

The ChYMH is performed with children and youth ranging in age from four to 18 years, and the sample was comprised of participants across the full potential age range. The mean age of the sample was 12 years, with 7.3% of participants in early childhood (four to six years of age), 36% of participants in late childhood (seven to 11 years), and 49.4% of participants in adolescence (12 to 18 years). Further, 92.7% of participants completed the ChYMH assessment as outpatients.

Of these 9,002 children and youth, 90% resided with a parent or primary caregiver prior to the assessment. The remaining 10% lived alone (.8%), and within this percentage of the subsample, with siblings or other relatives (3.2%), foster families (3.1%), or with other non-relatives (2.9%). For the majority of participants (56.2%), both parents held legal guardianship. The second-largest group (29%) was comprised of mothers holding full custody. Other less common custody arrangements included full custody held by fathers (4.1%), child protection agencies or public guardians (4.8%), as well as 52 youth being responsible for themselves (.1%). Residential instability within the past two years prior to the assessment was reflected in 9.9% of children and youth. Moreover 1,350 children and youth (15.1%) had a history of foster care placement, with 6.7% of participants having been placed with multiple foster homes.

Children and youth attend mental health services for various reasons. Among the current participants who completed the interRAI ChYMH between 2012-17, 28.4% were referred due to a threat or danger to themselves, and 27.7% due to a threat or danger to others. A smaller subsample of 5.7% presented with substance addiction or dependency, and 9.9% of children and youth were referred due to involvement in the youth justice system. Importantly, a majority of the sample (61%) presented with specific psychiatric symptoms, such as severe behaviour problems, depression, hallucinations, and medication side effects.

A majority of the sample did not report any maltreatment trauma. However, a significant number of children and youth had experienced a significant failure to provide for their child's basic needs. For instance, 15.9% of children and youth experienced emotional neglect (e.g., left in crib for prolonged periods); 11% had their basic physical needs unmet (e.g., inadequate winter clothing), and 12.7% had their basic safety needs unmet (e.g., left in a hot car). Neglect in the ChYMH is coded at the earliest occurrence in the child or youth's life, and a substantial majority of those exposed to neglect experienced these failures to provide for basic needs from as early as

zero to four years of age.

Almost one in five of these youth (18.5 %) experienced physical abuse (759 females and 902 males) and 10.2% of participants experienced sexual abuse (661 females and 259 males). Again, most incidents dated back to at least one year prior to the assessment. However, 32 children and youth faced sexual violence within the last 30 days. Further, 28.9% of participants witnessed domestic violence in their homes (1,099 females and 1,494 males). Whereas the events occurred at least one year prior to assessment for 27.7% of participants, approximately 100 children and youth witnessed domestic violence within the last 30 days prior to their assessment. Lastly, among the children and youth who reported incidences of any maltreatment trauma, 16.9% were able to identify that one or more of the traumatic experiences had invoked a sense of horror or intense fear in them.

Relationship Between the Type of Trauma, Age, Sex and Internalizing / Externalizing Disorders

A multivariate analysis of variance (MANOVA) was utilized to determine if the independent variables (i.e., type of trauma, age group, sex) had a significant relationship to the scales on internalizing and externalizing behaviours. Prior to conducting the MANOVA, assumption testing was performed. Box's test of equality of covariance matrices supported that the observed covariance matrices of the dependent variables were equal across groups ($p < .05$). Moreover, Levene's test of equality of error variances suggested that the error variance of the dependent variables was equal across groups ($p < .05$). Despite MANOVA being rather robust to heterogeneity of variances when there are equal sample sizes among groups, a stricter alpha level of .01 was adopted for evaluating pairwise comparisons in risk factors. As well, utilizing a clinical sample disallowed a normal distribution. However, these limitations were expected at the outset of the study and taken into account during the interpretation of results. To comply with statistical requirements for MANOVA, all independent variables were transformed into

categorical items. Pillai's trace was selected to interpret the MANOVA results, as it is considered to be among the most robust and powerful post hoc tests (Tabachnick & Fidell, 2013).

Descriptive Statistics

An investigation of means across different models of the independent variables revealed multiple trends for the dependent variables. First, those participants who did not report maltreatment trauma revealed increases in internalizing behaviours with age. Internalizing scores were higher for females. However, these participants did not show a similar linear relationship for externalizing scores. Externalizing scores peaked in late childhood and achieved lowest scores during adolescents, which was amplified for female participants.

Table 1. Analysis of variance: No maltreatment trauma

	M	SD
Internalizing Scale		
Young childhood		
Male	4.76	5.28
Female	5.24	5.65
Late Childhood		
Male	8.08	7.11
Female	8.17	7.12
Adolescence		
Male	9.27	7.83
Female	12.44	9.62
Externalizing Scale		
Young childhood		
Male	4.86	2.42
Female	4.16	2.60
Late Childhood		
Male	5.13	2.68
Female	4.36	2.70
Adolescence		
Male	4.22	3.03
Female	2.61	2.72

Second, across participants who reported maltreatment trauma, participants who experienced polytrauma rated higher in internalizing behaviours than those who experienced one type of trauma. Again, scores for externalizing behaviours did not follow a linear pattern. Rather, the peak in late childhood was maintained, and those who experienced polytrauma revealed lower scores than those who experienced one type of maltreatment trauma. Yet, externalizing scores for

participants who experienced one type of trauma were higher than those for participants who did not report maltreatment trauma.

