IMPAIRMENT IN YOUNG ADULTS ASSOCIATED WITH CHILD MALTREATMENT

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IMPAIRMENT IN YOUNG ADULTS ASSOCIATED WITH CHILD MALTREATMENT



Impairment in young adults associated with child maltreatment

by

Masako Tanaka

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in partial fulfillment of the requirements for the

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Abstract

Although research in the past two decades has provided information about the distribution and determinants of child maltreatment, as well as associated impairment in mental and physical health, little is known about the social functioning of maltreated youth during the transition to adulthood. As well, methodological challenges in conducting child maltreatment research, such as ethical and legal barriers to asking youth about such exposure has limited the advancement of new knowledge in this field.

This thesis investigated three key areas in the child maltreatment field. The first paper explored the psychometric properties of a self-report measure of child maltreatment (Childhood Experiences of Violence Questionnaire Short Form: CEVQ-SF). The second paper examined the possible association between exposure to child physical and sexual abuse and labour force outcomes among young adults using a community-based sample (Ontario Child Health Study: OCHS). The third paper considered an important methodologic question that commonly is raised when considering the relevance of cross-sectional versus longitudinal designs in child maltreatment research - the robustness of associations between exposure to child maltreatment and adult health outcomes, depending on design.

Results of this thesis showed that: 1) the CEVQ-SF is a reliable and valid approach to measuring child physical and sexual abuse; results were comparable

iii

to the validated original version, 2) in the OCHS sample, there was a significant association between child abuse with personal income; these associations were not fully explained by childhood variables, current mental and physical health, and educational attainment, 3) the estimates of the association between child maltreatment and adult health outcomes did not systematically differ by study design, and furthermore, the timing of measuring self-report of child maltreatment and adult outcomes did not systematically influence the magnitude of these associations within the cohort.

The research conducted for this thesis provides further support for a possible link between child maltreatment and reduced economic productivity and identifies a potential new mechanism. Results also suggest that the impact of child maltreatment on adult emotional and behavioural outcomes is independent of study design, but there is still the need for a universal definition and standard approaches to measuring child maltreatment in exploring this finding further.

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My sincere thanks also go to Dr. Christine Wekerle, the Principal Investigator of the Maltreatment and Adolescent Pathways project (MAP), for kindly offering the data for my thesis project. I also wish to thank Dr. David

v

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Table of Contents

Title page		
Abstract		
Acknowledgements		
Table of contents		
List of Tables		
List of Figures		
List of Appendixes		
List of Abbr	eviations	xiii
1 Chapter	1. Introduction	1
1. Chapter	ement of purpose	1
1.2 Definition		
1.2. Den	Physical abuse	8
1.2.1	Sexual abuse	9
1.2.3	Emotional abuse	10
1.2.4	Neglect	11
1.3. Mea	surement of child maltreatment	11
1.3.1	Child Protective Services official report	12
1.3.2	Retrospective self-report	13
1.4. Dist	ribution	13
1.4.1	. Incidence	13
1.4.2	. Prevalence	14
1.4.3	. Severity of maltreatment	16
1.4.4	. Multiple types of maltreatment	17
1.5. Dete	erminants	18
1.5.1	. Definition of risk factor	18
1.5.2	. Risk indicator	18
1.5.3	. Perpetrator	21
1.6. Consequences		22
1.6.1	. Mental health	22
1.6.2	Physical health	25
1.6.3	. Aggression and violence	28
1.6.4	. Cost	29
1.6.5	. Education	30
1.6.6	. Employment	32
1.7. Mechanism		33
1.7.1	. Developmental traumatology	33
1.7.2	. Resilience	33
1.8. Met	hodological issues	34
1.8.1	. Ethical considerations	34
1.8.2	2. Recall	35
1.8.3	. Shared variance	40

PhD Thesis M. Tanaka, McMaster – Health Research Methodology

100.000

	1.8.4. Study design	40	
	1.8.5. Confounders	41	
	1.9. References	44	
2	Chapter 2: Proliminary Evolution of the Childhood Experiences of V	iolonco	
2.	Chapter 2. Freinmary Evaluation of the Childhood Experiences of V	56	
	Questionnale Short Form (Study 1)	74	
	2.1. Tables	74 91	
	2.2. References	01	
3.	Chapter 3: The association between child abuse and labour force outcomes in		
	young adults: Results from the Ontario Child Health Study (Study 2)	83	
	3.1. Figures and Tables	108	
	3.2. References	120	
1	Chapter 4: Child abuse and emotional and behavioural outcomes in young		
4.	adulte: How do methods affect this association? (Study 3)	125	
	4.1 Figures and Tables	151	
	4.2 Appendix		
	4.3. References	170	
		110	
5.	Chapter 5: Conclusion and discussion	174	
	5.1. Major findings and implications	174	
	5.1.1. Study 1	174	
	5.1.2. Study 2	177	
	5.1.3. Study 3	179	
	5.2. Direction for future work	183	
	5.2.1. Definition and measurement	183	
	5.2.2. Risk factors and intervention	184	
	5.2.3. Gender and sex difference	185	
	5.2.4. Economic productivity in transition to young adulthood	186	
	5.3. References	189	
A	ppendixes	193	
_			

List of Tables

Chapter 2

- Table 1: Items and Minimum Required Frequency for Physical and Sexual Abuse and the Severe Forms Measured by the CEVQ and the CEVQ-SF
- Table 2: The Lifetime Prevalence of Maltreatment Type Measured by the CEVQ, CEVQ-SF, and CTQ
- Table 3: Two-Week Test-Retest Reliability Kappa Coefficient for Classification for Physical and Sexual Abuse and Severe Forms of Abuse Measured by the CEVQ and the CEVQ-SF
- Table 4: Agreement on Classification for Physical and Sexual Abuse and Severe Forms of Abuse between the CEVQ, CEVQ-SF, and CTQ
- Table 5: Odds Ratio of Meeting Clinical Level of Trauma Symptoms of Youth Grouped by Abuse Type in the CEVQ, CEVQ-SF, CTQ
- Table 6: Odds Ratio of Meeting Clinical Level of Trauma Symptoms of Youth Grouped by Multiple Abuse Type in the CEVQ, CEVQ-SF, CTQ

Chapter 3

- Table 1: Multivariate Analysis of Variance (MANOVA) and Effect Size for Physical Abuse
- Table 2: Multivariate Analysis of Variance (MANOVA) and Effect Size for Sexual Abuse
- Table 3: Bivariate Associations between Measured Variables
- Table 4: Associations between Abuse and Hypothesized Mediators (A) and Associations between Mediators and Outcomes (B) Controlled for Demographic and Childhood Variables
- Table 5: Multilevel Multiple Regression of Personal Income (log) on Child Abuse among Young Adults Who Were Employed in The Previous Year
- Table 6: Multilevel Multiple Logistic Regression of Employment (binary) on Child Abuse

Chapter 4

- Table 1: Analyzed Studies
- Table 2: Sample Characteristics
- Table 3: Pearson Correlation Coefficients between Child Abuse and Individual Variables
- Table 4: Unadjusted and Adjusted Odds Ratios of Having Major Depressive Disorder in Young Adulthood among Those with Child Physical and Sexual Abuse

- Table 5: Unadjusted and Adjusted Odds Ratios of Having Substance Dependence in Young Adulthood among Those with Child Physical and Sexual Abuse
- Table 6: Unadjusted and Adjusted Odds Ratios of Having Daily Smoking inYoung Adulthood among Those with Child Physical and Sexual Abuse
- Table 7: Unadjusted and Adjusted Odds Ratios of Having Major Depressive Disorders at Age of 21 among Those with Child Physical and Sexual Abuse Measured at Aged 18 and 21 (CHDS)
- Table 8: Unadjusted and Adjusted Odds Ratios of Having Substance Dependence at Age of 21 among Those with Child Physical and Sexual Abuse Measured at Aged 18 and 21 (CHDS)
- Table 9: Unadjusted and Adjusted Odds Ratios of Having Daily Smoking at Age of 21 among Those with Child Physical and Sexual Abuse Measured at Aged 18 and 21 (CHDS)

List of Figures

Chapter 3

Figure 1: Hypothesized Mediating Model

Figure 2: Proportion of Sample with or without Child Abuse by Sex

Chapter 4

- Figure 1: Unadjusted and Adjusted Odds Ratios of Having Major Depressive Disorder in Young Adulthood among Those with Child Physical and Sexual Abuse
- Figure 2: Unadjusted and Adjusted Odds Ratios of Having Substance Dependence in Young Adulthood among Those with Child Physical and Sexual Abuse
- Figure 3: Unadjusted and Adjusted Odds Ratios of Having Daily Smoking in Young Adulthood among Those with Child Physical and Sexual Abuse
- Figure 4: Unadjusted and Adjusted Odds Ratios of Having Major Depressive Disorder at Age of 21 among Those with Child Physical and Sexual Abuse Measured at Aged 18 and 21 (CHDS)
- Figure 5: Unadjusted and Adjusted Odds Ratios of Having Substance Dependence at Age of 21 among Those with Child Physical and Sexual Abuse Measured at Aged 18 and 21 (CHDS)
- Figure 6: Unadjusted and Adjusted Odds Ratios of Having Daily Smoking at Age of 21 among Those with Child Physical and Sexual Abuse Measured at Aged 18 and 21 (CHDS)

List of Appendixes

Chapter 4

K

Appendix A: Variables, informant & timing of measurement

<u>Overall</u>

Appendix A:	Children's Aid Society of Toronto Data Analysis Confidential	
	Agreement (for MAP data)	
Appendix B:	Restricted Data Use Agreement (for NCS-R)	
Appendix C:	Application for the Interuniversity Consortium for Political and	
	Social Research Restricted Data Files (for NCS-R)	
Appendix D:	The Data Protection Plan (for NCS-R)	
Appendix E:	Restricted Data Use Agreement with Research Staff (for NCS-R)	
Appendix F:	Request of Data from the Christchurch Health & Development	
	Study	
Appendix G:	Email from the CHDS Researcher with Permission of Access to	
	the CHDS Data	
Appendix H:	Email from the CHDS researcher with CHDS Data	
Appendix I:	Childhood Experiences of Violence Questionnaires Short Form	
	(CEVQ-SF)	
Appendix J:	Childhood Experiences of Violence Questionnaires (CEVQ)	

List of Abbreviations

CDC = Centers for Disease Control and Prevention CEVQ = Childhood Experiences of Violence Questionnaire CEVQ-SF = Childhood Experiences of Violence Questionnaire Short Form CHDS = Christchurch Health and Development Study CPS = Child Protective Services CTQ = Childhood Trauma Questionnaire MAP = Maltreatment and Adolescent Pathways NCS-R = National Comorbidity Survey Replication OCHS = Ontario Child Health Study PTSD = Posttraumatic Stress Disorder PA = Physical Abuse SA = Sexual Abuse SES = Socioeconomic Status TSCC = Trauma Symptoms Checklist for Children

WHO = World Health Organization

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Chapter 1: Introduction

1.1. Statement of Purpose

Child maltreatment research in the past two decades has provided information about risk indicators, prevalence, and its association with adverse developmental consequences (Cicchetti & Toth, 2005; Gilbert et al., 2009a). There is not yet a universal definition of child maltreatment or its subtypes (Cicchetti & Toth, 2005; Manly, 2005). Fundamental to any research question involving child maltreatment is a valid and reliable approach to measuring such exposure. The development of rigorous methodological approaches to conducting research in child maltreatment must take into account the unique ethical and legal aspects of such research (MacMillan et al., 2007). Assessment of childhood maltreatment in large population-based studies often relies on retrospective selfreports that have fewer ethical and legal concerns, but may introduce recall bias (Fergusson, Horwood, & Woodward, 2000).

This research has shown that child maltreatment often occurs in the presence of other adversities, including parental and family problems, and other negative environmental circumstances such as poverty (Gilbert et al., 2009a). The effects of child maltreatment are thought to influence subsequent life events and developmental pathways, thereby providing complex interrelatedness of these factors throughout the lifespan (Cicchetti & Toth, 2005).

Despite growing evidence for the presence of multiple risk indicators associated with the occurrence of child maltreatment, the effects of potential

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confounders are not controlled for in many studies (Fergusson, Boden, & Horwood, 2008). According to ecological theory, it is the interactions of many factors across context and developmental stages that are thought to result in exposure to child maltreatment (Bronfenbrenner, 1979; Gilbert et al., 2009a). Likewise, these early contextual factors may influence the impact of child maltreatment including the developmental course of affected children and the functioning of adult roles. For this reason, to accurately estimate the abuse effect, confounders should be accounted for in any analyses examining the impairment associated with maltreatment (Kessler, GillisLight, Magee, Kendler, & Eaves, 1997).

The concept of an intergenerational cycle of violence supports the view that maltreated children are at increased risk of experiencing an abusive relationship in adulthood and being abusive with their own children, yet its mechanism is unclear (Dixon, Browne, & Hamilton-Giachritsis, 2009; Kaufman & Zigler, 1989). The goals of child maltreatment research as a whole include disrupting this cycle of violence to reduce the burden of suffering associated with child maltreatment towards the future generations.

This thesis had three main objectives. The first objective was to examine the psychometric properties of a self-report measure of child maltreatment. There are many factors that influence self-report of child maltreatment such as fear of stigmatization, conscious and unconscious denial, recall, and perception differences (Fergusson et al., 2000). Determining the psychometric properties of

any instrument designed to assess child maltreatment is an important first step in accurately estimating the effect of such experiences. This study evaluated the self-report measure of maltreatment, the Short Form of the Childhood Experiences of Violence Questionnaire (CEVQ-SF) (Walsh, MacMillan, Trocmé, Jamieson, & Boyle, 2008) in a sample of adolescent involved with child welfare services.

The data for this study was from the Maltreatment and Adolescent Pathways (MAP) project (Wekerle et al., 2009). To examine the two-week testretest reliability, the CEVQ-SF and its original version (CEVQ) were administered to a subsample of youth. To evaluate the criterion validity, both versions of the CEVQ were compared with the Childhood Trauma Questionnaire (CTQ) (Bernstein et al., 1994; Bernstein et al., 2003), a well-validated measure of child maltreatment, in classifying child physical and sexual abuse. Construct validity was examined by comparing the association between each of two versions of the CEVQ with traumatic symptoms (Traumatic Symptom Checklist for Children: TSCC) (Briere, 1996), and with the construct validity of the CTQ. The CEVQ-SF and the CEVQ questionnaires are attached in the Appendix I and J, respectively.

For this study, I designed and conducted analyses, interpreted the results and drafted the manuscript. Dr. MacMillan supervised all aspects of this study and its implementation, including being a co-signer on the confidential agreement with three participating child welfare agencies with me (see Appendix A). Dr.

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Wekerle provided clinical advice in the area of child welfare youth. Drs. Leung and Waechter provided technical assistance with the MAP data. Ellen Jamieson, Dr. Andrea Gonzalez, and all other authors helped to interpret findings and revise the draft. A manuscript based on this study has been submitted to the Journal of Interpersonal Violence, and is currently under review.

The second objective was to investigate the functional outcomes of young adults who were maltreated in childhood, with a focus on their economic productivity in relation to impairment in health and education. As the World Health Organization defines, "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 1948), all children, regardless childhood circumstance, deserve to became a young adult with full potential of economic productivity as part of adult functional roles. Given the paucity of research attention given to labour force outcomes in maltreatment research, we have very little knowledge about their experiences and possible challenges as well as intervention needs.

The data for this study was drawn from the first and the third waves of the Ontario Child Health Study (OCHS) (Boyle et al., 2006; Boyle, Offord, Hofmann, & Catlin, 1987). I conceived a research question, designed and conducted analyses, interpreted the results and drafted the manuscript with guidance and supervision from Dr. MacMillan. Dr. Boyle provided expertise in the OCHS data and multilevel modeling. Ms. Jamieson, Eric Duku, and Dr. Katholiki Georgiades helped with the statistical analyses. All authors helped to interpret the results and

edit the manuscript. This study has been submitted to the Journal of Aggression, Maltreatment, and Trauma; it was favourably reviewed and a revision has been under review.

The third objective was to examine the robustness of the association of child maltreatment with adult emotional and behavioural outcomes across different designs. In the literature, there is variation in methods used to estimate these associations. There may be systematic errors associated with the use of specific designs and approaches to measure child maltreatment as well as the selection of certain contextual variables in maltreatment research. This study used three community-based studies with different methodologies to examine the extent to which research design and approaches to classifying maltreatment influence exposure-outcome associations. This study also examined the effect of variability in timing of administration of child maltreatment measures in relation to assessment of outcome within the same cohort.

The three datasets used for this study were the National Comorbidity Survey-Replication (NCS-R), the OCHS, and the Christchurch Health and Development Study (CHDS). Most of the NCS-R was publicly accessible; however access to information on childhood traumatic events was restricted. I obtained permission to access the restricted NCS-R data from the Inter-University Consortium for Political and Social Research (see Appendix B to E). The CHDS was not publicly accessible; therefore I contacted Dr David Fergusson, the Principal Investigator of the CHDS, to request access to those parts of the CHDS

that were required for this study. My letters of request and email response from the CHDS staff are attached in the Appendix F to H. For this project, I conceived a research question, designed and conducted analyses, interpreted the results and drafted the manuscript with guidance from Drs. MacMillan and Boyle. I consulted Dr Harry Shannon for additional statistical advice. Ms. Jamieson and all other authors helped to interpret the results and edit the manuscript.

In this chapter, I provide an overview of the key epidemiologic aspects of child maltreatment, including distribution, determinants, consequences and methodological issues. In order to address the thesis objectives described above, I summarize the methods and results of three separate studies in the chapters that follow. The final chapter of this thesis summarizes the key findings and discusses future research.

1.2. Definition

Despite the recognition of child maltreatment as a global public health issue, there is no consensus on definition of child maltreatment or standardized definitions of the common subtypes (Cicchetti & Toth, 2005). Different definitions of child maltreatment are developed across community organizations, at the government level, and by researchers and clinicians to serve a particular purpose (Health Canada, 2001). For example, provinces or territories often adapt legislation-based definitions that focus on evidentiary criteria to prove or disprove the case of reported child maltreatment. Child welfare caseworkers may focus on clinically-based criteria to determine the course of action to protect children and

provide family resources. Psychology and social science researchers may focus on children's development in deciding on definitions that are relevant to research (Health Canada, 2001).

Reflecting a broad spectrum of child maltreatment recognized across countries and culture, The World Health Organization (WHO) defines child maltreatment as follows:

"Child abuse or maltreatment constitutes all forms of physical and/or emotional ill-treatment, sexual abuse, neglect or negligent treatment or commercial or other exploitation, resulting in actual or potential harm to the child's health, survival, development or dignity in the context of a relationship of responsibility, trust or power." (WHO/ISPCAN, 2006)
Child maltreatment is often differentiated into four subtypes: physical abuse (PA), sexual abuse (SA), emotional/psychological abuse, and neglect. Exposure to intimate partner violence can be included in emotional/psychological abuse or considered a fifth subtype (Gilbert et al., 2009a).

The following sections summarize the descriptions of each type of child maltreatment used in the research context. To compare these descriptions with the definition of child maltreatment typically used in child protective services (CPS), specific child maltreatment acts investigated in Canadian CPS are provided following the research definitions. The CPS definitions are based on information from the Canadian Incidence Study of Reported Child Abuse and Neglect, the first national child maltreatment surveillance carried out by the

Public Health Agency of Canada. The CIS provides reliable estimates and characteristics of reported child abuse and neglect. The first two CIS surveillance studies were conducted in 1998 and 2003 (CIS-1998, CIS-2003), and results of the third cycle conducted in 2008 are forthcoming (Trocmé et al., 2001; Trocmé et al., 2005).

1.2.1. Physical abuse

PA of a child may be defined as the intentional use of physical force against a child that results in, or has a high likelihood of resulting in, harm for the child's health, survival, development or dignity (WHO/ISPCAN, 2006). A wide range of behaviours are included within the definition of physical abuse, including hitting, beating, kicking, shaking, biting, strangling, scalding, burning, poisoning and suffocating.

It should be noted that discipline and punishment may overlap with PA; for example, some consider excessive discipline a subtype of PA. While discipline is generally a set of behaviours or interactions intended to help children develop their own self-discipline through such methods as role setting and redirection of a child, corporal punishment is often driven by a caregiver's anger and uses physical and emotional force that can lead to serious injury and impairment in children's development (WHO/ISPCAN, 2006).

In the CIS, PA is classified into five forms of abuse: (1) shake, push, grab or throw, including pulling or dragging a child, (2) hit with hand, including slapping and spanking but not punching, (3) punch, kick or bite, including hitting with other parts of the body such as elbow or head, (4) hit with object, including hitting with a stick, a belt or other object, throwing an object at a child, but does not include stabbing with a knife, and (5) other physical abuse including choking, strangling, stabbing, burning, shooting, poisoning, and the abusive use of restraints (Trocmé et al., 2005).

1.2.2. Sexual abuse

SA is defined as the "involvement of a child in sexual activity that he or she does not fully comprehend, is unable to give informed consent to, or for which the child is not developmentally prepared, or else that violates the laws or social taboos of society" (WHO/ISPCAN, 2006). According to WHO, children can be sexually abused by both adults and other children; however the Centers for Disease Control and Prevention (CDC) defined sexual abuse as "any completed or attempted sexual act, sexual contact, or non-contact sexual interaction with a child by a caregiver" that includes substitute caregivers such as teachers and relatives (CDC report, 2008).

The CIS-2003 includes eight forms of sexual abuse: (1) penetration, (2) attempted penetration, (3) oral sex, (4) fondling, (5) sex talk, (6) voyeurism, (7) exhibitionism, and (8) exploitation (Trocmé et al., 2005). One important difference in the definition of SA between CPS and researchers is that studies based on the CPS report only include SA committed by parents or relatives in a caregiving role. SA cases that do not involve perpetrators in a caregiving role

such as parents or relatives are investigated by police; these cases are not included in CPS estimates (Trocmé et al., 2005).

1.2.3. Emotional abuse

Emotional or psychological abuse involves failure of a caregiver to provide a developmentally appropriate and supportive environment. It includes the "restriction of movement; patterns of belittling, blaming, threatening, frightening, discriminating against or ridiculing; and other non-physical forms of rejection or hostile treatment" (WHO/ISPCAN, 2006).

Emotional maltreatment is difficult to document by the CPS, as it may not be identified by the occurrence of a specific incident or have clearly identifiable evidence of exposure (Trocmé et al., 2005). The child welfare statutes for emotional maltreatment vary by regions. The CIS-2003 examined four forms of emotional maltreatment: (1) emotional abuse (a child's suffering or risk of suffering from mental, emotional, or developmental problems due to overtly hostile, punitive treatment, or habitual or extreme verbal abuse), (2) non-organic failure to thrive (e.g., a child under three years has suffered a marked retardation or cessation of growth for which no organic reasons can be identified), (3) emotional neglect (a child's suffering or risk of suffering from mental, emotional, or developmental problems due to inadequate nurturance/affection, and (4) exposure to violence between adults other than caregivers (Trocmé et al., 2005).