Multivariate Effects

Main effects were observed between participants' externalizing and internalizing scores and the reported type of trauma experienced, their age group, as well as their respective sex. Children and youth significantly differed in internalizing and externalizing scores based on the nature of their traumatic life experiences, $F(4, 16006) = 41.28$ ($p < .001$); $V = .02$; partial $\eta^2 = .01$. As well, participants from different age groups varied in internalizing and externalizing scores, $F(4, 16006) = 114.68$ ($p < .001$); $V = .06$; partial $\eta^2 = .03$. Likewise, children and youth's internalizing and externalizing scores differed significantly by sex, $F(2, 8002) = 69.84$ ($p < .001$); $V = .02$; partial $\eta^2 = .02$. Multivariate effects further suggested significance regarding the interaction effect of trauma and age on internalizing and externalizing scores [$F(8, 16006) = 5.99$ ($p < .001$); $V = .01$; partial $\eta^2 = .003$], but not for the interaction of trauma and sex on internalizing and externalizing scores [$F(4, 16006) = 1.21$ ($p > .001$); $V = .001$; partial $\eta^2 < .001$].

Table 2. Analysis of variance: One type of maltreatment trauma

	M	SD
Internalizing Scale		
Young childhood		
Male	5.04	5.41
Female	6.00	6.08
Late Childhood		
Male	9.90	7.81
Female	10.89	9.61
Adolescence		
Male	10.59	8.54
Female	13.65	9.66
Externalizing Scale		
Young childhood		
Male	6.20	2.53
Female	5.21	2.23
Late Childhood		
Male	6.47	2.71
Female	5.35	2.80
Adolescence		
Male	5.78	3.22
Female	3.79	3.12

Between-Subjects Effects

The tests for between-subject effects examined the potential differentiation between internalizing and externalizing behaviours and the specified dependant variables. Previously observed main effects remained intact. A main effect was found between the type of trauma and internalizing, $F(2, 8003) = 9.29$ ($p < .001$); partial $\eta^2 = .002$, and externalizing behaviours, $F(2, 8003) = 81.63$ ($p < .0005$); partial $\eta^2 = .02$. Further, a main effect was supported between the participants' sex and internalizing [$F(1, 8003) = 10.37$ ($p = .001$); partial $\eta^2 = .001$] and externalizing behaviours [$F(1, 8003) = 110.74$ ($p < .001$); partial $\eta^2 = .01$]. Finally, a main effect existed between age and internalizing behaviours [$F(2, 8003) = 126.17$ ($p < .001$); partial $\eta^2 = .03$] and externalizing behaviours, respectively [$F(2, 8003) = 71.98$ ($p < .001$); partial $\eta^2 = .02$]. Of note was an interaction effect between trauma and age for externalizing behaviours $F(4, 8003) = 10.68$ ($p < .001$); partial $\eta^2 = .005$. As well, a three-way interaction across trauma, age, and sex approached significance for internalizing scores $F(4, 8003) = 2.31$ ($p = .056$); partial $\eta^2 = .001$.

Table 3. Analysis of variance: Two or more types of maltreatment trauma

	M	SD
Internalizing Scale		
Young childhood		
Male	6.69	5.84
Female	4.45	4.62
Late Childhood		
Male	9.96	7.94
Female	9.29	8.17
Adolescence		
Male	10.54	8.35
Female	15.04	10.68
Externalizing Scale		
Young childhood		
Male	5.77	2.22
Female	4.31	2.44
Late Childhood		
Male	6.94	2.67
Female	5.55	2.86
Adolescence		
Male	6.60	3.14
Female	4.99	3.28

Post Hoc Testing on Main Effect Findings

Internalizing scores were significantly different between children and youth who reported no maltreatment trauma and those who reported one or more types of maltreatment trauma ($p < .001$). Of note, internalizing scores were not significantly different between those participants who experienced a single type of trauma and those who reported poly trauma ($p > .001$).

Externalizing scores were significantly different between children and youth who reported no maltreatment trauma and those who reported one or more types of maltreatment trauma ($p < .001$). As well, externalizing scores were significantly different between those participants who experienced a single type of trauma and those who reported poly trauma ($p < .001$).

Internalizing scores were significantly different across all age groups ($p < .001$). Therefore, internalizing scores varied significantly between young childhood, late childhood, and adolescence, and vice versa. Likewise, externalizing scores were significantly different across age groups. However, young childhood and adolescence were slightly less different from another ($p = .015$) than young childhood and late childhood ($p = .002$) and adolescence and late childhood ($p < .001$). Similarly, externalizing ($p < .001$) and internalizing scores ($p = .001$) were significantly different between male and female respondents.

Further testing on interaction effects revealed that externalizing scores were significantly different for younger male children who did not report trauma and those who reported one type of trauma ($p = .001$) as well as those who experienced two or more types of trauma ($p = .025$). However, externalizing scores of young male children who experienced one type of trauma did not significantly differ from those who experienced two or more types of trauma ($p > .05$). Of note, young female children did not differ significantly in externalizing scores across trauma categories. Importantly, internalizing scores did not differ significantly across trauma categories for either young male or female children.

In late childhood, externalizing scores differed significantly between boys who reported no trauma versus one type of trauma ($p < .001$), and no trauma versus two or more types of trauma ($p < .001$). As well, the older boys' externalizing scores differed significantly between none and two or more types of trauma ($p = .024$). Externalizing scores of older girls were significantly different only between no trauma and any trauma. Internalizing scores of older boys differed significantly between no trauma and trauma ($p < .001$), but not between one type of trauma and multiple types of trauma. Among older girls, internalizing scores varied significantly between no trauma and one type of trauma ($p < .001$), but not between no trauma and multiple types of trauma. However, the difference between older girls' internalizing scores for one versus multiple types of trauma neared significance ($p = .067$).

In adolescence, externalizing scores were significantly different across all trauma categories for both male and female teenagers ($p < .001$). Internalizing scores were significantly different between no trauma and one ($p = .004$) or multiple types of trauma ($p = .003$), respectively. The difference between internalizing scores for one versus multiple types of trauma was not significant for adolescent males. Internalizing scores differed significantly for female adolescents. Of note, no trauma versus one type of trauma offered the least significant difference ($p = .006$), followed by one type of trauma versus multiple types of trauma ($p = .004$). The female adolescent's internalizing scores between no trauma and multiple types of trauma showed the highest significance ($p < .001$).

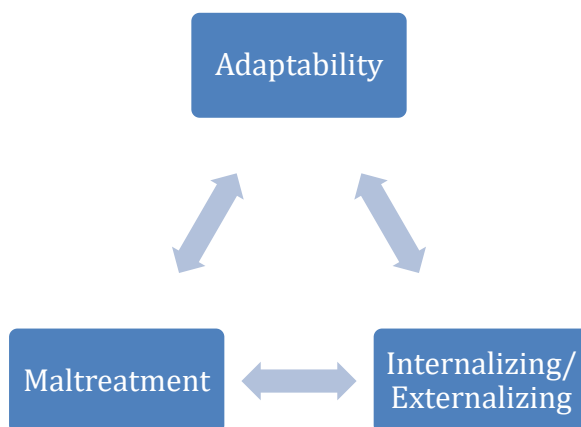
Mediation analysis

Individual resilience. A mediation analysis was performed to evaluate the extent to which individual resilience (i.e., adaptability) could mediate the relationship between trauma and externalizing behaviour. In Step-1, trauma was a significant predictor of externalizing behaviours, $t(8958) = 25.37, p < .001, \beta = .259$. In Step-2, trauma was not a significant predictor

of adaptability, $t(8963) = .526, p > .001, \beta = .006$. In Step-3, trauma and adaptability were regressed on externalizing behaviours, which generated a significant model, $F(2, 8957) = 785.12, p < .001, R^2 = .149$; both trauma ($t(8957) = 26.40, p < .001, \beta = .257$) and adaptability ($t(8957) = 29.40, p < .001, \beta = .287$) were significant predictors. Since $\beta_{c'} = .257 < \beta_c = .259$, and Sobel's Delta Method was significant ($z = 2.38, p < .05$), it was concluded that individual resilience mediated the relationship between trauma and externalizing behaviour.

Further, a second mediation analysis tested the potential extent of individual resilience to mediate the relationship between trauma and internalizing behaviour. In Step-1, trauma was a significant predictor of internalizing behaviours, $t(8019) = 109.53, p < .001, \beta = .116$. In Step-2, trauma was not a significant predictor of adaptability, $t(8962) = .529, p > .001, \beta = .006$. In Step-3, trauma and adaptability were regressed on internalizing behaviours, which generated a significant model, $F(2, 8018) = 150.44, p < .001, R^2 = .036$; both trauma ($t(8018) = 10.49, p < .001, \beta = .115$) and adaptability ($t(8018) = 13.74, p < .001, \beta = .151$) were significant predictors. Since $\beta_{c'} = .115 < \beta_c = .116$, and Sobel's Delta Method was significant ($z = 3.39, p < .05$), it was concluded that individual resilience was an incomplete but significant mediator of the relation between trauma and internalizing behaviour.

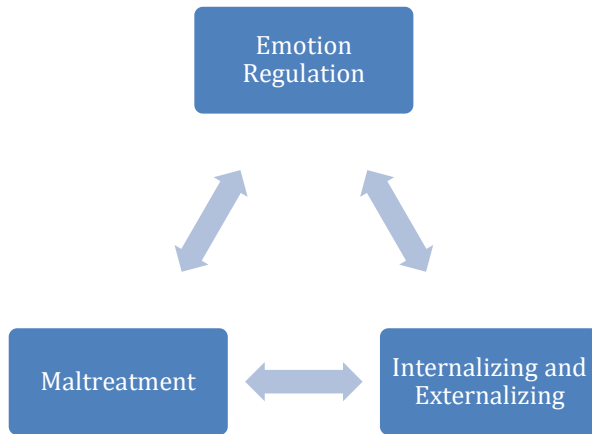
Figure 1. Mediation analysis: Individual resilience



Parental attachment. A mediation analysis was performed to evaluate the potential extent to which resilience by parenting (i.e., emotion regulation) could mediate the relationship between trauma and externalizing behaviours. In Step-1, trauma was a significant predictor of externalizing scores, $t(8958) = 25.37, p < .001, \beta = .259$. In Step-2, trauma was a significant predictor of emotion regulation, $t(8958) = 19.03, p < .001, \beta = .197$. In Step-3, trauma and emotion regulation were regressed on externalizing behaviours, which generated a significant model, $F(2, 8957) = 325.77, p = .007, R^2 = .068$; both trauma ($t(8957) = 24.35, p < .001, \beta = .253$) and emotion regulation ($t(8957) = 2.70, p = .007, \beta = .028$) were significant predictors. Since $\beta_{c'} = .253 < \beta_c = .259$, and Sobel's Delta Method was significant ($z = 3.76, p < .05$), it was concluded that resilience by parenting mediated the relation between trauma and externalizing behaviour.