Although exposure to domestic violence is often included under the category of emotional abuse, CIS-2003 examined this form separately to reflect

the increased recognition of exposure to domestic violence, as well as the fact that most Canadian jurisdictions have developed policies and practices specifically for response to exposure to domestic violence (Trocmé et al., 2005). In the CIS-2003, exposure to domestic violence is defined as a child has been a direct or indirect witness to violence occurring between the caregivers or a caregiver and his/her partner (Trocmé et al., 2005).

1.2.4. Neglect

Neglect includes failure of a parent or other family member to provide for the development and well-being of the child in one or more of the following areas: health, education, emotional development, nutrition, shelter and safe living conditions (WHO/ISPCAN, 2006). The definition by the CDC also includes the provision of adequate hygiene (CDC report, 2008).

The CIS-2003 examined eight forms of neglect: (1) failure to supervise for physical harm, (2) failure to supervise for sexual abuse, (3) physical neglect, (4) medical neglect, (5) failure to provide psychological/psychiatric treatment, (6) permitting criminal behaviour, (7) abandonment, and (8) educational neglect (Trocmé et al., 2005).

1.3. Measurement of child maltreatment

Child maltreatment is difficult to measure, and assessing the psychometric properties of approaches to gathering information about child abuse and neglect is essential. There is an ongoing debate about the validity of both CPS official reports and retrospective self-report measures in maltreatment research (Kendall-

Tackett & Becker-Blease, 2004; Widom & Shepard, 1996; Widom & Morris, 1997). This section summarizes the methodological issues associated with measurement of child maltreatment.

1.3.1. Child protective services official report

The CPS official records include information about the type of maltreatment(s), and a determination of whether the incident(s) was investigated and a decision regarding substantiation status. Reports of suspected child maltreatment are made from both professional personnel (e.g., law, education, social services, and medical) and non-professional individuals. Biases in reporting have been noted; for example, research has shown that minority children are disproportionately represented in CPS reports (Lane, Rubin, Monteith, & Christian, 2002). It has been recognized that investigations as well as decisions about substantiation may vary across investigators, agencies and provinces. This introduces another bias related to use of CPS reports as a measure of child abuse (Gilbert et al., 2009b). However, the most serious limitation is that not all maltreatment is brought to the attention of CPS, thus the official reports underestimate the scope of this problem in the general population.

In Canada, there are three levels of substantiation specified by CPS workers: unsubstantiated, suspected, and substantiated, although there are some jurisdictions that uses only unsubstantiated and substantiated. A case is considered *substantiated* if the balance of evidence indicates that abuse or neglect has occurred. A case is *suspected* if there is not enough evidence to substantiate

maltreatment, but there nevertheless remains a suspicion that maltreatment has occurred. A case is *unsubstantiated* if the balance of evidence indicates that abuse or neglect has not occurred (Trocmé et al., 2005).

1.3.2. Retrospective self-report

Most population-based studies have relied on self-report of exposure to child maltreatment. It is anticipated that future studies will continue to use this type of measurement, as prospective measurement of maltreatment in communitybased studies is not generally practical and has specific ethical constraints (for example, interviewing a young child about exposure to child maltreatment in a community-based survey places this person in a position where he/she is likely not able to understand the ramifications of answering such questions). Use of retrospective self-reports provides better estimates of the scope of child maltreatment in a population-based survey, compared with CPS reports, (Gilbert et al., 2009a). Although most measures of child maltreatment have not been validated, several studies have demonstrated the reliability and validity of a few self-report measures of child maltreatment (Bernstein et al., 1994; Bernstein et al., 2003; Walsh et al., 2008).

1.4. Distribution

1.4.1. Incidence

The incidence rate of child maltreatment is the number of new child maltreatment cases among a specific population during a certain period of time (Trocmé et al., 2001). The incidence of child maltreatment in Canada was

investigated in the CIS-1998 and CIS-2003 (Trocmé et al., 2001; Trocmé et al., 2005). Based on the CIS-2003, an estimated 217,319 child maltreatment investigations were conducted in Canada outside Quebec, with an annual incident rate of 45.68 investigations per 1,000 children aged 1 to 15 years. Of those investigated, 47% was substantiated by the investigating worker (incidence rate: 21.71 per 1,000 children). An additional 13% was suspected, and remaining 40% was unsubstantiated (Trocmé et al., 2005). The incidence rates for the primary categories of physical, sexual abuse, neglect, emotional maltreatment, and exposure to domestic violence were 5.31, 0.62, 6.38, 3.23, and 6.17 per 1,000 children, respectively (Trocmé et al., 2005).

1.4.2. Prevalence

The prevalence of child maltreatment is the proportion of a certain population who have ever exposed to child maltreatment during a specific time frame. The prevalence of child maltreatment can be measured over different time periods, for example, in the past 12 months. Lifetime prevalence of child maltreatment is often measured by retrospective self-report asking participants about maltreatment that occurred during childhood (e.g., before the age of 16 or 18 years). In a recent review, the prevalence of lifetime PA based on self-report or parental-report (for young children) was estimated to be between 5–35% among several developed countries (Gilbert et al., 2009b). The lifetime prevalence of SA (both contact and non-contact abuse) in developed countries (Australia, New Zealand, Canada, and USA) ranged from 15–30% for girls and 5–

15% for boys; the figures for penetrative sexual abuse were lower: 5-10% of girls and 1-5% of boys were exposed during childhood (Gilbert et al., 2009b). A community-based study in Canada (aged 15 years and older) reported the lifetime prevalence of PA was higher for males (31.2%) than females (21.1%), while prevalence of SA was higher for females (12.8%) than males (4.3%) (MacMillan et al., 1997).

A small number of studies have examined the prevalence of psychological abuse. Results from large population-based, self-report studies in the UK and US indicated that the cumulative prevalence of reported psychological abuse in childhood is 8–9% of women and about 4% of men (Edwards, Holden, Felitti, & Anda, 2003; May-Chahal & Cawson, 2005).

Neglect has not often been included as a concept in self-report and parentreport studies despite being the most frequent category of child maltreatment substantiated by CPS agencies in developed countries (Gilbert et al., 2009b). This is partly due to difficulties in measuring neglect in a community-based sample, given that there are many forms of neglect across context and developmental stages.

There are important differences between studies that estimate prevalence of child maltreatment based on self-report versus CPS report; the two are not directly comparable, since many incidents of child maltreatment do not come to the attention of CPS. The CPS data are based only on reported maltreated cases, and much of the data are based on substantiated reported cases (Gilbert et al.,

2009b; Trocmé et al., 2005). In the CIS, the primary form of maltreatment is defined as the form that best characterized the investigated maltreatment (Trocmé et al., 2005). These methodological features tend to underestimate the prevalence of child maltreatment. Also, the CPS data typically measure point prevalence (e.g., during the last year), whereas self-report approaches often measure lifetime exposure to child maltreatment. Based on the CPS reports, the annual prevalence of substantiated child maltreatment in Canada, US, and Australia was 0.97, 1.21, and 0.68, respectively, with neglect being a primary reason for substantiated cases in three countries (Gilbert et al., 2009b).

1.4.3. Severity of maltreatment

There is no consensus on how to define and measure the *severity* of child maltreatment. Several authors have suggested that increased frequency and longer duration of exposure to maltreatment are the indicators of severity of maltreatment (Higgins, 2004; Thornberry, Ireland, & Smith, 2001; Walsh et al., 2008). In addition, it has been consistently shown that exposure to multiple types of child maltreatment is associated with increased adjustment problems compared with exposure to a single type of abuse (Higgins & McCabe, 2001; Lau et al., 2005). In a study of self-reported child maltreatment in a geographically diverse sample of undergraduate students, both experiencing multiple abuse types and severity of abuse independently predicted adult trauma symptomatology (Clemmons, Walsh, DiLillo, & Messman-Moore, 2007).
1.4.4. Multiple types of maltreatment

Research to date has shown that different types of maltreatment often cooccur (Claussen & Crittenden, 1991; Gilbert et al., 2009a). Estimates of the proportion of cases identified by CPS involving multiple types of maltreatment ranged from 46% to 90% (Barnett, Manly, & Cicchetti, 1993; McGee, Wolfe, Yuen, Wilson, & Carnochan, 1995). Data on the prevalence of multiple types of maltreatment in general population samples are limited. An Ontario communitybased survey conducted in the early 1990's (MacMillan et al., 1997) found that 33% of males and 27% of females reported exposure to child physical or sexual abuse. Self-reports of exposure to both types of abuse were 2.4% in males and 6.7% in females respectively, with a significant sex difference (MacMillan et al., 1997). In the OCHS sample of 1893 young adults, 4.4% of males and 10.3% of females reported both physical and sexual abuse, with a significant sex difference (unpublished). As most community-based studies of child maltreatment focus on measuring physical and sexual abuse, less is know about multiple maltreatment types with other forms, such as emotional abuse and neglect (Higgins & McCabe, 2001). Using a small number of self-selected community samples, Higgins et al (2000) reported that 43.4% had more than one type of physical, sexual, and psychological abuse, neglect, or witnessing family violence (Higgins & McCabe, 2000).

1.5. Determinants

1.5.1. Definition of risk factor

In epidemiological terms, a risk factor is a correlate that *precedes* the outcome, and can be either causal or non-causal. It is considered causal if the risk factor is shown to alter the outcome when it is changed. It is non-causal if the risk fact is fixed; examples include sex or race/ethnicity or if a change in the factor does not lead to a change in the risk of the outcome (Kraemer et al., 1997; Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001). In the child maltreatment literature, the term, risk factor is often used to imply an association, and appears even when the temporal or causal relationships are unclear. For factors that correlate without temporal or causal relationships, the term, risk indicator should be used. Only longitudinal study designs can determine a causal relationship between two factors (Kraemer et al., 1997; Kraemer et al., 2001). Determining causal risk factors for child maltreatment is difficult because such factors need to be measured before child maltreatment occurs. Research often relies on use of CPS records or retrospective self-report child maltreatment data, which precludes determination of causal risk factors.

1.5.2. Risk indicator

In the literature, the ecological model has been used to describe potential risk indicators for child maltreatment (Bronfenbrenner, 1979). This model helps in understanding the occurrence of child maltreatment in the presence of complex interactions among a number of factors measured at different levels – individual

(for both perpetrators and children), family relationship, community, and social level (WHO/ISPCAN, 2006).

At the child level, sex of a child is a risk indicator for certain types of maltreatment. Females are more likely to experience sexual abuse (Putnam, 2003); however the rates of other types of maltreatment in high-income countries are similar (Gilbert et al., 2009a). Certain ages of children may be risk indicator for maltreatment, but the evidence is unclear. Age was inversely correlated with child maltreatment based on CPS reports (i.e., more reported cases in younger ages than older ages), but the opposite was observed in studies where maltreatment was measured with self-report or parental report. This may be due to limited or lack of recall of maltreatment at very young ages among adolescent or adult participants in self-report surveys (Gilbert et al., 2009a). The rates of child death due to PA and neglect are higher among children of very young ages (< 5 years) (WHO/ISPCAN, 2006). In Canada, the age-adjusted relative risks of homicide between the lowest versus the highest neighborhood income quintiles were 2.95 for all children under 15 years of age and 3.39 for children under 5 years of age (Birken, Parkin, To, Wilkins, & Macarthur, 2009).

Other risk indicators include a child with high needs, difficult personality or temperament, and disability (Hibbard, Desch, American Academy of Pediatrics Committee on Child Abuse and,Neglect, & American Academy of Pediatrics Council on Children With,Disabilities, 2007); although it is important to note that

child risk indicators may have been the result of rather than a cause of subsequent maltreatment.

The risk indicators of caregivers include physical, mental, and cognitive problems that interfere with parenting such as involvement with criminal activities, alcohol and drug problems, a history of maltreatment during childhood (Dixon, Hamilton-Giachritsis, & Browne, 2005; Kaufman & Zigler, 1989), and a belief in the effectiveness of corporal punishment (Gilbert et al., 2009a; WHO/ISPCAN, 2006).

Family-relationship risk indicators include lack of parent-child attachment, family member's poor health, marital problems, family violence, and lack of external support (WHO/ISPCAN, 2006). At the community level, risk indicators include high levels of unemployment and poverty, as well as social and gender inequality in the community. Societal-level risk indicators include policies that lead to inequality or instability in the socioeconomic and educational environments (WHO/ISPCAN, 2006). An ecological transactional model suggests that maltreatment occurs when multiple risk indicators outweigh protective or buffering effects (Cicchetti & Toth, 2005).

Some factors have been commonly associated with all types of maltreatment, while others were abuse type specific. Prospective studies have identified that young maternal age and maternal psychiatric disorders predicted the occurrence of physical and sexual abuse, and neglect (Brown, Cohen, Johnson, & Salzinger, 1998; Mersky, Berger, Reynolds, & Gromoske, 2009). Several

studies have suggested that low income and low parental education tend to have the highest rates of physical abuse and neglect (Gilbert et al., 2009a), but not sexual abuse (Finkelhor & Baron, 1986). Specific risk indicators of sexual abuse include living without a biological parent, unavailability of the mother to the child due to work or disability, marital problems, poor parent-child relationship, and living in the presence of a stepfather (Finkelhor & Baron, 1986). However, one study where child abuse was measured when the child was in grade 6, found that low income was a risk indicator for both physical and sexual abuse (Hussey, Chang, & Kotch, 2006). Variability in findings across studies about the etiology of SA is likely due to use of different samples and measures (Black, Heyman, & Slep, 2001).

Previous research has also identified a dose-response relationship between the number of risk indicators and the likelihood of physical and sexual abuse, and neglect (Brown et al., 1998). Brown et al. (1998) found that the prevalence of child abuse or neglect was 3% without risk indicators; this increased to 24% when four or more risk indicators were present.

1.5.3. Perpetrator

About 80% of perpetrators in cases of substantiated physical and emotional abuse, and neglect in the U.S. and Canada were parents (Trocmé et al., 2005; U.S. Department of Health and Human Services, Administration for Children and Families, 2006). This figure is lower for SA; 14% and 26% of perpetrators of substantiated sexual abuse were parents in Canada and the U.S.,

respectively, and these figures were 46% and 29% for non-parental relatives (Trocmé et al., 2005; U.S. Department of Health and Human Services, Administration for Children and Families, 2006).

1.6. Consequences

There is an established relationship between child maltreatment and impairment in key areas of development including mental health, physical health, academic performance, cognitive development, relational functioning, and behavioural problems (Gilbert et al., 2009a). This section provides a summary of consequences in these areas.

1.6.1. Mental health

Child maltreatment increases the risk of behaviour problems, including internalizing (anxiety, depression) and externalizing (aggression, acting out) behaviour (Gilbert et al., 2009a). Behaviour problems in childhood seem to be associated with early onset of maltreatment (Kotch et al., 2008; Manly, Kim, Rogosch, & Cicchetti, 2001), and the problems that arise in adolescence may be related to maltreatment during adolescence (Thornberry et al., 2001). Research has consistently shown a cumulative effect of different types of maltreatment on later behaviour problems (Appleyard, Egeland, van Dulmen, & Sroufe, 2005; Thornberry et al., 2001).

Maltreated children have a moderately increased risk of depression in adolescence and adulthood (adjusted odds ratios ranging from 1.3 to 2.4) with no evidence for a specific effect of any particular type of maltreatment (Gilbert et al.,

2009a). For many maltreated individuals, the onset of depression begins in childhood that may increase the risks of symptoms cascading into other areas of functioning (Thornberry et al., 2001; Widom, White, Czaja, & Marmorstein, 2007).

Prospective and retrospective studies consistently show associations between physical or sexual abuse or neglect and PTSD in adolescents and adults (Gilbert et al., 2009a). Symptoms include recurrent intrusion of frightening thoughts and memories, sleep difficulties, and detached or numb feelings, which may affect individuals' functioning (De Bellis, 2001). Family factors, such as having a parent who has alcoholic problems or has been arrested also increased the risk of PTSD. A meta-analysis of studies of sexually abused children suggests a dose-response effect, with higher risks associated with penetrative SA than with contact or non-contact abuse (Andrews, Corry, Slade, Issakidis, & Swanston, 2004).

Regarding adult personality disorders, there is no clear link between this aspect and maltreatment, although one prospective study showed an increased risk of personality disorder in children of psychological abuse, independent of PA, SA and neglect (Johnson et al., 2001).

Consistent evidence suggests that both physical abuse and sexual abuse are associated with an increased risk of attempted suicide among youth after adjustment for confounding family and individual variables (Fergusson et al.,

2008). The association between neglect and attempted suicidal are mainly explained by family context (Brown, Cohen, Johnson, & Smailes, 1999).

The hypothesis that sexually abused children use self-injurious behaviour as a maladaptive coping mechanism is weakly supported by a meta-analysis of 45 retrospective studies; the effect of SA is likely through increased psychiatric risk factors (Klonsky & Moyer, 2008). However, a prospective study of a low-income community sample reported a strong association with SA but no association with PA and neglect. In this same study, dissociation was a significant mediator of the association between SA and recurrent self-injurious behaviour (Yates, Carlson, & Egeland, 2008).

The association between child maltreatment and increased risk of alcohol problems in adolescence and adulthood has been inconclusive after adjustment for family characteristics and parental alcohol use (Gilbert et al., 2009a). However a prospective study (Widom, Ireland, & Glynn, 1995; Widom et al., 2007) and a systematic review of 224 studies (Simpson & Miller, 2002) have indicated the sex difference; the association of child maltreatment with alcohol problems in adulthood was only seen in females, partly mediated by other psychiatric conditions, such as anxiety and depressive disorders (Simpson & Miller, 2002).

The link between child maltreatment and substance dependency is unclear. One prospective study reported no group difference between maltreated children and community controls in a diagnosis of drug dependency by the age of 29 years (Widom, Weiler, & Cottler, 1999). However, at roughly 40 years of age, the same

study has shown the increased risk for present illicit drug use only among individuals who were maltreated in childhood (Widom, Marmorstein, & White, 2006). Investigators of this study speculated that although individuals who were exposed to child maltreatment would mature out of drug use, they might continue problematic substance use. A cross-sectional study have shown the dose-response relationship between the multiple forms of abuse and other childhood adversities and increased risk of self-reported alcohol or drug misuse in adulthood (Dube, Anda, Felitti, Edwards, & Williamson, 2002).

1.6.2. Physical health

Child maltreatment is associated with a broad range of adverse physical health outcomes, as well as behaviours that increase risk for such outcomes (MacMillan, 2010). The strong associations between PA, SA, and neglect and obesity have been reported, that are independent of family and individual characteristics including childhood obesity (Johnson, Cohen, Kasen, & Brook, 2002; Thomas, Hypponen, & Power, 2008). Retrospective studies also suggest an association between SA and eating disorders, but there is less information about other forms of maltreatment (Brewerton, 2007).

Large cross-sectional studies have reported associations between multiple childhood adversities, including child maltreatment, and a range of health outcomes in adulthood including ischaemic heart disease, cancer, chronic lung disease, skeletal fractures, and liver disease, even with little adjustment for lifetime confounders (Felitti et al., 1998). One of the possible mechanisms which

may explain the association between child maltreatment and physical health problems is the link through risk behaviours such as smoking, alcohol abuse, poor diet and lack of exercise (WHO/ISPCAN, 2006).

The associations between exposure to SA and subsequent sexual adjustment have been reported in several studies. Systematic reviews of various types of study reported the strong association between SA and sex trading (e.g., prostitution) in adolescence or adulthood, and the greater effects for females than for males has been shown (Arriola, Louden, Doldren, & Fortenberry, 2005; Senn, Carey, Vanable, Coury-Doniger, & Urban, 2007). However, one prospective study with follow-up at 29 years of age reported a significant association between physical or sexual abuse or neglect and sex trading with a significant association only among females (Wilson & Widom, 2008).

Two prospective studies have shown the association between SA and teen pregnancy (Lansford et al., 2007; Thornberry et al., 2001). Several studies have noted the moderate associations of SA with earlier onset of sexual activity, greater numbers of sexual partners, increased rates of teenage pregnancy as well as abortion, and increased risks of sexually transmitted disease (Arriola et al., 2005; Brown, Cohen, Chen, Smailes, & Johnson, 2004; Fergusson, Horwood, & Lynskey, 1997; Senn et al., 2007; Thornberry et al., 2001). These effects are stronger with more severe or repeated SA (Brown et al., 2004; Fergusson, Horwood, & Lynskey, 1996), or exposure to multiple childhood adversities (Hillis et al., 2004).

There is inconclusive finding regarding an association between child maltreatment and chronic pain in adults. Although several studies have reported the modest associations between SA or PA (but not neglect) and pain in adulthood (Davis, Luecken, & Zautra, 2005; Linton, 2002; Walsh, Jamieson, Macmillan, & Boyle, 2007), there is no clear evidence of this association based on prospective studies. Some researchers suggest the possibility that *memories* of childhood abuse is associated with chronic pain in adulthood and abused individuals with chronic pain are more likely to seek health care than are non-abused individuals with chronic pain (Davis et al., 2005).

The possible link of child maltreatment to smoking has been suggested in recent studies. Using a sample of socially disadvantaged minority samples from the Chicago Longitudinal Study, Topitzes, Mersky, and Reynolds (2010) examined the relationship between official reports of child maltreatment and self-reported tobacco smoking by young adults, accounting for a broad range of mediators. They found that official reports of child maltreatment predicted smoking in young adulthood in both genders. This association was mediated by several factors including emotional, social, and cognitive factors in adolescence and young adulthood, and school mobility (Topitzes, Mersky, & Reynolds, 2010). Jun et al. (2008) examined the relation between child maltreatment and the timing of initiation of smoking, using a large sample from the prospective Nurse Health Study, with a retrospective self-report of child maltreatment. They found a strong grading association between severity and accumulation of child maltreatment and

early initiation of smoking among females. However the smoking status in adolescence was more strongly associated with adolescent maltreatment than childhood maltreatment (Jun et al., 2008). Less is known about the mechanisms of this suggested link between child maltreatment and smoking including comorbidity with other psychiatric conditions (Sacco et al., 2007).

1.6.3. Aggression and violence

There are relatively few prospective studies on the association between child maltreatment and later violence (i.e., delinquency and criminality) (Maas, Herrenkohl, & Sousa, 2008). One prospective study using official records of child maltreatment and matched controls has found that individuals reported for PA or neglect in childhood increased the likelihood of arrest as a juvenile and as an adult (Widom, 1989). Maltreated children also had an increased number of offenses, were first arrested at an earlier age, and were more likely to repeat offenses compared to controls (Widom, 1989). A systematic review of retrospective studies that examined youth violence perpetration as an outcome (e.g., aggravated assault, rape, murder, physical fighting) has reported that PA might be more strongly related to youth violence than other types of maltreatment; in addition, exposures to multiple types of maltreatment and more severe abuse appear to increase the likelihood of violence perpetration in youth (Maas et al., 2008). However, less severe forms of physical punishment and harsh parenting might relate to later youth violence in the context of other adversities such as poverty and high levels of community violence (Maas et al., 2008). The

sex difference in the association between child maltreatment and later violence perpetration is still unclear; however, several researchers suggest the stronger effect of maltreatment on later violence perpetration including intimate partner violence in females than males (Herrenkohl et al., 2004; Widom & Maxfield, 1996).

1.6.4. Cost

Several studies in North America have suggested that child maltreatment not only causes personal pain and suffering but also may increase the economic burden. In one study using a national probability sample of US community hospitals, Rovi, Chen, and Johnson (2004) have found that children whose diagnosis for hospitalization was child abuse or neglect had a longer hospital stay, twice the number of diagnoses, and double the total charges compared to children of other hospitalization (Rovi, Chen, & Johnson, 2004). Similarly, using longitudinal administrative data of low-income children, Lanier et al. (2010) compared the risk of hospital-based care for asthma, cardio-respiratory illness and infections between maltreated and non-maltreated children (Lanier, Jonson-Reid, Stahlschmidt, Drake, & Constantino J., 2010). They found that children reported for maltreatment were at increased risk of hospital care for each of these conditions at 12 to 18 years, controlling for individual, family, and community factors. Furthermore, recurrent reports of maltreatment were associated with a greater number of hospital care episodes for these illnesses.

Research on the link between self-reported childhood PA or SA and health care services and costs in adult population has found this association among individuals aged 15 years or older (Chartier, Walker, & Naimark, 2007) and women aged between 18 and 64 years (Bonomi et al., 2008). Mental health and physical health problems in adults have a major economic impact through associated health care costs as well as the lost work productivity due to absenteeism and diminished productivity (Bender & Farvolden, 2008; Katon, 2009; Kessler, Merikangas, & Wang, 2008). At the individual and family levels, the loss of income and cost of medication create a strain on the family financial resources.

1.6.5. Education

Evidence has consistently shown an association between child maltreatment and reduced academic performance and educational achievement (Boden, Horwood, & Fergusson, 2007; Eckenrode, Laird, & Doris, 1993; Kendall-Tackett & Eckenrode, 1996; Perez & Widom, 1994). Several researchers have found that maltreated children scored significantly lower than nonmaltreated children on reading and math scores, and maltreated children were also more likely to repeat a grade (Eckenrode et al., 1993; Kendall-Tackett & Eckenrode, 1996).

Prospective longitudinal studies have shown that child maltreatment predicted lower educational achievement (Boden et al., 2007; Perez & Widom, 1994). Perez and Widom (1994) reported that young adults (around age 28) who

were maltreated in childhood had lower IQs and fewer years of school compared with non-maltreated young adults after controlling for childhood social class. Furthermore, reduced reading scores among maltreated adults held after controlling for school attendance (Perez & Widom, 1994). Boden, Horwood, & Fergusson (2007) found that reduced levels of educational achievement among adults with a history of physical or sexual abuse were explained by social, parental, and individual characteristics (Boden et al., 2007).

Some researchers have examined the relationship between maltreatment *types* and academic performance. In these studies, neglected children had the lowest reading and math scores, whereas the scores of sexually abused children did not differ from those of control children (Eckenrode et al., 1993; Kendall-Tackett & Eckenrode, 1996). Similarly, a prospective study found significantly lower IQ and reading scores among young adults who were neglected in childhood compared with non-maltreated control adults; the same study found that physically abused individuals differed only on IQ, and there was no difference on either score between sexually abused adults and non-maltreated control adults (Perez & Widom, 1994). The temporal relationship between IQ and maltreatment is unclear. It should be noted that a prospective study indicated that low IQ in childhood predicted adult mental disorders even after controlling for childhood family socioeconomic status (SES), low birth weight and child maltreatment (Koenen et al., 2009).

These findings suggest that lower cognitive and academic skills associated with child maltreatment persist into adulthood. However, little is know about whether these negative effects influence other aspects of adult functioning beyond academic achievement and performance, such as employment and interpersonal relationships.

1.6.6. Employment

Although the association between child maltreatment and employment outcomes has not been extensively examined, a few recent studies have suggested a possible link (Gilbert et al., 2009a). A cross-sectional study involving a representative sample of US adults (ages 18-54 years) found an association between child maltreatment and lower employment as well as lower family income; the effects were larger for those with multiple types of maltreatment (Zielinski, 2009). A recent prospective study found that adults with a history of child maltreatment based on official reports had lower levels of employment, earnings, and assets, controlling for background characteristics compared with matched controls (Currie & Widom, 2010). The same study found that neglected children had the worst economic consequences compared to those with other types of maltreatment; as well there was a sex difference with larger long-term abuse effects for females than males (Currie & Widom, 2010).

Although, these studies suggest a possible link between child maltreatment and economic consequences, the mechanism by which child maltreatment may

lead to significant economic disadvantages in adults has not been explored (Currie & Widom, 2010).

1.7. Mechanisms

<u>1.7.1. Developmental traumatology</u>

The theory of developmental traumatology (De Bellis, 2001) provides a comprehensive framework for considering the potential mechanisms for impairment in maltreated individuals. This model focuses on the psychobiological effects of maltreatment, and assumes that while there are an infinite number of stressors that can affect a child, there are finite ways that the brain and the biological stress system can respond to those stressors. In this model, child maltreatment, regardless of the type, is seen as an extreme form of dysfunctional interpersonal relationship and trauma that impacts the biological stress response system and the brain functioning of a child. The changes in biological stress systems may cause symptoms of PTSD. When trauma occurs during early development, the chronic traumatic stress symptoms may lead to more severe comorbidity and impairment in cognitive and psychosocial functioning. It is thought that PTSD leads to major depression. The onset of major depression is increased for trauma-exposed persons who suffer from PTSD but not for trauma-exposure person without PTSD.

1.7.2. Resilience

Although it is recognized that not all maltreated children suffer subsequent impairment in adolescence or adulthood (Cicchetti & Toth, 2005), little is known

about factors that lead to resilience in the context of interpersonal and family violence. The resilience refers to the achievement of positive adaptation within a context of significant adversity (DuMont, Widom, & Czaja, 2007; Luthar, Cicchetti, & Becker, 2000). Prospective studies have reported that female sex predicted more resilience than males independent of abuse types (DuMont et al., 2007; McGloin & Widom, 2001). Other studies have found differential predictors of resilience between maltreated and non-maltreated children. Cicchetti & Rogosch (1997) found that for maltreated children, positive self-system predicted resilience, whereas relationship features were more important for non-maltreated children (Cicchetti & Rogosch, 1997). However, the major limitation of this research is variability in the operationalization of resilience across the following elements: the nature and number of domains of functioning, the criteria for success and adaptation, and the type and length of risk exposure necessary to constitute exposure to adversity. The wide variation in these factors across studies makes comparison of studies difficult (Heller, Larrieu, D'Imperio, & Boris, 1999).

1.8. Methodological issues

1.8.1. Ethical considerations

In child maltreatment research, it is necessary to gather in-depth information about exposure to child maltreatment whenever possible, while ensuring that the ethical and legal rights of the child and family remain paramount (MacMillan et al., 2007). A review of studies that directly asked children about

their experiences of maltreatment identified four methods of administration: faceto-face interview, telephone interview, questionnaires administered by interviewers, interviewer-administered questionnaires to a group of children, and anonymous self-complete survey; only those methods where the respondent remains anonymous assures that disclosure of child maltreatment is not reported to CPS (Amaya-Jackson, Socolar, Hunter, Runyan, & Colindres, 2000). In studies where disclosure of child maltreatment may lead to CPS reports, it is essential that participants (and their guardians) understand these risks as part of the informed consent process, and before being asked for consent. Some parents and guardians may be reluctant to give consent for their child's participation in the study. If a child perceives a lack of privacy or confidentiality, he/she may be reluctant to respond to the questionnaire. Although the direct questioning of children about exposure to maltreatment remains controversial, there is increasing recognition of the need to gather this information in developmentally appropriate ways in planning approaches for prevention and intervention (Becker-Blease & Freyd, 2006). Currently, there is no consensus as to researchers' responsibility about reporting or clinical follow-up of children who have disclosed their experience of maltreatment in the context of a survey (Amaya-Jackson et al., 2000).

1.8.2. Recall

While retrospective self-report of child maltreatment is useful for this research, recall is a major problem, as this type of measure relies on participants'

subjectivity. Among many factors that may relate to recall of child maltreatment, characteristics of exposure to child maltreatment include the severity of maltreatment (e.g., duration, frequency of occurrence, relationship with perpetrator, number of perpetrators, types of abusive acts involved, and multiple types of maltreatment) and the age of onset. Recall may be also influenced by characteristics of individuals in a study of child maltreatment, including current mood, sex, history of treatment of impairment associated with maltreatment, fear of stigma associated with disclosure, perception of exposure as maltreatment, unconscious repression, and conscious denial (Fergusson et al., 2000).

Recall problems are of two types: limitation in recall and recall bias (Rothman, Greenland, & Lash, 2008). It is a normal process that individuals forget past events over time (autobiographical memories) including childhood maltreatment. It is also possible that participants simply do not have the information requested. If a limitation of recall regarding the exposure to child maltreatment affects all participants in a study to the same extend, no bias is introduced; however, a random misclassification of binary exposure status is still possible that results in underestimates of true association. Recall bias may arise if individuals with adverse health outcomes are likely to remember their experiences differently from those who are not similarly affected; this introduces biased estimates.

One possible mechanism of occurrence of recall bias in child maltreatment research is that certain characteristics of exposure to maltreatment may lead to

both differential recalls of maltreatment and differential health outcomes. For example, it is possible that more severe maltreatment tends to be remembered and perceived as exposure, and reported in the self-administered survey than less severe maltreatment (Hamby & Finkelhor, 2000). If the same characteristics of exposure to child maltreatment lead to both an increased likelihood of report of child maltreatment and adverse health outcome, this may result in an inflated association. To minimize the subjective interpretation of exposure to maltreatment, the use of behaviour specific questions (i.e., "I was hit" rather than "I was physically abused") is recommended in a self-report measure of child maltreatment (Hamby & Finkelhor, 2000).

The association between early age of exposure to SA and *recovered memory* has been consistently reported in studies based on both clinical (Briere & Conte, 1993; Gold, Hughes, & Swingle, 1999) and non-clinical samples (Epstein & Bottoms, 1998). Recovered memory refers to memory that is not remembered in childhood but recovered in adolescent or adulthood (Crowley, 2008). The exact mechanisms involved in the forgetting of memories, whether it be repression, suppression, dissociation, denial, or some other phenomenon, are not clearly understood (Colangelo, 2009). Although there are no standard measures to classify this type of memory, an example of questions asked to determine the nature of a memory among those exposed to SA may start with "*Did you always remember the abuse from the time(s) at which it occurred to the present?*" to answer yes/no, and then further ask them to identify, if possible, the approximate

age when they began to experience recovered memories (Crowley, 2008) In a prospective study of women with histories of childhood SA, Williams (1994) found that in addition to early age of onset, knowing the abuser was also associated with having forgotten the abuse (Williams, 1994).

Some authors have suggested that depressed individuals selectively recall negative experiences and thus exaggerate experiences of childhood adversity (Brewin, Andrews, & Gotlib, 1993). Overall, available evidence to date suggests that memory for childhood maltreatment is not influenced by current mood in either clinical or nonclinical samples (Brewin et al., 1993; Maughan & Rutter, 1997). The relation between current psychiatric problems and recovered memory is also inconclusive. Some clinical studies have found that current psychological problems such as PTSD, anxiety, and depression were associated with recovered memory (Briere & Conte, 1993; Elliott & Briere, 1995), whereas others have not found this to be the case (Epstein & Bottoms, 1998; Williams, 1994).

The association between recovered memory and other abuse characteristics -- severity, duration, number of perpetrators -- is inconclusive. In a clinical sample, Briere and Conte (1993) found significant associations between recovered memories for SA, versus memories of SA remembered throughout, and abuse that was severe, of longer duration, and involved a higher number of perpetrators (Briere & Conte, 1993). However, several studies involving both clinical (Crowley, 2008; Gold et al., 1999) and non-clinical (Elliott & Briere,

1995; Epstein & Bottoms, 1998; Williams, 1994) samples have consistently found no association between these three characteristics with memory type.

Overall, studies examining the extent of recall bias associated with retrospective evaluation of child maltreatment have generally concluded that this approach still tends to underestimate, rather than overestimate, the prevalence of child maltreatment (Fergusson et al., 2000; Widom & Shepard, 1996; Widom & Morris, 1997; Williams, 1994). In a prospective study of women with a history of SA, Williams (1994) reported that 38% did not recall the abuse (Williams, 1994). Given the tendency of underreporting child maltreatment, the important question is whether underreporting is associated with some systematic bias within study samples. If there is differential underreporting, this will distort the estimate of abuse effects. Some studies have reported possible sex differences in reporting sexual abuse. In a study of children of low-SES mothers, Shaffer et al (2008) found that while there was no sex difference in prospective measures of child sexual abuse, there was a sex difference in retrospective self-reports; more females than males reported sexual abuse (Shaffer, Huston, & Egeland, 2008).

Recall problems of childhood maltreatment is complex. Rigorous methods of child maltreatment research including the measurement of maltreatment need to consider strategies to minimize the recall bias. Some researchers suggested a strategy to administer multiple measurements of child maltreatment at different time points to improve the measurement (Fergusson et al., 2000).

1.8.3. Shared variance

Shared variance occurs when two types of data share the same methodological aspects such as mode of administration, informant, or timing of data collection; this may inflate the association between two measures (Streiner & Norman, 2003). In a study where a retrospective self-report is used for both exposure (child maltreatment) and outcome assessment, it may increase the shared variance and lead to inflated estimates.

1.8.4. Study design

Community-based studies of child maltreatment and associated impairment often use one of two study designs: prospective cohort study or crosssectional study. Although child maltreatment may be measured by retrospective self-report in both types of studies, these study designs are substantially different in some aspects (Rothman, Greenland, & Lash, 2008). First, the time and cost required to conduct a prospective study is generally much greater than for a crosssectional study, as it requires follow-up of study participants, often for many years and collection of data at multiple occasions.

Second, even though both involve community-based samples, crosssectional studies introduce potential bias in the responding samples (sampling bias). Samples of the cross-sectional studies represent individuals who are relatively healthy and well-functioning (i.e., not residing in jails, institutions, or on street). On the other hand, prospective longitudinal studies permit researchers

to follow representative sample of children into the future, regardless of their successes, failures, or deaths along the way (Widom, Raphael, & DuMont, 2004).

Third, a prospective study with multiple time points is able to obtain information about different age groups such as academic, mental, physical, and behavioural factors across a range of times. A cross-sectional sample may include a broad range of age groups, but they are only surveyed at one point in time. In the latter study, the collection of early developmental and family factors may be limited or based on recall by participants. The quality of information obtained from different types of informants and the timing of measurement may affect the findings of these studies differently.

Fourth, because prospective studies follow the original participants for many years, this type of study is more likely to experience sample loss (Rothman, Greenland, & Lash, 2008). It is essential with such a study design to consider ways to reduce attrition.

Finally, prospective and cross-sectional studies produce different types of estimates. In prospective studies, it is possible to examine the temporal relationship between exposure variables and outcomes, and test for causality. In cross-sectional studies, all estimates are associations (Kraemer, 2010).

1.8.5. Confounders

Use of a prospective design is methodologically superior to a crosssectional or retrospective cohort study design, as it minimizes the selective inclusion of participants on the basis of the outcome, and provides an opportunity

to measure and adjust for social and individual confounding factors as they occur (Gilbert et al., 2009a).

In child maltreatment research, as discussed in earlier sections, there are other co-exiting adversities that may relate to child maltreatment and associated impairment. It is necessary to account for the effects of confounders in these studies. Between prospective and cross-sectional studies, the measurement of early contextual factors may be conceptually different, as informants and timing of these assessments differ. For example, childhood behavioural problems are known predictors of adolescent and adult health impairment. In prospective studies, child health, academic performance and other functional variables are assessed by mothers or teachers; whereas these are often not available or are obtained from participants who rely on retrospective recall in cross-sectional studies. Despite substantial differences between prospective and cross-sectional studies as outlined above, the influence of overall design effect on study findings has not been clear.

In summary, this review of the child maltreatment literature provided an overview of epidemiology and methodological issues for each of the three main objectives in this thesis. In the area of definition and measurement of child maltreatment, more work is required to evaluate the utilities of self-report measurement of child maltreatment. In the area of consequences of exposure to child maltreatment, although associations of child maltreatment and psychological and physical impairment have been recognized, other aspects of quality of life

such as work-related functioning in young adults have been understudied. Recall bias associated with retrospective self-reports of child maltreatment and a lack of consideration of confounders in analyses has been major methodological issues in child maltreatment research. Despite the distinctive features of the two study designs used most often - prospective and cross-sectional designs - the potential effects of these design differences on study findings have been under-investigated. In the following three chapters, each of the three studies considers these issues.

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PhD Thesis M. Tanaka, McMaster - Health Research Methodology

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PhD Thesis M. Tanaka, McMaster - Health Research Methodology

Chapter 2: Preliminary Evaluation of the Childhood Experiences of Violence Questionnaire Short Form

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Abstract

Despite advances in child maltreatment research, measurement remains a key issue. In this study, we evaluated a short form (CEVQ-SF) of the Childhood Experiences of Violence Questionnaire (CEVQ) in a sample of adolescents involved with child protection services in an urban city in Ontario, Canada. Focusing on the two most readily defined maltreatment types, physical and sexual abuse, we evaluated the short form's comparability with the full version of the CEVQ. Both versions had good internal consistency and moderate to good twoweek test-retest reliability. The agreement of the two CEVQ versions in comparison with the Childhood Trauma Questionnaire in classifying physical and sexual abuse was satisfactory. Construct validity for both versions was demonstrated: physically and sexually abused youth had higher odds of reporting clinical level of traumatic symptoms compared with either type alone. The CEVQ-SF is as reliable and valid as its full version. Implications for its use in large population-based surveys are discussed.

Introduction

Although investigation into the distribution and determinants of child maltreatment has increased over the past two decades, the measurement of physical abuse (PA), sexual abuse (SA), emotional abuse (EA), and neglect remains a key issue (Cicchetti & Toth, 2005; Gilbert et al., 2009). Official reports to child protection services underestimate the extent of the problem (MacMillan, Jamieson, & Walsh, 2003) and tend to focus on the primary category of maltreatment (Hamby & Finkelhor, 2000). Community-based data capture victimization that has not been otherwise reported (Gilbert et al., 2009); however, maltreatment questions are often limited in general health surveys to reduce respondent burden, or are untested prior to inclusion. In Canada, there has been resistance at the federal level to include questions about child maltreatment in surveys conducted to determine the distribution and determinants of children's mental and physical health. General health surveys typically involve samples from the adult population, where much more time has passed since the potential period of exposure to child maltreatment. This may increase the risk of recall bias. Adolescents, on the other hand, remain temporally closer to their childhood maltreatment experiences. Including maltreatment questions that are brief and valid in community-based surveys of youth can offer substantial advantages. Only a few questionnaires have been developed to ask youth about their victimization experiences.

The Juvenile Victimization Questionnaire (JVQ) is a 34-item questionnaire developed for youth aged 10 to 17 that measures a wide range of victimization in the previous year, such as child maltreatment, sexual assault, bullying and crime, among others. The length of the JVQ severely limits its utility in general health surveys, and despite this length, PA, EA, and neglect are assessed with only a single item each (Finkelhor, Hamby, Ormrod, & Turner, 2005). Although the JVQ has shown good test-retest reliability and associations with traumatic symptoms (Finkelhor et al., 2005), it has been used exclusively for telephone surveys to date.

More recently, the Childhood Experiences of Violence Questionnaire (CEVQ) was developed for community-based studies of youth aged 12 to 18 years (Walsh et al., 2008). The CEVQ uses 18 stem questions which are behaviorally-based in order to increase validity (Hamby & Finkelhor, 2000). It measures bullying (2 items), physical punishment (spanking, 1 item), PA (6 items), SA (6 items), EA (1 item), and exposure to domestic violence (2 item). The CEVQ includes additional 64 questions to ask about context (i.e., developmental stages of occurrence of abuse, perpetrators, and help-seeking behaviors). It does not include neglect, as this type of maltreatment was considered too difficult to assess in a brief questionnaire, given its considerable variation across development, from failure-to-thrive in infancy to inadequate shelter provision in adolescence. The first validity study conducted with youth from community (school), clinical, child welfare, and justice settings showed that

the full CEVQ had good test-retest reliability and fair to good criterion validity for PA and SA (Walsh et al., 2008).

The short form of the CEVQ (CEVQ-SF) is a 7-item version with associated items asking about developmental stages of occurrence of each abuse. It was developed to reduce response burden while retaining the psychometric properties and obtaining the same information as the full version. It measures bullying (2 items), physical punishment (spanking, 1 item), and the two most readily identifiable maltreatment types, PA (3 items) and SA (1 item). It was pretested for the measurement of PA and SA in volunteer parents (n = 66, 67%females, ages 19-42 years) before its inclusion in the Ontario Child Health Study (Boyle, Georgiades, Racine, & Mustard, 2007). It showed test-retest reliabilities (kappas) of 0.56 for PA, 0.72 for severe PA, and 0.63 for SA (Racine & Boyle, unpublished data). This study is the first full evaluation of the short form, necessary before it can be recommended for inclusion in a large, cross-sectional or longitudinal population-based surveys aimed at measuring health and its correlates in children and youth.

Methods

Participants

Participants in this study are part of the Maltreatment and Adolescent Pathways (MAP) longitudinal study that began collecting data in September 2002 (Wekerle et al., 2009). They were randomly selected from active child protection

services (CPS) cases between age 14 and 17 from an urban centre's catchment area in Ontario, Canada. After cases were randomly selected from each CPS branch, the worker affiliated with each youth determined the eligibility of youth for participation. These youth have higher rates of maltreatment and this introduces efficiencies in sample size for this preliminary evaluation of the measure; community-based samples would have to be many times larger to obtain the same amount of data on maltreatment.

Youth were ineligible if they were not in contact with the CPS caseworker, were discharged from care at the time of referral, had a severe developmental delay, had severe psychological health issues (i.e., actively suicidal or psychotic episode) or were in secure custody or an inpatient treatment program. The initial recruitment rate was 70% of all eligible youth.

Procedure

Ethics approval was obtained from all participating CPS agencies, as well as University-based ethics boards. All MAP research team members and researchers who accessed the data signed confidentiality agreements with participating CPS agencies. All participants provided informed consent or assent for those aged under 16.

At intake to the MAP study, four self-report questionnaires, used for the purpose of this study, were administered: The CEVQ, CEVQ-SF, Childhood Trauma Questionnaire (CTQ), and Traumatic Symptoms Checklist for Children

(TSCC). The MAP study started collecting data in a paper-and-pencil format, and then made a transition to an electronic data collection using laptop administration. More than half the study data were collected in a paper-and-pencil format¹.

The initial data were collected from 369 youth. A subset of participants who were recruited into the MAP study during the period November 2006 to May 2008 was involved with the two-week retest of the CEVQ (n = 63) and CEVQ-SF (n = 36). Details of the MAP study methods can be found elsewhere (Wekerle et al., 2009).