Further, a second mediation analysis was performed to test if resilience by parents also mediated the relationship between trauma and internalizing behaviours. In Step-1, trauma was a significant predictor of internalizing behaviours, $t(8019) = 109.53, p < .001, \beta = .116$. In Step-2, trauma was a significant predictor of emotion regulation, $t(8958) = 19.03, p < .001, \beta = .197$. In Step-3, trauma and emotion regulation were regressed on internalizing behaviours, which generated a significant model, $F(2, 8018) = 68.52, p < .001, R^2 = .017$; both trauma ($t(8018) = 9.19, p < .001, \beta = .104$) and emotion regulation ($t(8018) = 5.21, p < .001, \beta = .059$) were significant predictors. Since $\beta_{c'} = .104 < \beta_c = .116$, and Sobel's Delta Method was significant ($z = 7.33, p < .05$), it was concluded that resilience by parenting was a significant mediator of the relation between trauma and internalizing behaviour.

Figure 2. Mediation analysis: Parental resilience

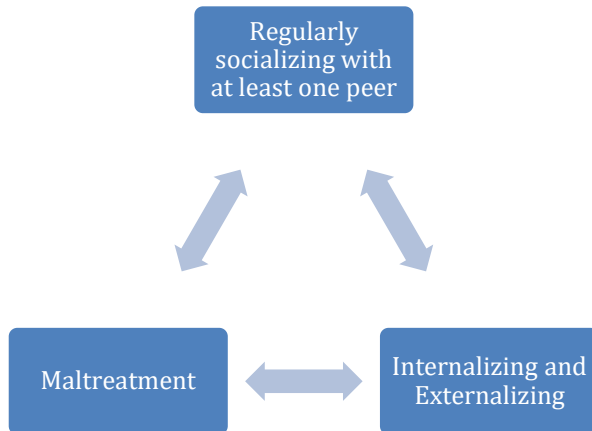


Peer resilience. Mediation analysis was performed to evaluate the potential extent to which peer resilience (i.e., regularly socializing with at least one peer) could mediate the relationship between trauma and externalizing behaviours. In Step-1, trauma was a significant predictor of externalizing scores, $t(8958) = 25.37, p < .001, \beta = .259$. In Step-2, trauma was a significant predictor of socializing, $t(8962) = -4.47, p < .001, \beta = -.047$. In Step-3, trauma and socializing were regressed on externalizing behaviours, which generated a significant model, $F(2, 8957) = 414.68, p < .001, R^2 = .085$; both trauma ($t(8957) = 24.96, p < .001, \beta = .253$) and socializing ($t(8957) = -13.16, p < .001, \beta = -.133$) were significant predictors. Since $\beta_{c'} = .253 < \beta_c = .259$, and Sobel's Delta Method was significant ($z = 6.82, p < .05$), it was concluded that peer resilience mediated the relation between trauma and externalizing behaviour.

Further, a second mediation analysis was performed to test if peer resilience also mediated the relationship between trauma and internalizing behaviours. In Step-1, trauma was a significant predictor of internalizing, $t(8019) = 109.53, p < .001, \beta = .116$. In Step-2, trauma was a significant predictor of socializing, $t(8962) = -4.47, p > .001, \beta = -.047$. In Step-3, trauma and socializing were regressed on internalizing behaviours, which generated a significant model, $F(2, 8018) = 69.85, p < .001, R^2 = .017$; both trauma ($t(8018) = 10.21, p < .001, \beta = .113$) and socializing ($t(8018) = -5.46, p < .001, \beta = -.060$) were significant predictors. Since $\beta_{c'} = .113 < \beta_c$

=.116, and Sobel's Delta Method was significant ($z = 2.90, p < .05$), it was concluded that peer resilience was a significant mediator of the relation between trauma and internalizing behaviour.

Figure 3. Mediation analysis: Peer support

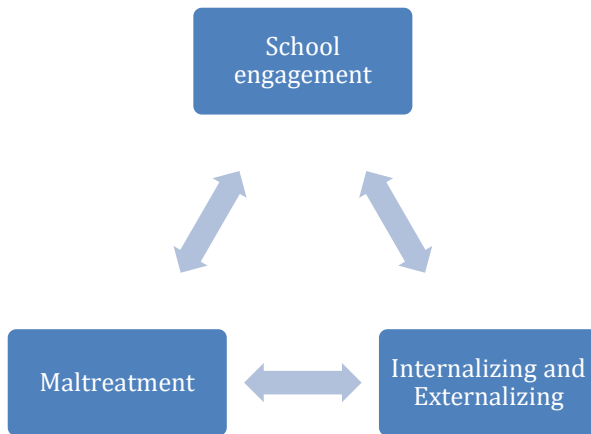


School engagement. A mediation analysis was performed to evaluate whether school resilience (i.e., school engagement) could mediate the relationship between trauma and externalizing behaviours. In Step-1, trauma was a significant predictor of externalizing, $t(8958) = 25.37, p < .001, \beta = .259$. In Step-2, trauma was a significant predictor of school engagement, $t(8961) = -4.25, p > .001, \beta = -.045$. In Step-3, trauma and school engagement were regressed on externalizing behaviours, which generated a significant model, $F(2, 8957) = 438.80, p < .001, R^2 = .089$; both trauma ($t(8957) = 26.99, p < .001, \beta = .252$) and school engagement ($t(8957) = -14.77, p < .001, \beta = -.149$) were significant predictors. Since $\beta_{c'} = .252 < \beta_c = .259$, and Sobel's Delta Method was significant ($z = 7.83, p < .05$), it was concluded that school resilience mediated the relation between trauma and externalizing behaviour.