Measures

Childhood Experiences of Violence Questionnaire (CEVQ, Walsh et al., 2008) and the short form (CEVQ-SF). Table 1 presents the short and long forms CEVQ and the algorithms to determine PA and SA. The stem question in the CEVQ reads "*How many times has an adult...*" in PA and "*How many times has anyone...*" in SA followed by abusive acts. The CEVQ-SF provides the timeframe in each stem question: "*How many times before age 16 did an adult...*". Generally speaking, the CEVQ-SF condenses several CEVQ items into one item. Respondents choose one of five responses for each question: Never, 1-2 times, 3-5 times, 6-10 times, and More than 10 times. PA and SA are determined by frequency on the CEVQ; if at least one item meets the minimum required frequency, then that case is classified as abuse. If at least one item meets the

¹ There was no statistically significant difference in report of child maltreatment and TSCC score between youth in a paper-and-pencil form and youth on a laptop administration.

minimum required frequency for severe abuse, the case is classified as severe abuse. The threshold of severity for PA in the CEVQ-SF was set to match the algorithms of the full version. The SA classification in the CEVQ-SF is based on one item that includes several abusive acts ranging in severity; therefore a "severe" SA classification is not possible. Both versions ask about the developmental stages when abuse occurred, although wording slightly differs. Options in the CEVQ-SF include "Before you began grade school?", "While you were in grade school?", and "While you were in high school?" (Table 1).

Table 1

Childhood Trauma Questionnaire (CTQ, Bernstein et al., 1994;

Bernstein et al., 2003). The extensively-validated CTQ was used for the criterion standard. Although the CTQ has not been validated specifically for a child welfare sample, it was chosen as a criterion, as the CTQ was the most comprehensive measure of childhood maltreatment. Originally developed in a clinical context, the CTQ is a 28-item self-report questionnaire that assesses history of PA, SA, EA, physical neglect, and emotional neglect (Bernstein et al., 1994; Bernstein et al., 2003). The CTQ has shown good criterion-related validity with therapists' ratings in an adolescent psychiatric population, and good convergent and discriminant validity (Bernstein et al., 2003). It has also shown measurement invariance of its factor structures across different groups and has been used in both clinical and community populations (Bernstein et al., 1994; Bernstein et al., 2003; Bernstein, Ahluvalia, Pogge, & Handelsman, 1997). The

CTQ uses a mix of behaviorally-anchored (e.g., I got hit or beaten) and interpretive questions (e.g., I was physically abused). It taps historical maltreatment without a specified timeframe, "While I was growing up". Each maltreatment type is assessed with five question items. For PA and SA, examples are, "I got hit or beaten so badly that it was noticed by someone like a teacher, neighbor, or doctor" and "Someone tried to touch me in a sexual way, or tried to make me touch them", respectively. For each statement, respondents are offered a 5-point scale (1 = never true to 5 = very often true). For the analysis, we created a binary abuse classification for PA, severe PA, SA, and severe SA based on the cut scores set by Bernstein et al. (1994) to determine the moderate and severe levels of maltreatment, respectively. The CTQ includes three minimization/denial items that reflect a tendency toward a socially desirable responses, for example, "There was nothing I wanted to change about my family". A response of "very often true" was coded 1 and all other responses were coded 0.

Traumatic Symptoms Checklist for Children (TSCC, Briere, 1996). The TSCC was administered to assess construct validity, based on the hypothesis that youth exposed to child maltreatment would endorse increased frequency of traumatic symptoms (Finkelhor, Hamby, Ormrod, & Turner, 2005). It is a 54item self-report measure of posttraumatic symptomatology, in children and adolescents ages 8 or older, which includes the effects of child abuse and neglect,

other interpersonal violence, witnessing trauma to others, major accidents, and disasters. Participants respond to statements using a 4-point scale (0 = Never, 1 =

Sometimes, 2 = Lots of times, 3 = Almost all of the time). The TSCC has six clinical scales (anxiety, depression, posttraumatic stress, sexual concerns, dissociation, and anger) and two validity scales (under-response and hyperresponse). Raw scores are transformed into age- and sex-adjusted *T*-scores with a clinical cut-off of 65 (Briere, 1996), resulting in a binary measure. The TSCC scales were internally consistent in the standardization sample and exhibited reasonable convergent, discriminant, and predictive validity in normative and clinical samples (Briere, 1996; Sadowski & Friedrich, 2000). In terms of the validity scale, it is recommended that TSCC with an under-response *T*-score of 70 or higher or hyper-response *T*-score of 90 or higher be considered invalid (Briere, 1996). To assess construct validity, we used a binary measure to calculate the proportion of youth with a clinical level of traumatic symptoms.

Demographic questions. We collected data about demographic information, including age, sex, and ethnicity at the intake interview. Youth's CPS status included Crown wards (i.e., parental right legally terminated), community families/temporary care, Society wards (i.e., parental rights sharing agreement), and voluntary care arrangement. We measured the length of time in years the youth was involved with the CPS system in Ontario.

Data analysis

We calculated the lifetime prevalence of abuse using each measure. For both versions of the CEVQ, we assessed two-week test-retest reliability for PA,

severe PA, SA and severe SA (the CEVQ only) with Cohen's kappa, and internal consistency with Cronbach's alpha. To assess criterion validity, we calculated the agreement (kappa) between the CEVQ, CEVQ-SF and the CTQ for PA, severe PA, SA, and severe SA.

For the evaluation of construct validity, we examined the odds of meeting a clinical level of traumatic symptoms by youth classified by (1) abuse type, PA and SA, and (2) by the number of abuse type, either PA or SA or both types. For the first analysis, youth were classified into three groups: (a) no self-report of PA and SA, (b) self-report of PA, and (c) self-report of SA; (b) and (c) may overlap. For the second analysis, youth were classified into three mutually exclusive and collectively exhaustive groups: (a) no self-report of PA and SA, (b) self-report of either PA or SA, and (c) self-report of both PA and SA. Logistic regression was used to test for group differences in the odds of reporting a clinical level of traumatic symptoms; the reference group was (a) in both analyses. The logistic regression was conducted using the CEVQ, CEVQ-SF, and CTQ. We assessed underreporting style by validity scales embedded in two measures (TSCC and CTQ), and hyper-reporting by the TSCC. All analyses were conducted using SAS software (version 9.1; SAS Institute, Cary, NC).

Results

Participants in this study (45.8% male) had a mean age of 16.4 years (SD = 1.0) at intake. Youth-reported ethnic identity was 29% White, 24% Black, 3%

Latin American, 1% Aboriginal, 1% South Asian, 1% Arab/West Asian, 1% South East Asian, 33% Biracial/Multiracial and 7% other. With regard to CPS status, 63.6% were Crown wards, 5.0% were interim/temporary care, 15.2% were Society wards, and 16.3% were in community family/voluntary care arrangements. Youth were involved with CPS for an average of 5.8 years (range: 0.5-17 years, SD = 4.2).

The group of youth participating in the two-week test-retest reliability assessment of the CEVQ-SF had a mean age of 15.8 years (SD = 1.0). The CTQ scores of these youth were similar to that of all other participants.

Table 2

Table 2 presents the lifetime prevalence of maltreatment measured by the CEVQ, CEVQ-SF and CTQ. In this study sample, 44.0-55.2% of youth reported PA; female youth reported a significantly higher prevalence of PA than males on the CEVQ. SA was reported by 20.0-29.6% of study sample; female youth reported a significantly higher prevalence than males on all three measures. The majority of youth showed no minimization/denial reporting style (72%, minimization score = 0) on the CTQ; proportions were comparable to a sample of college students and adolescent psychiatric patients (Bernstein et al., 1994).

Table 3

Table 3 shows the two-week test-retest reliability of both versions of the CEVQ. The kappas of PA, severe PA, SA, and severe SA were moderate to good

with 0.61 or higher. Internal consistencies in the CEVQ were $\alpha = 0.89$ for PA and $\alpha = 0.90$ for SA; in the CEVQ-SF, $\alpha = 0.85$ for PA.

Table 4

Table 4 shows the agreement for PA, severe PA, SA, and severe SA (except for the CEVQ-SF) among the CEVQ, CEVQ-SF and CTQ. The agreement between the two CEVQ versions was good (ranging from 0.65 to 0.82 across abuse types). The agreement of the CTQ with the CEVQ-SF was slightly superior (0.52 to 0.69) to its agreement with the CEVQ (0.46 to 0.52).

Table 5 & Table 6

Tables 5 and 6 present the evaluation of construct validity. The first logistic regression analysis (Table 5) examined the group difference classified by the type of abuse in reporting clinical level of traumatic symptoms. The results based on the CEVQ classification showed that both PA group and SA group had odds ratio (OR) of greater than 1.0, indicating that youth in PA group and SA group are more likely to report clinical level of symptoms than youth without self-report of PA and SA. The analysis using the CEVQ-SF showed a similar trend of increased likelihood among abused youth of reporting clinical level of trauma symptoms compared to reference group; although OR was present only for four clinical outcomes due to inadequate cell size for other outcomes. The results with the CTQ showed the similar pattern of the CEVQ.

Table 6 presents the result of the second analysis for the construct validity. The number of reported abuse type was regressed on the likelihood of reporting

clinical level of trauma symptoms. The results of the logistic regression for the CEVQ classification showed that youth with both types of abuse had the highest OR for all six clinical domains, followed by the youth with a single type of abuse (PA or SA). The result of analysis using the CEVQ-SF showed a similar trend; although OR could be determined for only three clinical outcomes due to small cell size for other outcomes. The construct validity of the CTQ showed the same pattern of the highest ORs among youth with both types of abuse, following by the group of youth with report of either PA or SA. In terms of the validity scale, 26.6% and 3.7% of study youth were considered under- or hyper-responding, respectively, on the TSCC.

Discussion

This study demonstrates that the CEVQ and the CEVQ-SF are valid and reliable measures of exposure to PA and SA in adolescents involved with child welfare system. The CEVQ-SF minimizes potential respondents' burden by reducing the number of items from its full version, from 18 stem questions accompanied by 64 context items on the CEVQ to 7 stem questions and 7 questions on developmental timing on the short form. Both versions of the CEVQ showed comparable psychometric properties in classifying PA and SA. The lifetime prevalence of PA and severe PA on both versions were comparable. Although the prevalence of SA on the CEVQ was higher than the short form (29.6% vs. 20.0%), this seemed to reflect the inclusion of non-contact SA items

(i.e., show their private parts, make you show them yours) in the CEVQ that was not included in the CEVQ-SF. The exclusion of SA cases in which only noncontact SA was identified on the CEVQ (n = 33) resulted a lifetime SA prevalence of 20.7% on the CEVQ. Both versions had good internal consistency and moderate to good two-week test-retest reliability. The criterion validity of the two CEVQ versions in comparison with the CTQ was satisfactory.

As hypothesized, examination of construct validity of the CEVQ showed that either physically or sexually abused youth had increased odds of reporting clinical level of traumatic symptoms compared with those who did not report exposure to PA and SA. Furthermore, the youth experiencing both PA and SA as classified by the CEVQ, had increased odds of reporting clinical level of traumatic symptoms compared with those who reported only one type or neither type of abuse. These results suggest the dose-response relationship between the increased number of abuse types and increased likelihood of meeting clinical level of traumatic symptoms in all six clinical domains. Although the analysis of the CEVQ-SF was based on a smaller sample, it showed patterns similar to the full version. The same dose-response relationship was observed in analyses using abuse classifications by the CTQ.

This study has some limitations. The sample sizes for studying the CEVQ-SF and for estimating the test-retest reliability of the CEVQ were small. Although construct validity estimates for the CEVQ-SF based on its association with trauma symptoms exhibited a trend similar to that of the CEVQ, further

evaluation with a larger sample would be desirable. This study included only self-report as an approach to measuring child maltreatment, given the underreporting that occurs with official CPS reports (MacMillan, Jamieson, & Walsh, 2003). Although the agreement between the two CEVQ versions and CTQ in classifying PA and SA was satisfactory, this may reflect a shared method of measurement -- self-report (Campbell & Fiske, 1959). There was a significant correlation between under-response scores in the TSCC and minimization/denial scores in the CTQ in study youth (r = 0.26, p < .001). We also found that underresponding in the TSCC was associated with a "no PA and SA" classification based on the CEVQ and CTQ. However, in measuring both maltreatment and trauma symptoms, over-reporting did not seem to be a risk among CPS-involved youth. The likelihood of underreporting versus over-reporting seen in our study is consistent with other findings, suggesting that underreporting of exposure to child maltreatment occurs when such exposure is assessed retrospectively (Fergusson, Horwood, & Woodward, 2000).

In summary, this preliminary evaluation of the short form of the CEVQ demonstrated reliability and validity comparable to the full version. Since the CEVQ full version was developed using community as well as clinical samples, the CEVQ-SF is useful in measuring the prevalence of PA and SA in community samples of youth. As outlined by Gilbert and colleagues (2009), it is important to have accurate estimates of exposure to child maltreatment and ways of collecting information about its correlates. Such data are crucial in determining risk and

protective factors, and trends in child maltreatment occurrence over time. This information can then form the basis for evaluating the effectiveness of interventions, especially those policies implemented with the goal of reducing child maltreatment. Evaluating the psychometric properties of child maltreatment measures is the first step in providing valid and reliable information about the extent of maltreatment. PhD Thesis M. Tanaka, McMaster – Health Research Methodology

2.1. Tables

Table 1 Items and Minimum Required Frequency for Physical and Sexual Abuse and the Severe Forms Measured by the CEVQ and the CEVQ-SF

	CE	Ŋ		CEV	Q-SF
	Minimum Freque	Required ncy for:		Minimurr Freque	n Required ncy for:
"How many times has an			"How many times before		
adult"	PA	Severe PA	age 16 did an adult"	PA	Severe PA
1. slapped you on the face,	3-5 times	>10 times	1. slap you on the face, head	3-5 times	>10 times
head or ears or hit or			or ears or hit or spank you		
spanked you with something			with something like a belt,		
like a belt, wooden spoon or			wooden spoon or something		
something hard?		-	hard?		
2. pushed, grabbed, or	3-5 times	>10 times	2. push, grab, shove or	3-5 times	>10 times
shoved you to hurt you?			throw something at you to		
3. thrown something at you	3-5 times	>10 times	hurt you?		
to hurt you?					
4. kicked, bit, or punched	1-2 ti	imes	3. kick, bite, punch, choke,	1-2 t	imes
you to hurt you?			burn you, or physically		
5. choked, burned or	1-2 ti	mes	attack you in some way?		
physically attacked you in					
some other way?					

[Physical abuse]

		[Sexual ab	use]	
	CEV	Q		CEVQ-SF
	[Minimum]	Required		Minimum Required
	Frequence	cy for:		Frequency for:
"How many times has			"How many times before	
anyone"	SA	Severe SA	age 16 did anyone"	SA
1. show their private parts to	3-5 times	6-10 times		
you when you didn't want				
them to?				
2. make you show them your	yes	3-5 times		
private parts when you did not				
want them to?				
3. threaten to have sex with	yes	3-5 times	1. do any of the following	yes
you when you did not want			things when you didn't	
them to?			want them to: touch the	
4. touch the private parts of	ye	S	private parts of your body	
your body or made you touch			or make you touch their	
their private parts when you			private parts, threaten or	
did not want them to?			try to have sex with you or	
5. have sex with you when you	ye	S	sexually force themselves	
didn't want them to or sexually			on you?	
force themselves on you in				
some other way?				
Note: CEVO – Childhood Evneriano	O equalor of Violance O	U actionnaire	EVO SE – Short Form of the CEV	DA - Abricional and C
				A I A - purporent average
SA = Sexual abuse.		1		
BOIN CEVU VERSIONS ASK ADOUL LIE U	evelopmental sta	ge when abuse	happened for each question hem.	The CEVU asks

PhD Thesis M. Tanaka, McMaster - Health Research Methodology

developmental stages: "Before grade school", "In grade 1-5", "In grade 6-8", "In high school", or "Happening now". The CEVQ-SF asks developmental stages: "Before you began grade school?", "While you were in grade school?", or "While you were in high school?", or "While you

•

	CEVQ	CEVQ-SF	CTQ ^a
	<i>n</i> = 369, %	<i>n</i> = 55, %	<i>n</i> = 369, %
Physical abuse	55.2*	54.4	44.0
Severe physical abuse	47.0	45.5	30.5
Sexual abuse	29.6*	20.0*	22.3*
Severe sexual abuse	25.0*		12.5*
Emotional abuse			38.9*
Severe emotional abuse			26.1*
Emotional neglect			43.7*
Severe emotional neglect			27.7
Physical neglect			45.2
Severe physical neglect			24.4

Table 2 The Lifetime Prevalence of Maltreatment Type Measured by the CEVQ, CEVQ-SF, and CTQ

Note: CEVQ = Childhood Experiences of Violence Questionnaire, CEVQ-SF = Short Form of the CEVQ, CTQ = Childhood Trauma Questionnaire.

* Females had significantly higher prevalence than males at p < .05.

^a Abuse and its severe form were determined by cut scores set by Bernstein et al. (1994) for moderate and severe level of maltreatment, respectively.

Table 3 Two-Week Test-Retest Reliability Kappa Coefficient for Classification for Physical and Sexual Abuse and Severe Forms of Abuse Measured by the CEVQ and the CEVQ-SF

	CEVQ	CEVQ-SF
	Kappa 95% CI <i>n</i> = 63	Kappa 95% CI, <i>n</i> = 36
Physical abuse	0.80 [0.64, 0.95]	0.61 [0.36, 0.87]
Severe physical abuse	0.70 [0.52, 0.88]	0.72 [0.50, 0.95]
Sexual abuse	0.73 [0.54, 0.91]	0.91 [0.75, 1.00]
Severe sexual abuse	0.68 [0.47, 0.88]	

Note: CEVQ = Childhood Experiences of Violence Questionnaire, CEVQ-SF = Short Form of the CEVQ.

		CEVQ-SF	CEVQ
		Kappa 95% CI	Kappa 95% CI
Physical abuse	CEVQ-SF		
	CEVQ	0.82 [0.66, 0.97]	
	СТQ	0.69 [0.50, 0.89]	0.52 [0.44, 0.61]
Severe physical abuse	CEVQ-SF		
	CEVQ	0.81 [0.66, 0.97]	
	CTQ	0.52 [0.30, 0.74]	0.46 [0.38, 0.55]
Sexual abuse	CEVQ-SF		
	CEVQ	0.65 [0.42, 0.88]	
	CTQ	0.69 [0.46, 0.91]	0.52 [0.42, 0.61]
Severe sexual abuse	CEVQ-SF		
	CEVQ		
	CTQ		0.50 [0.39, 0.60]

Table 4 Agreement on Classification for Physical and Sexual Abuse and Severe Forms of Abuse between the CEVQ, CEVQ-SF, and CTQ

Note: CEVQ = Childhood Experiences of Violence Questionnaire, CEVQ-SF = Short Form of the CEVQ, CTQ = Childhood Trauma Questionnaire. PhD Thesis M. Tanaka, McMaster - Health Research Methodology

Table 5 Odds Ratio of Meeting Clinical Level of Trauma Symptoms of Youth Grouped by Abuse Type by the CEVQ, CEVQ-SF, CTQ

		CEVQ (n = 368)		0	EVQ-SF(n=5)	5)	0	TQ (n = 368)	
		OR 95% CI			OR 95% CI			OR 95% CI	
	No	PA	SA	No	PA	SA	No	PA	SA
	PA & SA	$(n = 203)^{a}$	$(n = 109)^{a}$	PA & SA	$(n = 31)^{a}$	$(n = 11)^{a}$	PA & SA	$(n = 62)^{a}$	$(n = 82)^{a}$
	(n = 142)			(n = 22)			(n = 185)		
Anxiety	(reference)	4.8	3.6	(reference)	n/a	n/a	(reference)	3.5	2.8
		[1.6, 14.2]	[1.7, 7.8]					[1.5, 8.3]	[1.3, 5.9]
Depression		4.5	2.0		2.8	2.3		2.6	2.8
		[1.9, 10.7]	[1.0, 3.8]		[0.3, 28.6]	[0.3, 17.2]		[1.3, 5.2]	[1.4, 5.4]
PTS		3.9	3.6		n/a	n/a		1.7	4.5
		[1.4, 10.7]	[1.7, 7.6]					[0.8, 3.8]	[2.1, 9.6]
Anger		1.9	2.3		0.4*	5.7*		1.7	2.0
		[0.7, 5.1]	[0.9, 5.7]		[0.0, 10.0]	[0.3, 129.1]		[0.7, 4.2]	[0.8, 5.0]
SC		3.2	3.3		2.2	2.4		2.5	2.4
		[1.5, 6.8]	[1.8, 6.1]		[0.4, 12.6]	[0.4, 12.7]		[1.3, 4.7]	[1.3, 4.5]
Dissociation		5.8	1.8		2.8	2.3		2.2	1.8
		[2.4, 14.4]	[0.9, 3.5]		[0.3, 28.6]	[0.3, 17.2]		[1.1, 4.3]	[0.9, 3.6]

Note: CEVQ = Childhood Experiences of Violence Questionnaire, CEVQ-SF = Short Form of the CEVQ, CTQ = Childhood Trauma Questionnaire, PA = physical abuse, PTS = posttraumatic stress, SA = sexual abuse, SC = sexual concerns. ^a PA and SA groups are not mutually exclusive.

n/a = not available. Anxiety: reference (n = 0), both PA & SA (n = 1). PTS: reference (n = 0), PA only (n = 1), both PA & SA (n = 2). *Anger: reference (n = 1), both PA & SA (n = 1). PhD Thesis M. Tanaka, McMaster - Health Research Methodology

o of Meeting Clinical Level of Trauma Symptoms of Youth Grouped by Number of Abuse Type by	SF, CTQ
Table 6 Odds Ratio of Meeting	the CEVQ, CEVQ-SF, CTQ

No Either Both No Either Difference Difference <thdifference< th=""> Differenc</thdifference<>			CEVQ (n = 368)		0	EVQ-SF $(n = 5f$	()		CIQ(n = 368)	
No Either Both No Either No Either $(n = 142)$ $(n = 140)$ $(n = 86)$ $(n = 22)$ $(n = 24)$ $(n = 9)$ $(n = 122)$ $(n = 142)$ $(n = 140)$ $(n = 86)$ $(n = 22)$ $(n = 24)$ $(n = 122)$ $(n = 122)$ $(n = 142)$ $(n = 142)$ $(n = 22)$ $(n = 22)$ $(n = 122)$ $(n = 122)$ $(1.0, 13.2]$ $[4.3, 52.0]$ $(n = 22)$ $(n = 22)$ $(n = 122)$ $(n = 122)$ $nession 11.3 12.4, 55.0] (n = 22) (n = 9) (n = 122) (n = 122) nession 11.7 12.6 3.4 1.9 (n = 122) (n = 122) (n = 122) nessin 12.4 9.4$			OR 95% CI			OR 95% CI			OH 95% CI	-
PA & SA PA or SA PA & SA PA or SA PA		NO	Fither	Both	No	Either	Both	No	Either	Both
(n=142) (n=142) (n=142) (n=142) (n=142) (n=122) <		DA & CA	PA or SA	PA & SA	PA & SA	PA or SA	PA & SA	PA & SA	PA or SA	PA & SA
xiety (reference) 3.6 15.0 (reference) 1.8 1.8 pression 3.6 15.0 (reference) 1.9 6.0 1.6 pression 4.6 9.4 1.9 6.0 1.6 2.7 11.9 0.2, 22.7 [0.5, 76.7] [0.7, 4.7 2.7 11.9 n/a n/a 1.2 2.7 11.9 n/a n/a 1.2 2.7 11.9 n/a n/a 1.2 2.7 11.9 n/a 1.2 [0.7, 3.5] 9er 0.4, 4.7 [3.9, 35.8] n/a 2.6 0.4, 4.7 [1.3, 12.0] n/a 2.6 0.8 3.0 10.3 5.5 6.0 1.8 0.3 3.0 10.3 5.5 6.0 1.8 1.8 11.7, 12.5 [3.4, 24.9] [0.6, 51.6] [0.5, 76.7] [0.9, 3.7] [0.9, 3.7] 11.7, 12.5 [0.4, 4.3, 24.9] [0.6, 51.6] [0.5, 76.		(n = 142)	(n = 140)	(n = 86)	(n = 22)	(n = 24)	(n = 0)	(n = 185)	(n = 122)	(n = 61)
pression 4.6 9.4 1.9 6.0 1.6 1.2	xietv	(reference)	3.6	15.0	(reference)	n/a	n/a	(reference)	1.8	8.6
pression 4.6 9.4 1.9 6.0 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.2 1.2 1.1.9 1.2 <th1.3< th=""> 1.3 1.3 <th1< td=""><td></td><td></td><td>[1.0, 13.2]</td><td>[4.3, 52.0]</td><td></td><td></td><td></td><td></td><td>[0.7, 4.7</td><td>[1.12, C.5]</td></th1<></th1.3<>			[1.0, 13.2]	[4.3, 52.0]					[0.7, 4.7	[1.12, C.5]
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S 2.7 11.9 n/a n/a n/a 1.2 1.9 $0.5, 32.9$ [0.6, 32.8] n/a 2.6 0.8 1.4 4.0 0.8 1.4 4.0 $0.4, 4.7$ [1.3, 12.0] 5.5 6.0 $1.4, 47.2$ [0.3, 2.6] 1.8 3.0 10.3 5.5 6.0 1.8 $0.9, 3.7$ [$0.3, 2.6$] 1.8 sociation 4.6 10.0 1.9 $0.6, 51.6$ [$0.5, 76.7$] 1.8 $0.9, 3.7$] [$1.2, 7.5$] $[3.6, 27.5]$ $[0.6, 51.6]$ $[0.5, 76.7]$ $[0.9, 3.7]$ [$1.2, 7.5$] $[3.6, 27.5]$ $[0.2, 22.7]$ $[0.5, 76.7]$ $[0.9, 3.8]$			[1.7.12.5]	[3.4. 26.0]		[0.2, 22.7]	[0.5, 76.7]		[0.7, 3.5]	[3.2, 15.0]
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sociation 4.6 10.0 1.9 6.0 1.8 [0.2, 22.7] [0.5, 76.7] [0.9, 3.8]			[1.2.7.5]	[4.3, 24.9]		[0.6, 51.6]	0.5, 76.7		0.3, 3.7]	[Z.3, 12.4]
11.7.12.51 [3.6, 27.5] [0.2, 22.7] [0.5, 76.7] [0.9, 3.8]			46	10.0		1.9	6.0		1.8	4.0
			[1.7, 12.5]	[3.6, 27.5]		[0.2, 22.7]	[0.5, 76.7]		[0.9, 3.8]	[1.9, 8.8]

Note: CEVQ = Childhood Experiences of Violence Questionnaire, CEVQ-SF = Short Form of the CEVQ, CTQ = Childhood Trauma Questionnaire, PA = physical abuse, PTS = posttraumatic stress, SA = sexual abuse, SC = sexual concerns.