A second mediation was performed to test if school resilience also mediated the relationship between trauma and internalizing behaviours. In Step-1, trauma was a significant predictor of internalizing behaviour, $t(8019) = 109.53, p < .001, \beta = .116$. In Step-2, trauma was a significant predictor of school engagement, $t(8961) = -4.25, p > .001, \beta = -.045$. In Step-3,

trauma and school engagement were regressed on internalizing behaviours, which generated a significant model, $F(2, 8018) = 76.66, p < .001, R^2 = .019$; both trauma ($t(8018) = 10.19, p < .001, \beta = .113$) and school engagement ($t(8018) = -6.57, p < .001, \beta = -.073$) were significant predictors. Since $\beta_c' = .113 < \beta_c = .116$, and Sobel's Delta Method was significant ($z = 3.66, p < .05$), it was concluded that school resilience was a significant mediator of the relation between trauma and internalizing behaviour.

Figure 4. Mediation analysis: School engagement



Summary of results

The demographic makeup of the sample revealed that participants included slightly more males than females. Further, younger children comprised the smallest age group. As well, most participants reported outpatient status. Hence, the reported results carry certain limitations, which will be addressed in a subsequent section regarding the limitations to the current study.

Type of trauma, age, and sex were related to participants' internalizing and externalizing scores. Specifically, a significant difference between no trauma and trauma was observed for internalizing scores, whereas externalizing scores were significantly different across all trauma categories. As well, both age and sex elicited differences in externalizing and internalizing scores. The interaction effects provided more insight into the sample. Of note, across younger

children, the presence of maltreatment trauma did not carry a significant impact on internalizing scores and female externalizing scores. Across later childhood, trauma impacted externalizing and internalizing scores for both male and female participants. Importantly, there were no significant differences in internalizing scores for older female children who had experienced none versus multiple types of trauma. In adolescence, trauma significantly impacted internalizing and externalizing scores for both sexes. Of note, differences in externalizing and externalizing scores between single versus multiple types were mostly observed in older participants.

Moreover, all four resilience variables (i.e., adaptability, emotion regulation, regularly socializing with at least one peer, and school engagement) mediated the relation between type of trauma and both internalizing and externalizing behaviours.

Discussion

The overarching goal of this study was to foster the current understanding of developmental traumatology and its implications for intervention and treatment. Hence, developmental trauma was investigated in the context of potential coping challenges in the areas of externalizing and internalizing behaviours in children and youth who experienced maltreatment. In addition, resilience was explored in examining its potential to mediate the relationship between social support and past trauma.

The majority of the hypotheses were supported. However, some deviations were detected across trauma, sex, and age groups. The data supported that internalizing and externalizing scores generally differed between the maltreatment group and non-ALE contrast group, as well as between a single type of trauma and polytrauma. These findings suggested that those who experienced maltreatment trauma carry higher internalizing and externalizing scores than those who did not have traumatizing experiences. However, across early childhood, the presence of maltreatment trauma did not significantly impact externalizing and internalizing scores.

Polytrauma amplified the effect of ALEs on coping responses for most groups, with the exception of older female children and male adolescents (internalizing only). The hypotheses failed to consider variations due to interaction effects. In accordance with hypotheses four and five, externalizing scores were highest among children, and internalizing scores were highest in adolescents. However, whereas internalizing behaviours increased with age in a linear fashion, externalizing scores peaked in late childhood and hereafter decreased within adolescence. Lastly, hypotheses six and seven were supported: all four resilience variables (i.e., adaptability, emotion regulation, regularly socializing with at least one peer, and school engagement) mediated the relationship between the type of trauma and both internalizing and externalizing behaviours. These findings suggest that capitalizing on children and youth's resiliencies may be the key to enhancing trauma-informed care.

Relevance to Previous Research

The observed sex and age differences in internalizing and externalizing profiles replicated findings from a global comparison analysis reported by Crijnen, Achenbach, and Verhulst (1997). Internalizing scores were highest among female youth, and externalizing scores peaked in male late childhood. Moreover, the present findings replicated emerging interRAI research on the impact of poly-victimization as carrying greater implications than single types of trauma (Leschied, personal communication, December 8, 2017). Internalizing and externalizing scores differed significantly between single types of trauma and poly-trauma across most sex and age groups.

In accordance with the existing literature, resilience variables in isolation accounted for relatively small portions of the variance (Sippel et al., 2015). However, the literature, guided by Bronfenbrenner, further supported the interconnectedness of resilience dimensions: if a child or youth lacked parental resilience factors, they were likely to lack peer and individual resiliencies

as well (Klika & Herrenkohl, 2013; Southwick & Charney, 2012). Since maltreatment trauma is commonly perpetrated by a primary caregiver or those in close proximity to the child or youth, it is challenging to consider from which source survivors of maltreatment learn resilience. Shonk and Cicchetti (2001) noted that a lack of individual resilience by middle childhood was associated with externalizing behaviours. This connectedness might suggest that deficiencies in one dimension of resilience could predict shortcomings across other resilience dimensions.