Three abuse groups are mutually exclusive and collectively exhaustive. n/a = not available. Anxiety: reference (n = 0), either PA or SA (n = 0), both PA & SA (n = 1). PTS: reference (n = 0), either PA or SA (n = 1), both PA & SA (n = 2). Anger: reference (n = 1), either PA or SA (n = 0), both PA & SA (n = 1).

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PhD Thesis M. Tanaka, McMaster - Health Research Methodology

Chapter 3: The association between childhood abuse and labor force outcomes in young adults: Results from the Ontario Child Health Study

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Abstract

We examined the associations between child abuse and labor force outcomes in young adults and the possible mediating effects of education, current mental and physical health. Data from the Ontario Child Health Study (n = 1,893), a province-wide longitudinal study were analyzed. Controlling for childhood variables and demographics, severe physical abuse (PA) was significantly associated with reduced income; no sex difference was found. There was no association between child abuse and employment; however there was a significant interaction effect of sex and abuse. Severe PA was significantly associated with a lower likelihood of employment among males only. The effect of hypothesized mediators, education and adult health was minimal. Further studies should investigate possible mechanisms linking child maltreatment and economic vulnerability.

Keywords: sexual abuse, physical abuse, adult survivor, labor force

Introduction

Exposure to child maltreatment is associated with a wide range of impairments in biological, psychological, and social functioning (Cicchetti & Toth, 2005; De Bellis, 2001; Goodwin & Stein, 2004; Gilbert et al., 2009). The adverse consequences of child maltreatment have been reported across many developmental periods from young children to adolescents (Cicchetti & Toth, 2005). While there have been several cross-sectional surveys assessing functioning of young adults, few prospective studies have examined the association between exposure to child maltreatment and work-related activities.

The transition from adolescence to young adulthood is an important developmental stage where major role changes occur (Arnett, 2000). This period is conceptualized as the life stage where a person evaluates the nature of the world, establishes family and career, and attempts to build a better life (Arnett, 2000; Levinson, 1986). Self-esteem or self-worth is enhanced at this stage through many domains including intimacy, social competence, and as a provider (Harter, 1990).

Entering the labor force is one of the major transitions in young adulthood. Employment provides material benefits and enhances job-related skills and psychosocial functioning (Caspi, Wright, Moffitt, & Silva, 1998). Failure to make this transition may lead to serious problems such as psychological distress (Fergusson, Horwood, & Lynskey, 1997; Mossakowski, 2009; Winefield &

Tiggemann, 1990), decreased probability of future employment (Lynch, 1989), and reduced wages in later adulthood (Baker, Meredith, Elias, & Peter, 1991).

Prospective studies have identified early factors that predict poor labor force outcomes in young adults. These include a paucity of human capital (e.g., childhood socioeconomic status, education), social capital (e.g., family relationships, school life) and personal capital (e.g., mental health, physical health, behavioral problems, substance abuse) (Caspi et al., 1998; Virtanen, Kivimaki, Elovainio et al., 2005; Danziger, Kalil, & Anderson, 2000; Tam, Zlotnick, & Robertson, 2003). Caspi et al. (1998) reported that early personal and family factors may have both a direct and indirect effect through accumulation of human capital (e.g., education) on labor force outcomes.

Maltreated children may be at increased risk of a disrupted transition to the labor force. Child maltreatment often occurs in the context of other family adversities including poverty, dysfunctional family relationships, and family history of psychiatric disorders (Besinger, Garland, Litrownik, & Landsverk, 1999; De Bellis et al., 2001), placing children at increased risk for functional impairments in multiple domains, including poor educational achievement (Boyle, Georgiades, Racine, & Mustard, 2007). While the association between human and personal capital and labor force functioning is well recognized (Caspi et al., 1998; Taylor & Barusch, 2004; Virtanen, Kivimaki, Elovainio et al., 2005) the impact of child maltreatment on labor force outcomes is less known.

Few studies have explored the association between child maltreatment and labor force outcomes. A U.S. study of 632 females on welfare (ages 18 to 54 years) found a significant association between child sexual abuse (SA) and fewer months of work mediated by current mental and physical health (Lee & Tolman, 2006). Two studies examined the association between SA and adult earnings. One study (Hyman, 2000) of 1,889 lesbian women (ages 22 to 80 years) found significant associations between SA and physical and mental health impairment, lower education attainment, and decreased annual income. A study of 1,009 U.S. females (ages 18 to 54 years) identified a significant relationship between decreased income and SA among females who reported that the abuse affected their lives, but no association among those SA victims without such a report (Robst & Smith, 2008). A recent cross-sectional study of a U.S. representative sample found an association between child physical abuse (PA) or multiple types of maltreatment (PA, SA, severe neglect) and lower likelihood of employment and reduced household income (Zielinski, 2009).

While these studies provide insights into the possible impacts of child abuse on adult roles in the labor force, methodological concerns limit their generalizability. First, many of these studies are based on highly selective samples (e.g., welfare recipients, lesbians) which may include participants who are more likely than the rest of the population to have other factors that may influence labor force outcomes. Furthermore, available studies have mainly focused on females. Second, these studies as well as numerous others in child maltreatment have

examined the impact of a single abuse type, although co-occurrence of abuse types is common (Higgins & McCabe, 2001). Research has shown that exposure to multiple types of abuse and severity of abuse were both associated with increased psychological impairment (Clemmons, Walsh, DiLillo, & Messman-Moore, 2007; English, Graham, Litrownik, Everson, & Bangdiwala, 2005). Studies of a single abuse type may overemphasize the effect of abuse type on subsequent impairment. Third, there is a concern about potential misspecification of causal pathways between childhood adversities and adult outcomes due to lack of control for early influential factors (Higgins & McCabe, 2001; Kessler, GillisLight, Magee, Kendler, & Eaves, 1997). Maltreated children are at increased risk for subsequent impairment for many other reasons including genetic and family factors (Cicchetti & Toth, 2005), therefore studies that have not accounted for other early factors may overestimate the impact of child abuse on labor force outcomes. Additionally, it is unclear whether retrospective selfreport of early factors is comparable to factors prospectively measured. Finally, measures of child maltreatment in available studies were based on self-report without psychometric evaluation. Retrospective self-report measures provide better coverage of child abuse exposure than official reports of child abuse that are vulnerable to referral biases (MacMillan, Jamieson, & Walsh, 2003); however, validation of these measures is crucial to produce reliable results (Walsh, MacMillan, Trocmé, Jamieson, & Boyle, 2008).
We investigate the relationship between a history of child abuse (physical and/or sexual abuse) and (a) current employment status, and (b) annual personal income, using a large community sample of young males and females. We hypothesized that child maltreatment would show negative impacts on work outcomes, controlling for childhood and family variables, and these effects would be mediated by educational attainment, and current physical and mental health (Figure 1). We also predicted that severe abuse would have a greater effect on outcomes compared with non-severe abuse. To explore a possible moderating role of sex, we test for statistically significant differences between males and females in the association between child maltreatment and labor force outcomes.

Figure 1

Methods

Participants

This study uses data from the Ontario Child Health Study (OCHS), a longitudinal study of child health that collected baseline data in 1983 from 3,294 children aged four to 16 years in 1,869 families, that was 91.1% of the eligible sample (Boyle, Offord, Hofmann, & Catlin, 1987; Offord, Boyle, Szatmari, & Rae-Grant, 1987). The sampling unit was all households listed in the 1981 Canada Census, and sample selection was conducted by stratified, clustered and random sampling. The second wave of data was collected in 1987 and the third in 2000-2001. By 2001, 29 of original participants either died (n = 26) or were institutionalized, leaving 3,265 adults who were then between 21 and 35 years of age. During the most recent follow-up in 2001, 2,355 participated in a survey, of which 1,928 completed all questionnaires. Of those, 98% completed the retrospective self-report about child abuse, giving the final sample of 1,893 males and females. For analysis of personal income, a subset of 1,616 participants who were employed in the past 12 months was included. There were 162/1,616 (10%) participants who did not answer the personal income question; exclusion of these participants left 1,454 for the income analysis. This study used data from 1983 and 2001. Further details about the OCHS data have been reported elsewhere (Boyle, Offord, Hofmann, & Catlin, 1987; Boyle, Georgiades, Racine, & Mustard, 2007).

Measures

Child maltreatment was assessed in 2001 with a modified set of questions from the Childhood Experiences of Violence Questionnaire (CEVQ), that measures retrospective self-reports of physical and sexual abuse (PA, SA) in childhood (Walsh et al., 2008; Wekerle, Miller, Wolfe, & Spindel, 2006). PA includes three items: "How many times before age 16 did an adult ... (1) *slap you on the face, head or ears or hit or spank you with something like a belt, wooden spoon or something hard?* (2) *push, grab, shove or throw something at you to hurt you?* (3) *kick, bite, punch, choke, burn you, or physically attack you in some way?*" Participants were asked to choose one of: never, 1-2 times, 3-5 times, 6-10 times, 10+ times. PA was present if item (1) or (2) happened at least 3-5 times, or item (3) happened at least 1-2 times (0 = absent, 1 = present). Severe PA was

present if item (1) or (2) occurred "more than 10 times" or the item (3) occurred at least "3-5 times" (0 = absent, 1 = present). SA was assessed by one item, "Before age 16 when you were growing up, did anyone ever do any of the following things when you didn't want them to: touch the private parts of your body or make you touch their private parts, threaten or try to have sex with you or sexually force themselves on you?." Because the SA classification is based on one item that includes several abusive acts varying in severity, SA is a binary measure without a severity classification; therefore, any response except "never" was considered exposure to SA (0 = absent, 1 = present). All other responses that did not meet these categories were classified to 'no abuse' group. In clinical and community adolescent samples, the original CEVQ has shown good two-week test-retest reliability (kappa for PA, severe PA, SA, and severe SA were .85, .77, .92, and .87, respectively) and fair to good criterion validity (kappa = .67, .64, .70, .50, respectively) in comparison with clinician's report (Walsh et al., 2008; Wekerle, Miller, Wolfe, & Spindel, 2006). The modified version of the CEVQ that was used for this study showed a good internal consistency ($\alpha = .76$) in study sample.

Educational attainment was assessed by the number of years of education. Current physical health and mental health were measured with the component summary scores of the SF-36 Health Survey ($\alpha = .88$), a valid and reliable measure of global mental and physical health and well-being (Brazier et al., 1992; Ware, Kosinski, & Keller, 1994). The higher scores indicate better health. The physical component summary scores (M = 52.97, SD = 6.92, range: 9.56 to 70.74)

and mental component summary scores (M = 52.58, SD = 7.94, range: 11.34 to 71.70) were re-scaled to have a mean of 0.0 for analyses.

Employment was based on Statistic Canada's definition of labor force status. Employment status was coded "1" if a participant was employed at some point in the last 12 months and "0" if a participant was unemployed or not in the labor force over the past 12 months. The variable does not reflect hours of work (i.e., full-time or part-time) or a transition in work (i.e., full-time to part-time or vice versa). Annual personal income was the sum of wages, salary, and selfemployment net income; other income sources such as employment insurance benefit, child tax benefit, social welfare, and interest were excluded. Annual income, instead of hourly wage, was used in order to reflect income loss due to changing jobs, absenteeism, sick leaves or other indications of poor job attachment that are possibly related to mental and physical conditions.

Other control variables were included in the analysis based on their documented association to work outcomes. Full-time student status is a binary variable (0 = part-time student or non-student, 1 = full-time student). In the OCHS sample, the proportion of full-time students who were employed (58%) in 2001 was significantly different from that of part-time students (85%) and non-students (88%). Based on this difference, we decided to classify full-time student status as the variable of interest and combined part-time and non-student as the reference group. Participants' age in 2001 is a continuous variable. Sex (0 = male, 1 = female), marriage-like relationship (0 = not currently married, 1 = male.

married or common-law), and an interaction between sex and marital status were included, as marital status is known to influence the income of males and females differently (Galarneau & Earl, 1999).

Childhood variables assessed in 1983 were included in the analysis to control for the effects of educational attainment, physical and mental health that are attributable to childhood factors other than abuse. The four binary measures of childhood variables are the presence (1 = yes) or absence (0 = no) of: (1) a functional limitation, (2) a psychiatric disorder, (3) an interpersonal relationship problem, and (4) a grade repetition in school. Functional limitation was based on parental report of presence or absence of one or more limitations in physical activity, mobility, or self-care due to an illness, injury, or medical conditions, and/or a limitation in role performance for more than six months. A child was classified with a psychiatric disorder (one or more of conduct disorder, attentiondeficit disorder, and emotional disorder) based on problem checklist assessments obtained from mothers and teachers (for children aged 4-11 years) and mothers and youth (for adolescents aged 12-16 years). These checklists were developed to screen for psychiatric disorders among children in the general population (Boyle et al., 1987; Offord, Boyle, Szatmari, & Rae-Grant, 1987). A child was classified with an interpersonal relationship problem if either informant responded to any one of three questions "during the past six months, how well has ____ gotten along with others such as friends or classmates; his/her teachers at school; the family?" with the two highest ratings on 5-level frequency of problems: from "no problem"

PhD Thesis M. Tanaka, McMaster - Health Research Methodology

to "constant problems" A child was classified as repeating a grade if mothers answered yes to the question: "has ____ ever repeated or failed a grade?" (0 = no, 1 = yes).

Two family background variables assessed in childhood are: (1) a binary indicator of parental history of psychiatric treatment (0 = no, 1 = yes for either parent ever treated for "nerves") to control for possible influences of genetic and dysfunctional family relationships on later health and functioning (Herr, Hammen, & Brennan, 2007; Weissman et al., 2006), and (2) childhood socioeconomic status (SES). SES is a composite measure derived from three variables that were standardized and added together: family income, parental years of education, and occupational prestige. The six childhood variables were collected in 1983, and all other information was collected at follow-up in 2001.

Statistical Analysis

PA was classified into three mutually exclusive and collectively exhaustive categories: no PA, non-severe PA, and severe PA. SA was classified as no SA versus SA. In all multiple regression analyses, three dummy variables that represent three subgroups of child abuse were entered simultaneously: (1) severe PA, (2) non-severe PA, (3) SA, with "no PA and SA" as a reference group, to show the effect of child abuse on the outcome.

Multi-level linear and logistic regression analyses were used for the main analysis to take into account the data structure where participants were nested within households. More than one third of the sample had at least one sibling also

participating in the study; multi-level analysis partitions response variability between versus within families, taking into account response dependencies (i.e., family clustering).

A number of key variables in the OCHS (e.g., SES, child, parent, and family functioning) were associated with sample attrition. Boyle et al. (2006) created attrition weights using weighted complete-case analyses (Little & Rubin, 2002). These weights successfully recaptured the original sample characteristics. Sampling weights were devised for the first wave based on the probabilities of selection and enlistment. We applied attrition and sampling weights for all the regression analyses.

We used MLwiN (Rasbash, Steele, Browne, & Goldstein, 2009) for the multi-level regression analyses. For multiple linear regressions, we used iterated generalized least squares estimation. For multiple logistic regression, we used first-order marginal quasi-likelihood. SAS version 9.1.3 (SAS Institute Inc., Cary, NC) was used for all other analyses.

Results

About half the OCHS sample was males (49%), more than half (53%) the overall sample was married, and the mean years of education was 15.2 years with a range of eight to 27 years. Overall, more males (32.7%) reported PA than females (26.9%, p < .01), and more females (21.0%) reported SA than males (8.0%, p < .001); there was no sex difference in exposure to severe PA (Figure 2).

About 85% of the OCHS sample reported being employed within the last 12 months, and the median annual personal income among those employed was 32,000 CAD, ranging from 5,437 to 570,000. The distribution of personal income in the study sample was skewed to the lower end; therefore the natural logarithm (log) of income was used to better approximate a normal distribution. Log of income provides the percentage change in annual income due to the effects of child abuse (*eB* - 1).

Figure 2

Tables 1 and 2 show the descriptive statistics examining the characteristics of participants by abuse classification for PA and SA, respectively. Standardized differences between the abuse and no abuse group on each variable were examined. Medium-sized effects (d > 0.40) were found between the no PA and severe PA group and between the no SA and SA group for SF 36 mental health; all other effect sizes were small.

Tables 1 and 2 also show the results of multivariate analysis of variance (MANOVA) that examine the overall difference between abuse classification for each abuse type in regard to demographic, childhood, and labor force outcome variables. There was a significant overall difference across the three PA classifications. This was also the case for SA. Post hoc analysis for group differences within PA categories showed the statistically significant difference in education, mental health, and employment (participants reporting severe PA were poorer than those with non-severe PA), age (non-severe PA older than no PA),

and childhood psychiatric disorders (non-severe PA more likely to have disorders than no PA). Post hoc analysis for SA showed statistically significant difference in education, mental and physical health, and family SES (SA poorer than no SA), age (SA older), and parent treated for nerves, and interpersonal relationship problems (SA more likely to have problems than no SA).

Tables 1 and 2

Table 3 shows the bivariate associations between measured variables. Severe PA was associated with a greater number of childhood adversities and poorer young adult function variables (e.g., education, labor force) compared to non-severe PA. SA was also associated with a wide range of childhood adversities and adverse young adult outcomes. However, these correlations were small (i.e., -0.3 < r < 0.3).

Table 3

The role of hypothesized mediators (educational attainment, current physical and mental health) in the association between child abuse and labor force outcomes was assessed using the approach recommended by Baron and Kenny (Baron & Kenny, 1986). First, the years of education, physical health, and mental health were regressed separately on child abuse (Figure 1, $A \rightarrow B$); second, each labor force outcome was regressed on the years of education, physical health, and mental health simultaneously (Figure 1, $B \rightarrow C$); and last, each labor force outcome was regressed on child abuse in 3-step multiple regression models (Figure 1, $A \rightarrow C$). Model 1 includes demographic (age, sex, marital status,

interaction of sex and marital status, and full-time student status) and childhood variables (parental history of being treated for nerves, family SES, childhood psychiatrist disorders, functional limitation, interpersonal relationship problems, and repetition of grade in school); Model 2 adds three dummy variables for child abuse: severe PA, non-severe PA, and SA; and finally, Model 3 adds three mediators (education, physical and mental health) to show any change in effects of child abuse on the outcome. Partial mediation was established if the abuse effect in Model 2 was reduced when mediators were entered in the Model 3.

Table 4's first three columns show the results of three multiple regressions assessing the associations between child abuse and each hypothesized mediator controlling for childhood and demographic variables (Figure 1: $A \rightarrow B$). Results showed that PA, regardless of its severity, was associated with poor mental and physical health; SA was associated with poor mental health only. Only severe PA was associated with reduced years of education.

The last two columns in Table 4 show the associations between three mediators and each work outcome controlling for childhood and demographic variables (Figure 1: $B \rightarrow C$). The positive values on three mediators were associated with the likelihood of employment. Only increased years of education was positively associated with increased income; better functioning in mental and physical health were not.

Table 4

Table 5 shows the results of a multi-level regression analysis for the personal income of participants who reported being employed in the past 12 months (Figure 1: $A \rightarrow C$). Childhood SES and parental history of being treated for nerves were significantly associated with reduced personal income (Model 1). When the three child abuse variables were entered to this model (Model 2), only severe PA was significantly associated with reduced income, with childhood SES no longer significant. In Model 3, when mediators were entered, the effect of severe PA was slightly reduced but remained significant. Years of education were significantly associated with higher personal income in the final model, with all measured childhood variables non-significant.

Sex difference in the associations between child abuse and outcomes was examined with an interaction term between sex and each abuse variable in the multiple logistic regression models. For the analysis for personal income, no sex difference was found.

Table 6 presents the results of the multi-level logistic regression for employment (Figure 1: $A \rightarrow C$). In the Model 1, lower childhood SES and repeated grade were associated with lower employment in young adulthood. When the three child abuse variables were added to the model (Model 2), none of abuse variables were significantly associated with employment; therefore a condition indicating mediator effects was not established. Model 3 shows that added three mediator variables had significant positive associations with

employment. Childhood SES and repeated grade were no longer associated with this outcome in the final model.

The analysis of sex difference showed a significant interaction of sex and severe PA on employment. The likelihood of females with severe PA of having employment was significantly higher than males with severe PA (OR = 2.5, CI = 1.2 to 5.1, p = .007) in Model 2. This sex difference remained in Model 3 (OR = 2.5, CI = 1.2 to 5.3, p = .008). A trend of females with SA having lower likelihood of employment, compared with males with SA, was found in Model 2 and Model 3 (OR = 0.5, CI = 0.2 to 1.2, p = .06). No sex effect with regard to non-severe PA was found.

Table 5 & Table 6

Discussion

Our study extended investigations of the link between childhood maltreatment and labor force outcomes. Existing studies that are available have substantial methodological limitations (e.g., selected samples, a single type of abuse, lack of control for childhood contextual factors). We analyzed a prospective community-based data to examine the association of childhood PA and SA with labor force outcomes in young adults, and the potential mediating role of documented impairment associated with exposure to child maltreatment – poor educational attainment, mental health, and physical health - in these associations. Accounting for the effects of demographic variables and childhood

health and family-related factors measured prospectively, our results showed an association of severe PA with reduced personal income among employed males and females. We did not find the association between child abuse overall and employment in the OCHS sample; however, there was a statistically significant interaction between exposure to severe PA, employment and sex. Educational attainment and current health status did not substantially mediate these associations. Compared to non-severe PA, severe PA was more likely to be associated with poorer childhood factors, mediator, and labor force outcomes, suggesting the gradient effects of severity of abuse.

The most notable finding in our study is the strong association between severe PA and reduced income for both males and females who were employed in the past year. Both severe PA and SA had a bivariate association with personal income; however, the final model of the multi-level regression analysis, adjusting for childhood and demographic variables, showed a significant association of only severe PA with income. The mediator variables slightly reduced this association. The results showed a 27.8% of reduction of personal income among those with severe PA compared with those without exposure to PA and SA. A diminished income associated with severe PA remained as a 25.6% reduction after adjusting for mediator variables. These results indicate that the negative effect of severe PA on personal income was not operating through a reduction in educational attainment.

Although previous studies reported an association between SA and reduced earnings among females (Robst & Smith, 2008; Hyman, 2000), our study found an association between severe PA and personal income for both males and females, controlling for the effect of SA. We speculate that adverse effects of SA on females' earning as previously reported are partially due to the effect of unmeasured maltreatment types such as PA.

We found a gradient effect for PA severity determined by the type and frequency of abusive acts. This reflects a result of a previous study with a differential effect of abuse on personal income. Robst and Smith (2008) reported a 20% of reduction of personal income among females with SA who reported adverse effects of abuse, but not those without such perception, compared with those without SA. These suggest that there may be an increased impairment in work-related functioning that is associated with reported magnitude of maltreatment, rather than a specific abuse type.

In terms of the effect of child abuse on employment, available findings are conflicting. A study of U.S. females did not find a difference between SA and no SA group in employment rate (Robst & Smith, 2008); a study of a U.S. representative sample reported the association of PA or multiple types of maltreatment (two or more of PA, SA, or severe neglect) and unemployment (Zielinski, 2009). We did not find a significant association of PA or SA with employment after controlling for childhood and demographic factors. In the OCHS sample, however, there was an interaction of sex and abuse type: a

significant effect of severe PA on lower likelihood of employment in males and trend of an SA effect on lower employment in females. Methodological differences, such as a measurement of child maltreatment, sample characteristics, and control variables may account for the inconsistent findings. The interaction effect of sex and type of abuse found in the OCHS sample may be a reflection of disproportional prevalence of abuse by sex. In OCHS sample, more males reported PA and more females reported SA, although there was no sex difference in prevalence of severe PA. In a study of U.S. representative sample (Zielinski, 2009), females had a higher prevalence than males of all categories of maltreatment examined (i.e., PA, SA, severe neglect, multiple types, and any maltreatment); no sex difference was examined in this study. Given the absence of standard measure of child maltreatment and other methodological variations including measurements of control variables, the association between child maltreatment and employment is still unclear. More studies using representative samples and validated measure of child maltreatment, accounting for influencing contextual factors, are needed to further the investigation, including possible sexspecific pathways from maltreatment to employment.

Only a few studies have tested the role of mediating factors on the association between child maltreatment and labor force outcomes. One study (Lee & Tolman, 2006) of females who were receiving welfare assistance found the mediating effect of mental and physical health on the association between SA and reduced time of work; however, childhood factors were not accounted for in

these associations. Our analysis, adjusting for childhood variables, did not show substantial mediating effects for education, or current mental and physical health on the association of child abuse and employment and personal income. The adjustment of childhood and demographic variables that were associated with both child abuse and mediator variables in our analyses might have reduced the mediating effects. For example, after controlling for childhood and demographic variables and other child abuse categories, severe PA was significantly associated with all three mediators, whereas SA was associated with reduced mental health only. However, three mediators were significantly positively associated with employment; and education was significantly positively associated with personal income in the multiple regression analyses adjusting for childhood and demographic variables. The results of our multiple regression analyses to test the mediator effects showed the independent effects of severe PA on personal income and males' employment, not operating through educational attainment, or current health status. The trend of sexually abused OCHS females having lower likelihood of employment was also independent of mediator effects. Further research should explore other possible mechanisms by which childhood exposure to maltreatment leads to diminished functioning in the labor force.

The results of our study have theoretical and research implications in family violence. The literature has identified labor force participation as one of the key factors in healthy family functioning. The adverse effect of insecure employment on health and mortality has been documented (Mathers & Schofield,

1998; Virtanen, Kivimaki, Joensuu et al., 2005). These adverse effects also relate to other family characteristics, such as an increased risk of separation and divorce, intimate partner violence (IPV), unwanted pregnancy, increased perinatal and infant mortality (Mathers & Schofield, 1998) – many of which are associated with occurrence of child maltreatment. A meta-analysis of risk factors of child neglect identified unemployment as a risk factor (Stith et al., 2009). Some studies identified male perpetrator's work less than part-time or career-related stress as a risk indicator of IPV (Stith et al., 2004; Wathen et al., 2007). Future research should consider the potential role of work-related functioning in the transition to young adulthood. This includes the impact of work-related functioning on the quality of life of maltreated individuals and their families.

There are several limitations to this study. Since childhood and family background variables were obtained prospectively when participants were between four and 16 years of age, it is possible that some changes occurred after data collection in 1983 but while children were under age 16. Possible misclassification is likely to underestimate the childhood effects. Retrospective measurement of childhood abuse may be subject to recall bias. Several investigations on the extent of the bias associated with retrospective report of child maltreatment have found that this type of measure tends to underestimate the prevalence of abuse (Fergusson, Horwood, & Woodward, 2000; Hardt & Rutter, 2004). Some speculate that the current mood state may influence the recall of childhood maltreatment; however, there is little evidence to support the

claim (Maughan & Rutter, 1997; Robins et al., 1985; Brewin, Andrews, & Gotlib, 1993). For example, Robins et al (1985) found substantial agreement on the longterm recall of childhood home environment between psychiatric patients and their non-psychiatric siblings. Assessment of childhood abuse and young-adult variables at the same time (i.e., labor force outcomes, mediators) in our study limits the ability to consider the temporal relationship of these variables. For example, we were not able to examine the temporal relationships between current mental and physical health and labor force outcomes; there may be bi-directional relationships. Although child sexual and physical abuse were assessed by a reliable and valid measure, it was not possible to measure other maltreatment types, such as neglect or emotional abuse. Finally, there was 43% sample attrition (1893/3294) from 1983 to 2001. In other longitudinal studies of youth unemployment, 25-40% losses have been reported (Caspi et al., 1998). We have attempted to address this issue by applying attrition weights in analyses to recapture our original sample profile in 1983. If there is a systematic bias, it would lead to some underestimation of influence associated with childhood factors, and we believe this is unlikely to affect our findings.

In summary, this study of a community-based sample suggests effects of child maltreatment on diminished labor-force outcomes that have been previously considered, but with selective samples and limited methods. The results indicate that poor educational attainment and mental and physical health minimally explain the link between maltreatment and labor force outcomes, after accounting

for childhood health and family factors. Our study suggests the independent effect of severe form of child abuse on poor labor force functioning and possible sex effect on employment but not in personal income. Further studies are needed to enhance our understanding of the specific mechanisms by which exposure to maltreatment is associated with poor labor force outcomes before considering approaches to assist those exposed to such adversities. Programs aimed at prevention of maltreatment before it occurs should also include labor force outcomes in their long-term assessment of the effects of such programs.

3.1. Figures and Tables

Figure 1 Hypothesized mediating model

B: Mediator



Note. All analyses controlled for childhood variables (psychiatric disorder, functional limitation, interpersonal relationship problem, grade repetition in school, parent treated for "nerves", and family socioeconomic status) and demographics (age, sex, marital status, interaction of sex and marital status, full-time student status)



Figure 2 Proportion of sample with or without child abuse by sex

Note. More males reported physical abuse than females (p < .010), and more females reported sexual abuse than males (p < .001). There was no sex difference in severe physical abuse.

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		Physical abuse		Effec	t size ^a
Variables	No	Yes (non-severe)	Yes (severe)	non-severe	severe
	(n = 1, 330)	(n = 217)	(<i>n</i> = 346)		
Continuous variables, Mean (SD)				q	q
Annual income, log	10.16 (.89) _b	10.18 (1.35) _b	9.88 (1.86) _b	.02	31
Canadian dollars, <i>Median</i> (<i>SD</i>)	25,848 (2)	26,370 (4)	19,536 (6)		
Education in years	15.29 (2.71) _b	15.37 (2.71) _b	14.52 (2.58) _c	.03	28
SF 36 mental health	.68 (7.38) _b	12 (7.38) _b	-2.55 (9.65) _c	-11	44
SF 36 physical health	.28 (6.69) _b	78 (7.60) _b	57 (7.27) _b	16	13
Age	28.09 (3.69) _b	28.81 (3.70) _c	28.47 (3.75) _{b,c}	.20	.10
Family SES	.35 (3.71) _b	13 (3.63) _{b,c}	45 (3.96) _c	13	22
Binary variables, %				ф	φ
Employed	85.5 _b	90.8 _b	81.5 _c	.05	04
Female	53.2 _b	44.7 _b	47.4 _b	90.	05
Full-time student	9.9 _b	6.9 _b	7.8 _b	03	03
Married or common-law	54.4 _b	59.5 _b	59.3 _b	.04	.04
Parent treated for "nerves"	$20.8_{\rm b}$	23.0 _b	25.4 _b	.02	.05
Grade repetition in school	8.7 _b	8.3 _b	12.1 _b	004	.05
Child psychiatric disorder	7.8 _b	14.3 _c	16.5 _c	.08	.12
Child interpersonal problem	7.6 _b	11.5 _{b,c}	16.5 _c	.05	.12
Child functional limitation	$3.4_{\rm b}$	5.5b	6.1 _b	.04	90.

Table1 1 Multivariate analysis of variance (MANOVA) and effect size for physical abuse

Note. CAD = Canadian dollars. SD = standard deviation; SES = socioeconomic status. PA = physical abuse. d = Cohen's d, φ = Phi coefficient.

MANOVA showed overall group difference: Wilks Lambda = 0.935, F = 3.50, df = 28, p < .001. ^a Effect size was in comparison with "no PA" group.

b, cMeans and percentage sharing a common subscript are not statistically different at the specified .01 level.

PhD Thesis M. Tanaka, McMaster - Health Research Methodology

		Sexual abuse	
Variables	No (<i>n</i> = 1,616)	Yes $(n = 277)$	Effect size
Continuous variables (Mean, SD)			q
Annual income, log	10.17 (.88) _a	10.02 (.99) _a	17
Canadian dollars (<i>Median</i> , <i>SD</i>)	26,108 (2)	22,471 (3)	
Education in years	15.23 (2.68) _a	14.73 (2.79) _b	19
SF 36 mental health	.61 (7.18) _a	-3.58 (10.74) _b	58
SF 36 physical health	.22 (6.53) _a	-1.27 (8.75) _b	23
Age	28.14 (3.73) _a	28.83 (3.53) _b	.18
Family SES	.27 (3.73) _a	55 (3.89) _b	22
Binary variables (%)			Ð
Employed	86.1 _a	79.8 _b	.07
Male	52.6 _a	26.7 _b	18
Full-time student	9.3 _a	8.3 _a	.01
Married or common-law	55.3 _a	59.2 _a	03
Parent treated for nerves	20.8 _a	28.2 _b	06
Grade repetition in school	8.7 _a	12.6 _a	05
Child psychiatric disorder	9.5 _a	13.7 _a	05
Child interpersonal problem	8.9_{a}	14.1 _b	06
Child functional limitation	3.7 _a	6.5 _a	05

•

Table1 2 Multivariate analysis of variance (MANOVA) and effect size for sexual abuse

Note. CAD = Canadian dollars. SD = standard deviation; SES = socioeconomic status. SA = sexual abuse. d = Cohen's d, $\varphi = Phi$ coefficient. MANOVA showed overall group difference: Wilks Lambda = 0.935, F = 7.14, df = 14, p < .001.

_{a,b} Means and percentage sharing a common subscript are not statistically different at $\alpha = .01$.

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_	1																
01	1	:															
~	0.03	0.20°	,														
-+	0.06 ^b	0.03	0.07b	1													
	0.03	-0.11c	-0.07b	0.04	1												
(0	-0.03	-0.02	-0.01	-0.28°	0.15°	1											
~	0.03	0.03	0.03	0.34°	-0.04	-0.20	;										
~	0.05 ^a	0.04	-0.18°	0.00	0.09°	0.04	0.08°	1									
•	-0.03	-0.08b	-0.08c	-0.09	0.41c	0.10°	-0.06ª	0.04	:								
0	0.01	0.04	0.06 ^b	0.06 ^b	-0.09°	-0.02	0.03	0.01	-0.08°	1							
Ξ	-0.01	0.05ª	0.05 ^a	0.17°	-0.24	-0.05a	0.02	-0.11°	-0.15°	0.05 ^a	1						
12	0.03	0.05 ^a	0.05a	0.09°	-0.09°	-0.01	0.01	-0.02	-0.05ª	0.08°	0.12°	1					
3	0.02	0.110	0.06 ^b	0.13°	-0.13°	-0.05	0.02	-0.03	-0.06ª	0.06 ^b	0.08°	0.080	1				
4	0.05 ^a	0.10	0.05 ^a	0.080	-0.12°	-0.03	0.03	-0.07b	-0.06ª	0.09°	0.05 ^a	0.05 ^a	0.38°	1			
2	-0.03	-0.15°	-0.19°	0.04	0.07°	-0.03	0.08°	-0.10°	0.04	-0.10°	0.03	- 0.00	-0.05ª	-0.06°	,		
9	-0.06a	-0.06a	· -0.08°	-0.02	0.12°	0.01	-0.02	-0.06ª	0.02	-0.01	-0.04	-0.12°	-0.06 ^b	-0.05ª	-0.110	1	
1	0.06ª	-0.05a	-0.07b	0.06 ^b	0.09c	-0.25°	0.07 ^b	-0.08°	0.03	-0.03	-0.04	-0.03	-0.03	-0.01	0.10°	0.12°	1
8	-0.02	-0.05ª	-0.05a	0.34	0.14	-0.32°	0.15°	-0.23c	0.03	-0.03	0.03	-0.01	0.03	0.02	0.12°	0.070	0.30
Note.	Variable	es, I: No	n-severe	PA, 2:	Severe P	A, 3: SA	, 4: Age	s, 5: Edu	ication, (3. Intern	5: Full-ti ersonal i	me stude	ent, 7: M s 14· Ps	farried, 8 vchiatric	3: Male,	9: Fami	ly SES, SF-36	
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Table 3 Bivariate associations between measured variables

PhD Thesis M. Tanaka, McMaster - Health Research Methodology

10: Parent treated for nerves, 11: Grade repeated, 12: Functional limit, 13: Interpersonal problems, 14: Psychiatric problems, mental health, 16: SF-36 physical health, 17: Employment, 18 Personal income. PA = physical abuse. SA = sexual abuse. SES = socioeconomic status. ${}^{a}p < .05. {}^{b}p < .01. {}^{c}p < .001.$

PhD Thesis M. Tanaka, McMaster - Health Research Methodology

Table 4 Associations between abuse and hypothesized mediators (A) and associations between mediators and outcomes (B) controlled for demographic and childhood variables

	Years of education	(A) SF-36 MCS	SF-36 PCS	(B) Employment	Personal income
	B (95% CI)	B (95% CI)	B (95% CI)	OR (95% CI)	B (95% CI)
Fixed effects					
Intercept	11.25 (10.42, 12.08)*	32 (-3.33, 2.69)	.63 (-2.00, 3.27)		7.84 (7.21, 8.47)*
Adult demographic					
Age in years	.14 (.11, .17)*	.06 (05, .17)	.01 (09, .10)	.99 (.95, 1.03)	.05 (.03, .07)*
Female	.50 (.18, .83)*	-1.17 (-2.29,05)*	19 (-1.15, .78)	1.15 (.78, 1.69)	30 (51,10)*
Married	02 (35, .31)	1.41 (.44, 2.37)*	.48 (34, 1.30)	2.55 (1.61, 4.04)*	.24 (.07, .41)*
Married x Female	37 (79, .06)	37 (-1.78, 1.04)	-1.15 (-2.40, .11)	.28 (.16, .50)*	32 (59,05)*
Full-time student	1.28 (.93, 1.62)*	36 (-1.68, .96)	.03 (- 1.00, 1.06)	.14 (.09, .21)*	-1.04 (-1.43,65)*
Childhood variables					
Family SES	.27 (.23, .30)*	.06 (04, .16)	.01 (08, .10)	1.00 (.96, 1.05)	.004 (02, .02)
Parent treated for "nerves"	34 (61,06)*	-1.71 (-2.71,70)*	.06 (75, .87)	.94 (.68, 1.32)	19 (39, .02)
Repeated grade	-1.54 (-1.91, -1.17)*	1.20 (09, 2.49)	73 (-1.92, .46)	.66 (.42, 1.03)	18 (50, .13)
Functional limitation	72 (-1.27,17)*	.42 (-1.17, 2.01)	-3.74 (-5.94, -1.53)*	1.02 (.56, 1.88)	.10 (11, .31)
Interpersonal problem	69 (-1.10,28)*	42 (-1.93, 1.09)	89 (-2.31, .54)	.83 (.52, 1.32)	02 (35, .31)
Psychiatric disorder	41 (79,04)*	94 (-2.36, .49)	44 (-1.82, .93)	1.03 (.66, 1.62)	.03 (22, .28)
Child abuse					
Severe PA	30 (57,03)*	-2.65 (-3.69, -1.60)*	48 (-1.38,43)*		
Non-severe PA	.19 (18, .56)	75 (-1.80,31)*	95 (-2.05,16)*		
SA	20 (50, .10)	-3.04 (-4.32, -1.76)*	- 1.11 (-2.25, .04)		
Mediator					
Years of education				1.14 (1.07, 1.21)*	.07 (.04, .10)*
SF36 mental				1.03 (1.01, 1.05)*	.01 (.01, .01)
SF36 physical				1.04 (1.02, 1.06)*	.01 (01, .02)
Random effects					
Level 2 (family)	1.71 (.25)*	10.15 (2.76)*	3.97 (1.68)*	.38 (.27)	.16(.06)*
Level 1 (child)	3.71 (30)*	47.64 (3.38)*	42.26 (3.01)*		-(cz.) 24.1

Note. B = unstandardized beta. MCS = mental component summary scores. OR = odds ratio. PA = physical abuse. PCS = physical component summary scores. SA = sexual abuse. SES = socioeconomic status. $^{*}p < .05.$

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	Мос	del 1	Mod	el 2	Mo	Model 3	
	В	SE	В	SE	В	SE	
Fixed effects							
Intercept	8.629*	.265	8.687*	.264	8.866*	.315	
Adult demographic							
Age in years	.060*	.009	.006*	.009	.048*	.009	
Female	271*	.105	267*	.102	302*	.102	
Married	.230*	.086	.250*	.087	.261*	.088	
Married x Female	344*	.140	363*	.141	340*	.140	
Full-time student	931*	.198	923*	.193	340*	.197	
Childhood variables							
SES	.020*	.010	.017	.009	002	.010	
Parent treated for	213*	.106	209*	.106	185	.105	
"nerves"							
Repeated grade	289	.168	283	.165	179	.160	
Functional limitation	.034	.105	.040	.106	.105	.108	
Interpersonal problem	074	.167	041	.171	007	.173	
Psychiatric disorder	016	.129	.020	.127	.060	.125	
Child abuse ¹							
Severe PA			325*	.116	296*	.112	
Non-severe PA			084	.113	088	.110	
SA			.009	.111	.026	.112	
Mediator							
Years of education					.072*	.017	
SF36 mental health					.004	.004	
SF36 physical health					.005	.006	
Random effects							
Level 2 (family)	.184*	.071	.198*	.074	.172*	.066	
Level 1 (child)	1.429*	.256	1.403*	.250	1.396*	.243	
-2 x loglikelihood	48	05.5	47	93.4	476	64.3	

Table 5 Multilevel multiple regression of personal income (log) on child abuse among young adults who were employed in the previous year

PhD Thesis M. Tanaka, McMaster - Health Research Methodology

Note. OR = odds ratio. B = unstandardized beta SE = standard error. SES = socioeconomic status. PA = physical abuse. SA = sexual abuse. *n < 05

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*p < .05. ¹There was no statistically reliable interaction between abuse exposure, income and respondent sex. :

	Мо	del 1	Мо	del 2	М	odel 3
	OR	95% CI	OR	95% CI	OR	95% CI
Fixed effects						
Adult demographic						
Age in years	1.01	0.96, 1.05	1.01	0.96, 1.05	0.99	0.95, 1.03
Female	1.12	0.77, 1.63	1.20	0.81, 1.76	1.20	0.81, 1.78
Married	2.64*	1.67, 4.19	2.69*	1.70, 4.26	2.60*	1.64, 4.11
Married x female	0.27*	0.15, 0.47	0.26*	0.15, 0.46	0.28*	0.16, 0.49
Full-time students	0.17*	0.12, 0.26	0.17*	0.11, 0.25	0.14*	0.09, 0.21
Childhood variables						
SES	1.04*	1.00, 1.08	1.04*	1.00, 1.08	1.01	0.96, 1.05
Parent treated for	0.85	0.61, 1.18	0.87	0.62, 1.22	0.96	0.68, 1.33
"nerves"						
Repeated grade	0.54*	0.35, 0.85	0.57*	0.36, 0.89	0.68	0.44, 1.06
Functional limitation	0.81	0.44, 1.48	0.82	0.46, 1.46	1.02	0.56, 1.84
Interpersonal problem	0.73	0.45, 1.18	0.76	0.47, 1.23	0.84	0.53, 1.36
Psychiatric disorder	0.89	0.57, 1.42	0.90	0.56, 1.44	1.03	0.65, 1.63
Child abuse ¹						
Severe PA			0.74	0.51, 1.07	0.83	0.57, 1.21
Non-severe PA			1.59	0.96, 2.63	1.64	0.99, 2.70
SA			0.74	0.51, 1.08	0.87	0.60, 1.26
Mediator						
Years of education					1.13*	1.06, 1.20
SF 36 mental health					1.03*	1.01, 1.04
SF 36 physical heath					1.04*	1.02, 1.06
Random effects						
Variance (SE)	.375 (.2	63)	.364 (.2	61)	.361 (.2	70)

Table 6 Multilevel multiple logistic regressions of employment (binary) on child abuse

Note. OR = odds ratio. SE = standard error. SES = socioeconomic status. PA = physical abuse. SA = sexual abuse. *p < .05.