Following Bowlby's model of attachment theory, several researchers reported on the importance of parental attachment for the well-being of children and youth. For instance, parental attachment was recognized as a primary protective factor following a traumatic life experience (Hébert et al., 2017). However, abuse that is perpetrated by a caretaker violates a child or youth's feelings of safety and trust. Gauthier-Duchesne and colleagues (2017) observed that the closeness of the perpetrator's relationship to the minor predicted externalizing problems. This effect is likely amplified if the perpetrator continues to serve as a primary caretaker. Although approximately 15% of participants in the present study experienced a foster care placement, parents held custody over a majority of the participants. Those children and youth who are prevented from re-establishing positive relationships with caregivers are more likely to apply avoidance coping strategies, consisting of disengaging and distancing the self (i.e., internalizing behaviours; Hébert et al., 2017). Unquestionably, these violations of trust prevent healing (Herrenkohl et al., 2016). Importantly, the mistrust displayed by children and youth who experienced maltreatment trauma is frequently given later expression through externalizing and at times deviant behaviour (Cook et al., 2005). Hence, establishing positive attachments, or at least positive relationships with teachers, mentors, or caseworkers may offer additional benefits, particularly if the positive role model shares the same sex as the perpetrator.

Similarly, peers can offer opportunities for positive attachment, though the child or youth's ability to form peer relationships may be impacted from a lack of parental attachment (Klika & Herrenkohl, 2013; Southwick & Charney, 2012). Moreover, those children or youth high in internalizing behaviours might experience further difficulties in forming friendships and become increasingly reliant on parental attachment, which may signify additional vulnerability to maltreatment (Adams et al., 2011; Burlaka et al., 2015). Adams and colleagues observed that the presence of a best friend positively impacted self-worth and stress reactions (measured via saliva testing) during exposure to negative events (2011). Thus, the presence of a peer could potentially regulate flight, fight, or freeze responses in trauma survivors.

Further, Asberg and Renk (2013) demonstrated that the differences between inmates and college students who experienced childhood maltreatment trauma rested in their environments, which encompassed factors such as family functioning, socioeconomic status, social support and coping responses. Hence, it is plausible that these incarcerated survivors of trauma could have become college students, had they received the appropriate supports. Externalizing disorders, which have been linked to involvement with the criminal justice system (Van der Kolk et al., 2009), peaked in late childhood and were found to be higher amongst those who experienced maltreatment trauma. As well, the DSM-5 cautioned that externalizing behaviours are routinely perceived to relate to conduct disorder and are associated with a child or youth's conscious decision to act in a deviant fashion (APA, 2013). Hence, these children and youth are less likely to be recognized as needing support. In particular, offenders who report heightened externalizing scores were less likely to be recognized as being impacted by a mental health concern or as incompetent to stand trial (Sellbom, 2016). Unfortunately, the rehabilitative capacities of correctional facilities are limited, which prevents the opportunity to implement trauma-informed care. According to trauma expert, Gabor Maté, survivors of trauma often use substances to soothe

their pain (2009). Substance use is commonly punished by schools and the criminal justice system rather than taken as an indicator for trauma-informed care. Importantly, educational settings – engagement to which was found to mediate the impact of trauma – as a system may be inclined to dismiss children or youth who disrupt learning, are unable focus, or absence themselves from class as being defiant. Close to two decades ago, Shonk and Cinchetti (2001) suggested that the effects of maltreatment on academic maladjustment were partially mediated by academic engagement. In the present analysis, school engagement fully mediated the relationship between maltreatment trauma and internalizing/externalizing behaviours.

Rahim (2014) explained that children and youth who experience trauma remain in a state of hyperarousal in an effort to maintain safety. Specifically, the sympathetic nervous system remains active to elicit a fight, flight, or freeze response to perceived danger (Rahim, 2014; Sippel et al., 2015). This may translate into emotion dysregulation, anger outbursts, the inability to focus or feel safe in a classroom setting, and withdrawal from authority figures and social interactions. Achenbach (1966) understood internalizing behaviours as a presenting problem within the self; thus, children who display these symptoms are frequently overlooked. In fact, Achenbach's work supported the finding that those children or youth who rank higher in internalizing behaviours were more likely to perform better at school and display fewer problems in social settings. Therefore, internalizing and externalizing symptoms are on opposite extremes: internalizing symptoms are dismissed because they are overlooked; externalizing behaviours are dismissed because these children or youth are labelled as deviant. At the same time, Achenbach (1966) cautioned to form directional assumptions about the presence of symptoms. A child or youth higher in externalizing behaviours may not necessarily be lower in internalizing symptoms. Rather, internalizing behaviours are outwardly symptoms and internalizing behaviours are inwardly focused.

Beyond childhood and youth and into adulthood, the lasting effects of maltreatment trauma can linger and present as illicit substance use and/or alcoholism, as well as increased risk of re-victimization in adulthood (Burczycka, 2015). Further, additional resources for mental and physical health support are required to mitigate the long-lasting impact of childhood maltreatment trauma. Moreover, additional lives could be impacted via intergenerational trauma as a consequence of genetic transmission and the fact that the prospective parents are unlikely to have observed positive parenting in their childhood (Van der Kolk et al., 2009).

Implications

Research has supported that most children who experienced a traumatic life experience are able to move forward without suffering lasting effects; however, a significant number of children carry away life-long implications. Unfortunately, researchers and clinicians alike cannot effectively stop maltreatment trauma from occurring to minimize potential harm to children and youth. However, efforts that have been undertaken and can be strengthened by the findings of the present study are programming initiatives to support survivors of childhood maltreatment. For instance, child and youth mental health centres across Ontario employ the ChYMH to assess need for and initiate evidence-based care planning.

Children and youth who reported maltreatment trauma showed enhanced internalizing and externalizing scores compared to those in the non-maltreatment condition. This supports that heightened scores across these behaviours might be useful in predicting a need for trauma-informed interventions. In fact, the societal understanding of withdrawn or rebellious youth might in fact be rooted in traumatic life experiences. It is likely that those anti-social, withdrawn students or the undisciplined ‘trouble makers’ act out of fear for their own safety. Rather than trying to cause ‘trouble,’ these children and youth might be led by their sympathetic nervous system and learned behaviours in an effort to keep safe from future danger.