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¹The significant interaction effect of sex and abuse was found. Females with severe PA had increased likelihood of employment than males with severe PA in Model 2 (OR = 2.5; 95% CI = 1.2 to 5.1; p = .007) and in Model 3 (OR = 2.5; 95% CI = 1.2 to 5.3; p = .008). There was a trend of sexually abused females having lower likelihood of employment than sexually abused males in Model 2 and 3 (OR = 0.5; 95% CI = 0.2 to 1.2; p = .06).

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Chapter 4: Child abuse and adult emotional and behavioural outcomes: How do methods affect this association?

Abstract

Differences in methodologies and study rigor in child maltreatment research make synthesis of studies difficult. This aspect may be a limitation in studies informing mechanisms and interventions. Community-based studies, both prospective and cross-sectional, often use retrospective self-report of child maltreatment to examine its association with mental health problems in adulthood. Other childhood adversities often coexist with child maltreatment – many of which may also affect subsequent impairment; however, measurement of these variables varies by study design. The impact of these methodological variations, as well as the timing of child abuse measures, on the association between child abuse and adult impairment is unclear.

<u>Methods:</u> We analysed and compared one cross-sectional and two prospective community based studies which utilized self-report measures of child abuse to investigate possible differences in the association between child physical and sexual abuse and young adult health outcomes across studies and across timing of measurement of child maltreatment. Logistic regression was used to estimate the adjusted odds ratio (OR) and 95% confidence intervals (CI) for two psychiatric disorders: depressive disorder and substance dependence, and one "risk" behaviour: daily smoking. <u>Results:</u> Analysis produced both significant and non-significant adjusted OR for all three outcomes across studies without a consistent pattern of the association by study design or abuse type. There was no evidence of inflated adjusted odds for estimates based on concurrent measures of child maltreatment and outcomes compared to non-concurrent measures.

<u>Conclusion:</u> Three community-based studies with child maltreatment measured by retrospective self-report produced various estimates of the associations between child maltreatment and studied outcomes. Differences in the measures of child maltreatment and confounders may contribute to these findings. Concurrent measures of child maltreatment and outcomes do not appear to inflate estimates of associations.

Introduction

Although the association between exposure to child maltreatment and increased risks of psychiatric disorders has been well-established in the literature (Fergusson, Boden, & Horwood, 2008; Gilbert et al., 2009; Kessler, GillisLight, Magee, Kendler, & Eaves, 1997), the strength and nature of this association is still unclear. A number of studies have found a strong association between exposure to childhood neglect, physical and sexual abuse (CPA, CSA) and increased risk of depressive disorders, with adjusted estimates ranging from odds ratio (OR) of 1.3 to 2.4 (Gilbert et al., 2009). However, inconsistencies exist in study findings regarding the potential long-term effect of childhood adversities on adult psychopathology. Some studies suggested that childhood adversities were associated with the first onset of psychiatric disorders (e.g., mood, anxiety, addictive, acting out disorders) but not with persistency of disorders (recent disorder) (Kessler, et al, 1997; Kessler & Magee, 1993), while others found that some childhood adversities have persistent effects on adult psychiatric disorders (Clark, Caldwell, Power, & Stansfeld, 2010; Turner & Butler, 2003).

The nature of the association between child maltreatment and substance use problems is less clear. Numerous clinical studies have reported a significant association between CPA, CSA and substance use problems (drug and alcohol) in adolescence and adulthood (Simpson & Miller, 2002). A prospective study with a matched control found a significant association of child abuse and neglect with substance use problems in middle adulthood (around age 40); however the same

study did not find an association when subjects were around 29 years old (Widom, Marmorstein, & White, 2006; Wilson & Widom, 2009). Authors of this study speculated that the prevalence of substance use is high in young adulthood, and that might have masked the maltreatment effect. A large community-based survey found an association of substance use problems with other psychiatric disorders such as depression, and suggested that the onset of substance use problems was likely due to pre-existing comorbid psychiatric disorders (Kessler et al., 1997).

A limited number of studies have assessed the link between child maltreatment and smoking behavior in young adulthood, most of which used clinical or at-risk samples. A retrospective cohort study of adults in a health maintenance organization in the U.S. found a gradient relationship between the number of adverse childhood events including CPA, CSA and heavy smoking behavior (Anda et al., 1999). A prospective study of an economicallydisadvantaged minority sample found an association between official reports of child maltreatment and daily smoking behavior in young adulthood; this association was fully mediated by family support, academic performance and educational attainment, criminal behavior, substance use problems, and life satisfaction (Topitzes, Mersky, & Reynolds, 2010). Another prospective study of a community sample used retrospective self-report to measure CPA and CSA, and found a significant association between maltreatment and daily smoking behavior after controlling for demographic variables and depression (Roberts, Fuenmeler,

McClernon, & Beckham, 2008). While these researches indicate negative consequences associated with exposure to child maltreatment, heterogeneity of methodologies and rigor makes meta-analysis of these studies difficult (Blettner, Sauerbrei, Schlehofer, Scheuchenpflug, & Friedenreich, 1999).

Child maltreatment research has been guided by ecological theory (Bronfenbrenner, 1979) in which it is postulated that five environmental systems influence the occurrence and consequences of child maltreatment: individual, family relational, societal, cultural, and transitions over the life course. Empirical studies have shown that child maltreatment often occurs in the context of other adversities such as poverty, dysfunctional family relationships and a family history of psychiatric problems – all of which may be linked to poor mental health outcomes independently of maltreatment (Kaufman, 2008; Kessler et al., 1997). It has been suggested that studies of the long-term effect of child maltreatment need to account for confounders for accurate estimates (Kessler et al., 1997). Studies that use small clinical or high-risk samples or a cross-sectional design often are limited by a lack of control for confounders (Fergusson, et al., 2008).

Within community-based studies, there is still considerable variation in methods. There is no consensus on definitions and measurement of child maltreatment and its subcategories including physical abuse, sexual abuse, emotional abuse, and neglect (Cicchetti & Toth, 2005). Various measures have been used, many of which have not been validated. The prospective measurement of child maltreatment, such as observation of caregiver-child interaction or

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caregiver interview in a large community sample throughout the childhood has practical and ethical limitations. For example, the observation is not a valid measure for certain child maltreatment types, such as sexual abuse that may involve with perpetrators who are not observed caregivers. It may be difficult to obtain participation by caregivers or accurate information about abuse occurrence from caregivers when a caregiver is also the abuser. Securing confidential research data, while reporting disclosed cases of child maltreatment is challenging in prospective studies. Relying solely on the official child protection services (CPS) records severely underestimates the prevalence of child maltreatment, as only a fraction of maltreatment is detected or reported. As a result, prospective studies often administer a self-report measure of childhood maltreatment to respondents in adolescence or adulthood asking about earlier events that happened in childhood. Recall bias is the major limitation of retrospective self-report (Widom & Shepard, 1996; Widom & Morris, 1997); however, research on the extent of this problem suggested that measurement of maltreatment using retrospective self-report tends to underestimate the prevalence of child maltreatment, possibly as healthy people tend to underreport exposure to child maltreatment (Fergusson, Horwood, & Woodward, 2000; Hardt & Rutter, 2004). Therefore, community-based studies where child maltreatment is measured by retrospective self-report are comparable, regardless of study design, in terms of the informant and timeframe of exposure to maltreatment. However, little is known about the comparability across studies of other aspects of maltreatment

measurement, such as number of question items, wording of questions (e.g., behavioral-specific such as "I was beaten" vs. perception such as "I was physically abused"), and description of maltreatment.

It is unclear whether various methodologies used in measuring confounders and control variables in prospective and cross-sectional studies influence the estimates of maltreatment effects. Potential confounders, such as early contextual and family-related factors are assessed in a different manner in prospective and cross-sectional studies. Prospective studies measure these factors by parental or teachers' report at different developmental stages, whereas crosssectional studies typically measure these variables based on respondents' selfreports. A selection of these variables for inclusion in analyses varies by studies, often depending on the availability of such information. Because not all analyses adjust for the same set of confounders, it is difficult to assess whether different estimates are due to the presence or absence of particular confounders. As analysis of community-based child maltreatment research becomes more complex with confounders across ecological levels and across developmental stages, an increased chance of measurement error is likely. Few papers have examined the robustness of these associations across studies, or across time within a cohort study.

A key issue in considering the strength of association between child maltreatment and specific health outcome is the extent to which this association varies depending on differing methods. Methodological factors that may

influence the estimates of maltreatment effect on later impairment include shared variance and recall bias. Cross-sectional studies are likely to have increased shared variance between child maltreatment, outcome, and confounders, if they measure these variables concurrently, by the same informant, using the same administration mode (e.g., face-to-face, computer, paper-and-pencil) (Campbell & Fiske, 1959). The association between child maltreatment and adult outcomes estimated by a study with greater shared variance may inflate the estimates compared with a study where these variables are assessed at different time points or by different informants or methods. Recall bias in cross-sectional studies may occur when early childhood variables such as family socioeconomic status (SES), family function, or parents' health status are not accurately recalled due to forgetting, or simply by being outside the respondents' knowledge.

In this study, we analyzed data from three community-based studies and compared the estimation of the association between exposure to CPA and CSA and current major depressive disorder, substance dependence or substance use problem, and daily smoking. These studies vary by study design (i.e., prospective birth cohort, non-birth cohort prospective design, and cross-sectional designs) and approach in various aspects of measurement. We obtained the permission to access one data (CHDS) that was otherwise publically inaccessible. By accessing each data, we manipulated the measurement feature; for example we applied the same upper age limit to define exposure to child maltreatment or age range of other childhood variables. We attempted to maximize the comparability in study

condition as much as possible, while allowing uncontrollable methodological variation. We applied the same set of variables, developmental stage of study sample, and the statistical analyses to the three studies.

Our specific research questions were:

- (1) Are the adjusted associations between child abuse (CPA, CSA) and young adult outcomes comparable across studies despite their various methodologies in design, measures, control variables, timing of assessment, and informants?
- (2) Does the timing of measurement of child abuse, whether concurrent or non-concurrent with outcome assessment, influence the adjusted association within the same cohort?

Methods

Study sample

We analyzed the following three community-based studies. Details of each study are summarized in Table 1. The National Comorbidity Survey Replication (NCS-R) was carried out on a national sample aged 18 years to 99 in 2001-2003. Trained lay interviewers conducted household, computer-assisted face-to-face interviews. Part I of the survey consisted of a diagnostic assessment of all participants, and the Part II survey was an in-depth assessment administered to all Part I participants with a lifetime disorder plus a probability sub-sample of other participants. The current study included the NCS-R Part II sample aged

between 21 and 35 years (n = 1,712). A summary of the NCS-R can be found elsewhere (Kessler et al., 2004).

The Ontario Child Health Study (OCHS) is a longitudinal study of child health and psychiatric disorders that began collecting data when participants were aged 4 to 16 years in 1983 with follow-ups in 1987 and 2001 (Boyle, Offord, Hofmann, & Catlin, 1987; Offord, Boyle, Szatmari, & RaeGrant, 1987). A number of key variables (e.g., SES, child, parent, and family functioning) were associated with attrition. Boyle et al. (Boyle et al., 2006) created attrition weights using weighted complete-case analyses (Little, & Rubin, 2002). These weights successfully recaptured the original sample characteristics. Further details about the OCHS data have been reported elsewhere (Boyle et al., 1987; Offord et al., 1987). For this study, our sample consists of participants aged 12 to 16 years during the original OCHS in 1983 (cohort 1) and those aged 8 to 11 years in 1983, then became 12 to 16 years during follow-up in 1987 (cohort 2). The OCHS assessed adolescent emotional and behavioural disorders at ages 12 to 16 years using the same measures for both cohorts. There were 1,691/2,355 eligible participants for our study (944 from cohort 1 and 747 from cohort 2) who were age 25 to 35 in 2001.

The Christchurch Health and Development Study (CHDS) is a prospective study of an unselected birth cohort of 1,265 children born in the Christchurch (New Zealand) urban region over a 4-month period in 1977 (Fergusson, Horwood, Shannon, & Lawton, 1989). As of 2002, information from birth to age 25 was

collected. At the age of 18, 21, and 25 years, participants were interviewed with a structured questionnaire.

Measurements

Measures are summarized below; the Appendix gives detailed descriptions.

Child abuse. Child abuse, which we defined as physical and/or sexual abuse that happened before the age of 16 years, was measured by retrospective self-report in all three studies. The CHDS measured child abuse at two time points, 18 and 21 years, using the same set of questionnaires; the other two studies measured child abuse in young adulthood concurrently with outcome assessment. CPA and CSA were measured.

The NCS-R used two items to assess PA. The OCHS used a modified set of questions from the Childhood Experiences of Violence Questionnaire (CEVQ) to assess CPA (Walsh et al., 2008). The CHDS assessed CPA based on reports of the severity and the frequency of physical punishment by either parent prior to age 16 years (Fergusson et al., 2000).

To measure CSA, the NCS-R included two items: "rape" and "sexually assaulted". In the OCHS, a modified set of the CEVQ included one CSA item (Walsh, MacMillan, Trocmé, Jamieson, & Boyle, 2008). In the CHDS, assessment of CSA was coded on a 4-point scale on severity of CSA (Fergusson et al., 2000).

Adult emotional and behavioural outcomes. Major depressive disorder, substance dependence or problem, and smoking behavior were assessed. In all

studies, the 12-month prevalence of depression was based on structured interview that generates Diagnostic and Statistical Manual of Mental Disorders 4th edition (DSM-IV) psychiatric diagnoses (American Psychiatric Association, 1994; Kessler & Ustun, 2004; Kessler, Andrews, Mroczek, Ustun, & Wittchen, 1998). We combined substance dependence and/or alcohol dependence as a measure of substance dependence. The NCS-R and CHDS assessed the 12-month prevalence of substance dependence; the OCHS measured substance use problems based on a study-specific measure. Measures of smoking behavior varied across studies; however, all were based on daily smoking behavior. In the CHDS, these outcomes were measured twice: at age 18 and at 21.

Childhood adversity.

SES: Childhood SES included parental education, occupation, family income, and age of mother at her child's birth. For all studies, both mother's and father's education levels were assessed. In CHDS, family income and occupational classification were based on parental reports. Parental occupation was measured based on the revised socio-economic indices for New Zealand (Johnston, 1983). In the NCS-R, an indicator for low income during childhood was assessed by participants' retrospective report. In the OCHS, family SES, a composite measure derived from family income, parental years of education, and occupational prestige were based on parental reports. Mother's age at first childbirth, based on parental reports, was available only in the CHDS and OCHS.

PhD Thesis M. Tanaka, McMaster - Health Research Methodology

Parental psychopathology: In all three studies, parental history of having been treated for nerves, being arrested or engaging in criminal activities, and having problems with alcohol or substance use were measured by a binary indicator for each.

Family psychosocial adversities: This category included dysfunctional relationships in the family and changes in parental figures. In the NCS-R, these were based on participants' retrospective reports about their experiences during the first 10 years of life. In OCHS, family dysfunction was based on parental reports on the general functioning subscale of the McMaster Family Assessment Device (FAD) (Byles, Byrne, Boyle, & Offord, 1988). Parental change was assessed by retrospective self-reports about experiences of parental death or parental divorce. In CHDS, parental conflict score was based on the period from 0 to 10 years of participants' lives (Fergusson, Horwood, & Lynskey, 1992), and change in parental figures was based on the continuous number of changes of parental reports.

Childhood academic performance and relationships: In the CHDS, a child's overall academic performance was measured as a grade point average of 5-point scale over curriculum areas and over years (11-13 years of age). In the OCHS, a child was assessed whether or not he/she repeated a grade by parental report, and whether or not a child had interpersonal relationship problems based

on parental- and self-report at age 12 to 16 years. In the NCS-R childhood academic and relationship information was not available.

Adolescent mental health: This was grouped into two types of disorders: internalizing (e.g., anxiety, depression) and externalizing problems (e.g., hyperactivity, antisocial, conduct disorders) in all studies. We coded as 1 for presence, and as 0 for absence of disorders. For the NCS-R, we defined "adolescent" emotional and behavioural disorders as those with onset between age 4 and 16. Internalizing problems were defined based on the self-report of onset ages of major depressive disorders, anxiety disorders, and externalizing problems based on the onset ages of conduct disorders and attention deficit disorders. In the OCHS, we used psychiatric syndrome scales that were based on adolescent responses to the OCHS revised assessments (Boyle et al., 1987; Offord et al., 1987) that map into items used in the Youth Self-Report (YSR) (Achenbach, 1991). In the CHDS, lifetime history of DSM major depression, anxiety disorders, and conduct disorders were assessed at ages 15 and 16 years based on both selfand parent-report.

Analysis

Logistic regression was used to examine the unadjusted and adjusted associations between child abuse and emotional and behavior outcomes in young adults. CPA and CSA were entered as two independent variables in the regression to estimate their ORs and 95% confidence intervals (CI). The unadjusted model included sex and age (except for the CHDS) as control

variables. Age was not included in the CHDS analysis since all participants were 25 years old at assessment. The adjusted model entered all childhood adversity variables as covariates: family SES, parental psychopathology, family psychosocial adversities, childhood academic performance and relationships, and early mental health, where available.

To identify study variables associated with non-response, logistic regression was used to model non-response as a function of all study covariates. We summarized the pattern of missing response and evaluated the attrition in each study.

We evaluated possible multicollinearity by assessing bivariate associations among all explanatory variables. We also assessed the tolerance and variance inflation for explanatory variables using regression analysis for each study.

The first analysis (the cross-study analysis) examined the difference in OR and 95% CI for CPA and CSA across studies. In all studies, child abuse and emotional and behavioural outcomes were assessed concurrently; in the CHDS, child abuse and outcomes measured at age 21 were used for this analysis. To examine the statistically significant differences between studies in the adjusted estimates, we assessed the effect size (z-score) between any two studies for PA and SA on three outcomes. The following formula was used:

 $Z = (\log - odds_{PA study A} - \log - odds_{PA study B}) / SE$ $SE = \sqrt{Var_{study A} + Var_{study B}}$

The second analysis (cross-timing analysis) was conducted on the CHDS

to examine whether there was a difference in the association between child abuse and adult outcomes when child abuse and outcomes were assessed concurrently or non-concurrently (abuse measured at 18 years and outcome measured at age 21 years).

In the OCHS, multilevel logistic regression was used to account for shared family variance, as more than one third of the sample had a sibling in the study. Attrition and sampling weights were applied for these analyses. Sampling weights were applied for NCS-R analyses to ensure representation of the target population. Analyses were conducted using SAS software (SAS Institute Inc., Cary, NC), and MLwiN for multilevel analyses.

Results

Sample. Of the NCS-R Part II sample (n = 5,692), 1,712 were age 21 to 35 years. Of those, 13 participants had missing responses on the child abuse measures and were excluded from analyses. The final NCS-R sample was 1,699 (99% of the eligible sample). There were 391 participants with one or more missing values for parental variables (education, substance/alcohol problems, criminal activities, received governmental assistance). We replaced these missing values with imputed values using the Expectation-Maximization (E-M) algorithm (Schafer, 1997). There were 466 participants with one or more missing responses on general questions about parental history of mood problems, witnessing parental fights, and parental changes. These questions were followed by more specific

questions to determine the timing or severity of these events. Without detailed information, we were unable to impute these missing values; therefore we replaced them with 0 as absence of event.

Of 1,691 available participants in the OCHS in 2001, 347 (20.5%) were excluded from the study due to missing data in response to the child abuse measures, resulting in 1,344 participants (739 from cohort 1 and 605 from cohort 2) for the analysis. Those with missing child abuse data were more likely to have parental change in childhood (OR = 2.6, 95% CI = 1.1- 6.3). There were 246/1,691 participants with one or more missing values for individual variables; these missing values were replaced with imputed values using the E-M algorithm.

Of 1,265 participants in the CHDS, 315 (24.9%) had missing values for either child abuse measures or emotional and behavioural outcomes; these were excluded from analyses. The final sample consisted of 950 participants (75% of original sample). Excluded participants were more likely to be male (OR = 1.5, 95% CI = 1.1 - 2.2), had poor academic performance rated by teachers (OR = 1.3, 95% CI = 1.1 - 1.6), and parental change (OR = 3.4, 95% CI = 2.5 - 4.8). All other variables were unrelated to exclusion status. There were 145/950 participants with one or more missing values to individual questions. We replaced these missing values with imputed values using the E-M algorithm.

Sample characteristics are presented in Table 2. The prevalence of both CPA and CSA was highest in the OCHS, followed by the NCS-R, then by the CHDS. The prevalence of substance dependence was much higher in the CHDS

than the NCS-R. Prevalence of other variables varied across studies at random.

Table 3 shows the bivariate associations of CPA and CSA with each variable. Across three studies some common trends were observed: CSA was more strongly associated with female sex, exposure to CPA, and childhood internalizing problems than CPA. CPA was more strongly associated with substance dependence in adults, dysfunctional family relationship in childhood, and childhood externalizing problems than CSA. Both CPA and CSA were correlated with adult depression and parental change in childhood. There were clear trends in three studies that both childhood internalizing and externalizing problems were associated with adult depression (data not shown), with internalizing problems having a stronger association.

The bivariate associations of three adult outcomes (Tables not shown) -depression, substance use problems, and smoking -- with family SES variables were within similar ranges across studies; they ranged from r = .002 to r = .05 in the NCS-R; from r = .004 to r = .15 in the OCHS; and from r = .02 to r = .14 in the CHDS. The bivariate associations of three adult outcomes with parental pathology and family psychosocial adversities were also similar: they ranged from r = .01 to r = .13 in the NCS-R; from r = .01 to r = .14 in the OCHS; and from r= .02 to r = .17 in the CHDS. The bivariate associations of three adult outcomes with childhood academic and relationship problems, where available, were also comparable between the OCHS and CHDS (r = .02 to r = .12 and r = .01 and r = .14, respectively).

The notable difference in the bivariate associations between three studies was found in the association of three adult outcomes with adolescent mental health. The bivariate association between internalizing problem and three outcomes were from r = .08 (substance use problem) to r = .42 (depression) in the NCS-R ranged, and from r = .04 (substance use problem) to r = .17 (depression) in the CHDS. In the OCHS adolescent mental health was measured by continuous measures, therefore it was not directly comparable. The bivariate association of externalizing problems with three outcomes in the NCS-R ranged from r = .12(depression) to r = .16 (smoking), and from r = .06 (depression) to r = .23(smoking) in the CHDS. The bivariates association of adolescent internalizing and externalizing problems with other covariates were similar across studies.