Since most maltreatment trauma occurs at home, schools offer an avenue for intervention. However, the existing literature supported that trauma responses are frequently overlooked or punished. If left without support, survivors of maltreatment trauma can suffer life-long psychological and physical damage. If expelled, these children and youths' futures are further compromised. As well, being unable to attend school can eliminate a safe space from a young persons' life. Indeed, educational institutions are not only a place of learning but also a platform for social interactions. Youth who experienced maltreatment trauma could benefit from positive interactions with peers and authority figures. For instance, these social interactions can provide information about healthy boundaries. Since both school engagement and peer support mediated coping protocols following maltreatment trauma, efforts to strengthen these resilience factors should be undertaken at the community level.

Lawmakers might want to consider the financial implications of neglecting to support these young people. Those individuals with high internalizing disorders may encounter somatic concerns which are likely to receive medical attention. As well, those minors with dominant externalizing behaviours might have frequent yet preventable encounters with the criminal justice system. Likewise, these children and youth may carry their traumatic experiences well into adulthood, which can be observed in services accessed for physical and mental health support.

The present study carried important implications for trauma screening. Importantly, a requirement of screening includes awareness among those who are in contact with the child or youth in question. Of note, awareness is needed among educators and law enforcement to reframe externalizing behaviours as potential markers of maltreatment trauma. In particular, symptoms of internalizing behaviours are easily overlooked; however, educators and caretakers may observe withdrawal from social interactions in their dependants. As well, family doctors and school

nurses might be able to investigate somatic complaints. Hence, screening for maladaptive coping responses to maltreatment trauma should be approached as a team effort.

Further, the present study carried implications at the policy level. In order to enable enhanced trauma screening, community members require additional training in trauma-informed care. It may be beneficial to invest into locations that children and youth commonly frequent, such as schools and recreational services. It is important to note that the sole burden of trauma screening should not be placed on teachers alone. Following efforts to raise awareness and facilitate screening, trauma-informed interventions could be guided by the results of the present mediation analysis. Specifically, providing children and youth with opportunities to practice adaptability to change and emotion regulation, as well as to foster peer interactions and school engagement can improve coping responses. It may be worthwhile to consider if these resiliencies could be implemented into curricula and recreational programming, as well as into parenting courses.

Importantly, researchers and clinicians alike have pointed out for quite some time the inaction regarding the occurrence and handling of maltreatment trauma. Consequently, children and youth are prevented from accessing appropriate services, achieving their full potential (academic or otherwise), and are more likely to become involved with the criminal justice system. Indeed, a suggestion to enhance screening and intervention efforts has already been put forth approximately a decade ago. Van der Kolk's proposition of the diagnostic classification of *developmental trauma disorder* would provide threefold benefits to survivors of childhood maltreatment trauma, including raising awareness of its prevalence and common symptoms, preventing misdiagnosis and barriers to services, and guiding trauma-informed interventions. Immediate intervention is vital to the well-being of children and youth impacted by maltreatment

trauma. Delayed intervention or absence thereof may lead to revictimization, risk of intergenerational trauma, and significant costs for lifetime mental and physical health support.

Limitations and Future Directions

Utilizing a clinical sample carried several statistical limitations. Of note, the skewed distribution violated several statistical assumptions of analyses and lowered the confidence in the generalizability of the reported findings. However, the large sample size increased statistical power. A MANOVA was employed in the primary analysis to enhance the accuracy of results. Specifically, the large sample size and MANOVA's robustness to violations of normal distribution increased confidence in the present findings. Additional testing served to confirm results of the mediation analysis. Future replications should be produced to mitigate the present limitations.

Further limitations were observed across the clinical sample. Importantly, only the responses of those children and youth who sought out services (via self- or other-referral) were recorded. Thus, the results generated in this report may not accurately portray the full range of coping protocols following childhood maltreatment trauma. Particularly since maltreatment trauma is commonly perpetrated by a primary caregiver (e.g., parents), some of these children and youth may be less likely to be brought into a mental health centre for support. As well, children and youth whose functioning is more impaired might be more likely to have dropped out of school and be in conflict with the law, thus pre-empting a need for being recognized as requiring mental health support. In contrast, children and youth whose coping responses did not meet observable thresholds may not have presented at a mental health centre and thus assessed on the interRAI ChYMH.

Further, the sample contained slightly fewer females than males. Moreover, younger children comprised the smallest age group. Hence, inferences made from the analyses should take

into account these restrictions. Additionally, the sample necessitated a cross-sectional design; hence, interpretations about age differences and developmental differences were made by proxy. Researchers wishing to replicate these findings might select a longitudinal design. Due to the fact that longitudinal designs require more resources (e.g., duration and cost of study), researchers might elect to compare internalizing and externalizing scores at intake and post-intervention, as well as to measure the presence of resilience variables that were found to mediate maltreatment trauma at pre- and post-treatment.

Moreover, the existing literature revealed a lack of understanding and agreement regarding the definition of resilience (Sabina & Banyard, 2015). It is advised that a mediation analysis is performed once a greater understanding of resilience is achieved. In the meantime, researchers could employ factor analysis to identify a resilience factor (across interRAI resilience variables) prior to performing a mediation analysis. Similarly, the literature suggested that minority groups have fewer resiliencies and are more likely to experience trauma. This vulnerable population includes people of colour, Indigenous peoples, immigrants and refugees, and members of the LGBT2SQ+ community.

Additionally, some results require further testing through future research. Although statistically significant differences were detected across types of trauma, some sex and age groups did not differ significantly in internalizing and externalizing scores. Though trauma did not appear to be reflected in internalizing and externalizing scores in younger children in the current sample, it is important to consider that younger children comprised the smallest sample size within the age group. However, it is possible that younger children's responses to ALEs were not sufficiently reflected in the internalizing and externalizing behaviours. Alternatively, coping responses may build up to detectable levels over time. As well, due to the developmental level of respondents, recorded answers might have been provided predominantly by caretakers.

The younger children's inability to self-report, resulting in dependency on care providers and other service providers, may affect interRAI results. Additionally, some sex and age groups showed no difference in internalizing and externalizing scores between no maltreatment trauma and polytrauma. It may be possible that these participants learned to adjust to these experiences with a certain degree of success, i.e. with resilience. However, since significant differences were recorded for one type of trauma, it may be possible that those participants who experienced polyvictimization responded by shutting down and submitting to their experience. This phenomenon warrants particular attention, as it challenges assessors in developing a clear picture regarding how these children and youth are coping and thus what services may be required.

In the current study design, the differences across the specific types of trauma (e.g., physical versus sexual abuse, etc.) were not investigated. The current literature suggests that there are more severe implications in coping for victims of sexual trauma (Rahim, 2014; Van der Kolk et al., 2009). Similarly, self-worth could not be investigated in the present study. An investigation by Flynn and colleagues (2014) supported that childhood maltreatment predicted low self-worth. Thus, it would be beneficial to understand if decreases in self-worth can explain similar scores between no trauma and polytrauma. Again, a plausible explanation relates to learned behaviour (e.g., accepting violence as normal relational behaviours after bearing witness to reoccurring domestic violence between caregivers). Survivors of trauma might internalize that they are deserving of their experience, which could have the effect of suppressing detectable coping responses (i.e., internalizing and externalizing behaviours) and thereby increasing the likelihood of future victimization. Should researchers find support for this hypothesis, these affected children and youth are particularly at risk. Since their internalizing and externalizing scores would not suggest traumatic experiences, these children and youth could be overlooked by service providers if they do not disclose their traumatic experiences.

Lastly, the results presented in the current study are limited to the population of Ontario. Researchers are encouraged to establish comparisons across a range of geographic regions. Though the present sample may not generalize to other Canadian provinces, Ontario comprises 40% of the Canadian population which makes the current sample an important contribution to the overall picture of Canadian childhood maltreatment trauma.

Conclusion

Traumatic life experiences can significantly influence normative childhood development. Specifically, trauma resulting from maltreatment (i.e., neglect, sexual abuse, physical abuse, and witnessing domestic violence) can amplify negative effects of trauma, as these events often include violations of boundaries and trust by caretakers. The current study examined child and youth maltreatment and its impact on internalizing (e.g., mood disturbances) and externalizing disorders (e.g., behavioural deviance). The sample investigated 9,002 participants who were assessed between the years of 2012-2017 on the interRAI Child and Youth Mental Health instrument (ChYMH). The ChYMH is a standard of care intake assessment used in many mental health agencies across Ontario, Canada, for individuals between four to 18 years of age.

Significant differences in internalizing and externalizing scores were detected across the three trauma groups (no maltreatment, one type of maltreatment trauma, and polytrauma) with some deviations across sex and age groups. Further, individual and systemic forms of resiliency were of interest in predicting outcomes of maltreatment and were found to mediate the relationship between maltreatment trauma and internalizing and externalizing behaviours.

These results provided further evidence for the necessity of enhancing trauma-informed care, including implementation of the diagnostic label of *developmental trauma disorder* to increase awareness at the community level, adequately capture those affected, and initiate important changes across screening and policy, as well as guide interventions. Though several

study limitations were noted, the results of the present investigation and existing literature offer promising insights into avenues for future research into childhood maltreatment trauma and resilience.

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Appendix A

Ethics approval to use interRAI ChYMH



Tuesday May 1, 2018

RE: Rebecca Pschibul

Ethics Approval to Use InterRAI CHYM

Thesis Title: The Impact of Maltreatment on Children and Youth: Exploring the Potential Mediating Effects of Resilience to Traumatic Life Events

Rebecca is involved in the interRAI line of research that draws on the data base established through Dr. Shannon Stewart of Western. This research has been approved through Western's REB. Rebecca does not have to access the REB as the broad ethics approval covers the work that Rebecca will be completing for her thesis in analyzing the secondary data set.

Respectfully,

Alan Leschied, PhD., C. Psych

Appendix B

Curriculum Vitae

Name: Rebecca Pschibul

Post-Secondary Education: M.A. Counselling Psychology
Western University
London, Ontario, Canada
2017-2019

B.A. (Honours) Psychology
University of Windsor
Windsor, Ontario, Canada
2013-2017

Related Clinical Experience: Counselling Intern
Psychological Services
Western University
2018-2019

Volunteer
John Howard Society

- Co-facilitator for low-income boy's group
- Bail office assistant

2017-2018

Court Accompany
Victim/Witness Assistance Program
Windsor Courthouse

- Provided support and information to victims and witnesses of crimes (e.g., domestic violence)

2014-2017

Related Research Experience: Research Assistant
Western University

- Conducted literature reviews in trauma-informed care
- Assisted with interRAI learning modules for community agencies

2017-2019