There were some moderate bivariate associations: In the OCHS, SES and father's education (r = .62), in the CHDS, SES and income (r = .53), conflict and parental change (r = .55), in the NCS-R, mother and father's education (r = .48), and major depression and childhood internalizing disorders (r = .42) (no table). In the assessment for tolerance and variance inflation in the regression analysis, there was no sign of multicollinearity in all studies, therefore all variables were kept in the analysis (no table).

Cross-study analysis. Tables 4, 5, and 6 present the results of the crossstudy analyses for depression, substance dependence, and daily smoking with unadjusted and adjusted OR's and 95% CI.

For depression (Table 4), the unadjusted model showed that both CPA and

CSA and female sex were significantly associated with depression in all studies. In the adjusted model, both CSA and CPA were significantly associated with depression in the OCHS (OR = 1.9, 95% CI = 1.3-2.8 for CPA; OR = 1.9, 95% CI = 1.2-2.9 for CSA); only CSA was associated with depression in the CHDS (OR = 1.2, 95% CI = 0.7-2.0 for CPA; OR = 2.8, 95% CI = 1.6-4.9 for CSA); and neither abuse type was significantly associated with depression in the NCS-R (OR = 1.4, 95% CI = 0.9-2.1 for CPA; OR = 1.1, 95% CI = 0.7-1.9 for CSA). Comparison of adjusted ORs across studies showed that there was no statistically significant difference between any two studies for both CPA and CSA on depressive disorders (z-score range: 0.26-0.64 in CPA; 0.58 – 1.21 in CSA).

Table 5 presents the results of the cross-study analyses for substance dependence. In the unadjusted model, CSA was associated with substance dependence in the OCHS and the CHDS, while CPA was associated with this outcome in the NCS-R. After adjusting for confounders, only the NCS-R showed a significant effect of CPA on substance dependence (OR = 2.2, 95% CI = 1.2-4.1). There was no statistically significant difference in adjusted OR between any two studies for both PA and SA on substance dependence (z-score range: 0.09-1.13 in PA; 0.34 - 0.38 in SA).

Table 6 shows the results for daily smoking. In the unadjusted model, both CPA and CSA were significantly associated with daily smoking except for CPA in the OCHS. After adjusting for confounders, only CSA in the CHDS was associated with daily smoking (OR = 1.9, 95% CI = 1.1-3.3). Estimates of the

effect size showed there was no statistically significant difference between any two studies in adjusted OR for both PA and SA on daily smoking (z-score range: 0.37 to 0.90 in PA; 0.32 to 0.89 in SA).

Cross-timing analyses with CHDS cohort. Table 7 shows the results of cross-timing analysis for depression within the CHDS cohort. Comparing the adjusted associations of child abuse with depression assessed concurrently at age 21 with the non-concurrent assessment at age 18, the concurrent assessments showed no clear pattern of increased magnitude of association. However, there was a pattern of a stronger effect of CSA on depression regardless of timing.

Table 8 shows the results of cross-timing analysis for substance dependence. There was no pattern of increased OR in concurrent compared with non-concurrent assessment. Similar to results for cross-timing analysis of depression, there was a trend of a stronger association of CSA with substance dependence regardless of timing of assessment. The effect of CSA approached nonsignificance when adjusted for confounders.

Table 9 presents the results of cross-timing analysis for daily smoking. Again, there was no sign of increased estimates based on concurrent assessment of child abuse and daily smoking, compared with non-concurrent assessment. The significant effects of CSA on daily smoking after being adjusted for confounders, as seen in the cross-study analysis (Table 6), was observed regardless of the timing of the abuse measures.

Discussion

We estimated the association between child maltreatment and adult impairment using three community-based studies of varying designs typically found in the child maltreatment literature. The three large community-based data enabled us to compare estimates of the associations of CPA and CSA with emotional and behavioural outcomes in young adults, while controlling for the concepts and measurements of early adversities. In both cross-sectional and prospective studies, results showed that the adjustment of the childhood health and family-related variables reduced the magnitude of the associations of CPA and CSA with all outcomes. However, there were both statistically significant and non-significant adjusted ORs without any patterns of the association by study design, abuse types, or outcomes. These adjusted estimates across studies were not statistically different from each other. Methodologies such as different child maltreatment measures, approaches to measuring confounders, or errors in measurement of outcomes may have contributed to variance of these estimates.

The most notable difference across studies in terms of the approach to measure variables was regarding adolescent mental health. This measure varied across two prospective studies (OCHS and CHDS). The CHDS assessed adolescent's history of psychiatric disorders at two measurement occasions by two informants (participants at age 15 and 16, and their parents). In the OCHS, adolescents aged 12 to 16 years were the only informants at single measurement. The measure of adolescent mental health in the NCS-R was conceptually different

from the other two studies. In the NCS-R, self-report of age of onset of disorders during adolescent age between 4 and 16 years was available and used to indicate a presence of disorders. These differences in measurement for adolescent mental health may have reflected on bivariate associations of adolescent mental health with adult emotional and behavioural outcomes. The bivariate association between internalizing problem and adult depression was higher in the NCS-R (r = .42) compared with the CHDS (r = .17). The corresponding figures for smoking and substance use disorder were r = .11 in the NCS-R and r = .08 in the CHDS, and r = .08 in the NCS-R and r = .04 in the CHDS, respectively. In contrast, the bivariate associations between externalizing problem and adult depression was similar in the NCS-R (r = .12) and CHDS (r = .06), with corresponding figures for smoking and substance use disorder, r = .16 in the NCS-R and r = .23 in the CHDS, and r = .15 in the NCS-R and r = .17 in the CHDS, respectively. The notably high correlation for adolescent internalizing problem and adult depression in the NCS-R may be due to direct link between what were measured at two points; depression and anxiety in adolescent and depression in adult. The link between internalizing disorders in adolescent and other two outcomes, smoking and substance use disorders, may be more indirect (Kessler, et al, 1997). Also, in the NCS-R, there are shared methods in adolescent mental health and adult outcomes that may have contributed some of these associations; both measurements shared the same informant, timing of assessment (i.e., retrospective measure of age of onset is used to classify adolescent

psychopathology), measurement methods that are not the case for the other two studies.

While prospective measure of onset age of psychiatric disorders in population-based survey is ideal to estimate the lifetime risk of disorders among those with exposure to early adversities compared to those without exposure, this type of study has not been available to date (Kessler et al., 2007). For study of the mechanisms of the link between early trauma such as child maltreatment and adult impairment, the accurate estimates of risk to develop a wide range of psychiatric disorders are necessary. Most of community-based studies do not include multiple methods to measure one outcome (e.g., prospective and retrospective measures of adolescent mental health) due to concerns associated with respondents' burden and limited resources. Given this challenge, more methodological studies are needed to examine the validity of different measures of early mental health, including aspects such as developmental timing and intervals of measurement, informants, and instrument to predict subsequent course of impairment. The goal of these studies is to propose the most efficient (valid) measures of childhood mental health in research examining factors to minimize the impact of childhood trauma on subsequent health.

Our analysis of the effect of the timing of measuring child maltreatment found no evidence for the inflated adjusted OR based on concurrent assessment of child abuse and health outcomes compared to non-concurrent associations. Fergusson et al. (2000) reported that in the CHDS despite the low agreement

between self-report of child maltreatment between two measurement points at age 18 and 21 years (kappa = 0.45), the relative risk of adult depression for the period between 16 to 21 years associated with two child abuse measures were stable (Fergusson et al., 2000). Fergusson et al concluded there was a tendency to underreport child abuse when assessed retrospectively and suggested that multiple measurement of child maltreatment would produce a more accurate estimate (Fergusson et al., 2000). Our study showed that a study that relies on a single measure to determine the exposure and outcome lead to various ORs even within the same cohort, further supporting the importance of multiple measurements of key variables to obtain a better estimate.

Our study has some limitations. Sample loss is a key limitation in longitudinal studies. The CHDS lost about 25% of the original sample and the sample loss of the OCHS was 43%. While attrition weights were applied to the OCHS, attrition weights were not readily available for the CHDS. Results of our study have limited generalizability. It would have been ideal to apply the same instrument to measure child maltreatment across studies to isolate out the effect of different approach to measure childhood variables, prospective versus retrospective measure, other than child maltreatment. Without controlling for this aspect of child maltreatment measure (although informant and period of exposure are the same), it is impossible to know to what extent the finding was due to methodological difference in maltreatment measures or other variables. More studies that use the same validated retrospective self-report measures of

maltreatment will enhance methodological investigations. Although the NCS-R attempted to measure retrospective report of onset age of psychiatric disorders in such a way to minimize potential recall bias (Kessler et al., 2004), misclassification might have existed in our study (Simon & VonKorff, 1995). Our study assessed internal validity with only one study with multiple assessment of child maltreatment. Replication of the cross-timing analysis with other community samples would be useful to examine the stability of estimates of relationship of abuse and adult emotional and behavioural outcomes.

In summary, adjusted estimates of abuse effects on depressive disorders, substance dependence disorders, and daily smoking were not consistent across the three studies we investigated, even after controlling for the same concepts of childhood adversities as potential confounders. There was not recognized pattern of these associations. Also, there was no evidence in this study that concurrent assessment of exposure to child abuse and adult emotional and behavioural outcomes inflated the associations between these. There are many methodological challenges in child maltreatment research. Examination and improvement of the validity of measurements is important to advance this research.

4.1. Figures and Tables

Table 1 Analyzed studies

Name of	The National	The Ontario Child	The Christchurch
study,	Comorbidity Survey-	Health Study	Health and
location	Replication (NCS-R),	(OCHS),	Development Study
	U.S.A.	Canada	(CHDS),
			New Zealand
Study design	Cross-sectional	Prospective	Prospective
		longitudinal	unselected birth
			cohort born in the
			Christchurch urban
			region during a 4-
			1977
Years	2001-2003	1983-2001	1977-2002
Response	70.9%	57.0% from 1983 to	75%
	Part I (n = 9,282)	2001.	
	Part II ($n = 5,692$)		
		Baseline:	
		N = 3,294 children	
		Trom 1,869 families.	
		N = 2.355 with 1.803	
		N = 2,555 with 1,695	
		detailed questionnaire	
		including child	
		maltreatment.	
Sample for	n = 1.699, aged	N = 1,344 aged	N = 950
analysis	between 21 to 35	between 25 and 35	
	years of part II	years in 2001	
	sample.	n=739 (cohort 1) and	
		n=605 (cohort 2)	
		Cohort 1: aged 12 to	
		16 years in 1983	
		Cohort 2: aged 8 to	
		11 years in 1983,	
		then became 12 to 16	
		years in 1987	
Sampling	Sampling weights	Sampling weight	Not applied
weight		based on the first	
		wave, Attrition	
		weight in the third	
		wave	

Timing of	All mansuras wara	Prospective measures	Prospective measures
1 ming of	An measures were	Frospective measures	Flospective measures
assessment	based on	on childhood	on childhood
	retrospective self-	variables;	variables;
	report	retrospective self-	retrospective self-
		report on child	report on child
		maltreatment	maltreatment
Informants	Young adult	Parents (95%	Mothers, child
	participants	mothers) and	participants, teacher
		adolescents aged 12	
		to 16 years	
Summary of	The Nationally	The sampling unit	The CHDS has
study	representative mental	was all Ontario	followed the health,
	health survey on a	households listed in	education and life
	national sample aged	the 1981 Canada	progress of children
	18 years and older. A	Census, the sample	born over a 4-month
	replication of the	selection was by	period during mid-
	original NCS	stratified, clustered	1977
	conducted in 1991.	and random sampling	

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Table 2 Sample characteristics

	NCS-R ^a	OCHS ^a	CHDS
	n = 1,699, % (SE)	n = 1,344, % (SE)	n = 950, % (SE)
Demographic			
Age, $M(SD)$	27.7 (4.1)	30.1 (2.5)	25.0
Male	48.2 (1.7)	51.5 (1.6)	48.3 (1.6)
Child abuse			
CPA	16.6 (1.1)	32.4 (1.5)	11.2 (1.0) ^b
CSA	13.9 (1.0)	16.3 (1.2)	^d (0.0) ^b
Both CPA & CSA	4.2 (0.5)	8.8 (0.9)	1.7 (0.4) ^b
CPA measured at age 21			12.4 (1.1)
CSA measured at age 21			7.4 (0.8)
CPA measured at age 18 or 21			17.4 (1.2)
CSA measured at age 18 or 21			11.4 (1.0)
Adult emotional and behavioural outcomes			
Major depression	10.8 (0.7)	(1.1) (11.9)	14.0 (1.1) ^c
Major depression at age 21			18.3 (1.3)
Major depression at age 18			18.4(1.3)
Substance/alcohol dependence	2.9 (0.4)	4.9 (0.7)	7.1 (0.8) ^c
Substance dependence at age 21			8.3 (0.9)
Substance dependence at age 18			8.4 (0.9)
Daily smoking	24.1 (1.4)	24.9 (1.4)	22.4 (1.4) ^c
Daily smoking at age 21			24.2 (1.4)
Daily smoking at age 18			13.2 (1.1)
Family socioeconomic status (SES)			
SES		-0.043 (3.83), M (SD)	16.8 (1.2)
Income, M(SD)			5.21 (2.05)
Receive welfare	12.7 (1.1)		
Mother's education < high school	23.7 (1.6)	47.9 (1.6)	48.5 (1.6)
Father's education < high school	30.4 (1.6)	46.4 (1.6)	48.7 (1.6)
Maternal age first childbirth <=20		10.6 (1.0)	22.8 (1.4)
Parental pathology			

28.3 (1.5)	22.7 (1.4)	11.5 (1.0)		0.39 (0.75), M (SD)			33.4 (1.5)			2.49 (0.84), M (SD)) 33.7 (1.5)	7.6 (0.9)
27.1 (1.4)	20.0 (1.2)	4.4 (0.6)				21.1 (4.9)	16.8 (1.2)		14.8 (1.2)	14.8 (1.1)		11.8 (6.6), M (SD)	12.4 (6.1), M (SD)
9.7 (1.0)	21.1 (1.2)	3.2 (0.5)			12.8 (1.0)		24.0 (1.4)					10.1 (0.7)	16.3 (1.1)
Parent ever treated for nerves	Parent substance abuse	Parent criminal activity	Family psychosocial adversity	Parental conflict, M(SD)	Parental physical fight	Family dysfunction. M(SD)	Parents change (divorce/death/adopted)	Childhood academic and relationship	Social relationship problem	Academic performance	Adolescent mental health	Internalizing problems	Externalizing problems

PhD Thesis M. Tanaka, McMaster - Health Research Methodology

Note. NCS-R, The National Comorbidity Survey-Replication; OCHS, The Ontario Child Health Study; CHDS, The Christchurch Health and Development Study; CPA, child physical abuse; CSA, child sexual abuse; M, mean; SD, standard deviation; SE, standard error; SES, socioeconomic status

^a Weighted analysis

^b Childhood abuse measured at age 18

^c Adult outcomes measured at age 25

Italic: continuous scale

PhD Thesis M. Tanaka, McMaster - Health Research Methodology

CSA21^b -.18*** .52*** -.12*** 19*** 13*** 11** **60. *60. .08* .002 *40. 90 01 90. 90 CHDS CPA21^b .17*** -.13*** .14*** .39*** .11*** .14*** .19*** **60. **60. .07* .08* .07* *90. *80. 100. 64 CSA .02 -.18*** .004 .09*** .15*** .10*** ***11. ***L9. -.04 .08** *** 20' -.07* .05 04 05 OCHS^a .13*** .12*** .44*** .18*** CPA **80. **60 *90. .07* -.07* .001 .06* .02 03 .03 .23*** .15*** .19*** .52*** .11*** .12*** CSA .08** **40 .05* *90. .05* 100 NCS-R^a 6 01 ***60. .11*** .18*** .29*** ***60. .12*** ***60. .15*** 47*** .16*** CPA **/0 ** 40. .05* .05* 0. Maternal age first childbirth <= 20 Mother's education < high school Father's education < high school Family socioeconomic status (SES) Substance/alcohol dependence Both physical & sexual abuse Parent ever treated for nerves Adult emotional and behavioural (divorce/death/adopted) Parent substance abuse Parent criminal activity Family psychosocial factor Parental physical fight Family dysfunction Major depression Parental conflict Child characteristics Receive welfare Parents change Daily smoking Parental pathology Sexual abuse Demographic Child abuse Income Male outcomes SES Age

Table 3 Pearson correlation coefficient between child abuse and individual variables

Social relationship problem			.06*	**60.		
Academic performance			.03	.02	.05	.08*
Adolescent mental health						
Internalizing problems	.14***	.23***	.07*	.12***	.10**	.20***
Externalizing problems	.20***	.13***	.13***	.04	.16***	.12***

Note. * *P* < 05, ** *P* < 01, *** *P* < 001. NCS-R, The National Comorbidity Survey-Replication; OCHS, The Ontario Child Health Study; CHDS, The Christchurch Health and Development Study; CPA, child physical abuse; CSA, child sexual abuse; M, mean; SD, standard deviation; SE, standard error; SES, socioeconomic status

 $^{\rm a}$ Weighted analysis $^{\rm b}$ Childhood abuse and young adult outcome measures at age of 21 years

		Unadjusted	Adjusted
		OR (95% CI)	OR (95% CI)
NCS-R	CPA	1.9 (1.3-2.9)	1.4 (0.9-2.1)
	CSA	2.1 (1.5-3.1)	1.1 (0.7-1.9)
OCHS	CPA	2.2 (1.5-3.0)	1.9 (1.3-2.8)
	CSA	2.1 (1.4-3.1)	1.9 (1.2-2.9)
CHDS	CPA	1.6 (1.0-2.5)	1.2 (0.7-2.0)
	CSA	3.2 (1.9-5.4)	2.8 (1.6-4.9)

Table 4 Unadjusted and adjusted odds ratios of having major depressive disorder in young adulthood among those with child physical and sexual abuse

Note. NCS-R, The National Comorbidity Survey-Replication; OCHS, The Ontario Child Health Study; CHDS, The Christchurch Health and Development Study; CPA, child physical abuse; CSA, child sexual abuse

Figure 1 Unadjusted and adjusted odds ratios of having major depressive disorder in young adulthood among those with child physical and sexual abuse



Note. NCS-R, The National Comorbidity Survey-Replication; OCHS, The Ontario Child Health Study; CHDS, The Christchurch Health and Development Study; CPA, child physical abuse; CSA, child sexual abuse

		Unadjusted	Adjusted
		OR (95% CI)	OR (95% Cl)
NCS-R	CPA	2.9 (1.9-4.7)	2.2 (1.2-4.1)
	CSA	2.1 (0.8-5.4)	1.5 (0.6-3.9)
OCHS	CPA	1.5 (0.9-2.5)	1.3 (0.8-2.2)
	CSA	2.1 (1.1-4.2)	1.9 (0.9-3.8)
CHDS	CPA	1.7 (0.9-3.0)	1.4 (0.7-2.7)
	CSA	2.5 (1.2-5.4)	2.0 (0.9-4.5)

Table 5 Unadjusted and adjusted odds ratios of having substance dependence in young adulthood among those with child physical and sexual abuse

Note. NCS-R, The National Comorbidity Survey-Replication; OCHS, The Ontario Child Health Study; CHDS, The Christchurch Health and Development Study; CPA, child physical abuse; CSA, child sexual abuse

Figure 2 Unadjusted and adjusted odds ratios of having substance dependence in young adulthood among those with child physical and sexual abuse



Note. NCS-R, The National Comorbidity Survey-Replication; OCHS, The Ontario Child Health Study; CHDS, The Christchurch Health and Development Study; CPA, child physical abuse; CSA, child sexual abuse

	Unadjusted	Adjusted
	OR (95% CI)	OR (95% CI)
CPA	1.5 (1.1-1.9)	1.2 (0.9-1.5)
CSA	1.5 (1.0-2.1)	1.2 (0.8-1.7)
CPA	1.1 (0.8-1.4)	0.9 (0.7-1.2)
CSA	1.5 (1.1-2.0)	1.3 (0.9-1.8)
CPA	1.8 (1.2-2.7)	1.4 (0.9-2.2)
CSA	2.5 (1.5-4.2)	1.9 (1.1-3.3)
	CPA CSA CPA CSA CPA CSA	Unadjusted OR (95% CI) CPA 1.5 (1.1-1.9) CSA 1.5 (1.0-2.1) CPA 1.1 (0.8-1.4) CSA 1.5 (1.1-2.0) CPA 1.8 (1.2-2.7) CSA 2.5 (1.5-4.2)

Table 6 Unadjusted and adjusted odds ratios of having daily smoking in young adulthood among those with child physical and sexual abuse

Note. NCS-R, The National Comorbidity Survey-Replication; OCHS, The Ontario Child Health Study; CHDS, The Christchurch Health and Development Study; CPA, child physical abuse; CSA, child sexual abuse

Figure 3 Unadjusted and adjusted odds ratios of having daily smoking in young adulthood among those with child physical and sexual abuse



Note. NCS-R, The National Comorbidity Survey-Replication; OCHS, The Ontario Child Health Study; CHDS, The Christchurch Health and Development Study; CPA, child physical abuse; CSA, child sexual abuse

		Unadiusted	Adjusted
		OR (95% CI)	OR (95% CI)
Abuse measured at 18 years	CPA	2.1 (1.3-3.4)	1.7 (1.0-2.8)
	CSA	4.4 (2.7-7.3)	3.9 (2.3-6.6)
Abuse measured at 21 years	CPA	1.6 (1.0-2.5)	1.2 (0.7-2.0)
	CSA	3.2 (1.9-5.4)	2.8 (1.6-4.9)

Table 7 CHDS - Unadjusted and adjusted odds ratios of having major depressive disorders at age of 21 among those with child physical and sexual abuse measured at aged 18 and 21.

Note. CHDS, The Christchurch Health and Development Study; CPA, child physical abuse; CSA, child sexual abuse

Figure 4 CHDS - Unadjusted and adjusted odds ratios of having major depressive disorders at age of 21 among those with child physical and sexual abuse measured at aged 18 and 21.



Note. CHDS, The Christchurch Health and Development Study; CPA, child physical abuse; CSA, child sexual abuse; MD, major depressive disorder
Table 8 CHDS - Unadjusted and adjusted odds ratios of having substance
dependence at age of 21 among those with child physical and sexual abuse
measured at aged 18 and 21.

		Unadjusted	Adjusted
		OR (95% CI)	OR (95% CI)
Abuse measured at 18 years	CPA	1.7 (0.3-3.1)	1.2 (0.6-2.5)
	CSA	3.1 (1.5-6.5)	2.3 (1.0-5.0)
Abuse measured at 21 years	CPA	1.7 (0.9-3.0)	1.4 (0.7-2.7)
	CSA	2.5 (1.2-5.4)	2.0 (0.9-4.5)

Note. CHDS, The Christchurch Health and Development Study; CPA, child physical abuse; CSA, child sexual abuse

Figure 5 CHDS - Unadjusted and adjusted odds ratios of having substance dependence at age of 21 among those with child physical and sexual abuse measured at aged 18 and 21.



Note. CHDS, The Christchurch Health and Development Study; CPA, child physical abuse; CSA, child sexual abuse; SD, substance dependence

Table 9 CHDS - Unadjusted and adjusted odds ratios of having daily smoking at age of 21 among those with child physical and sexual abuse measured at aged 18 and 21.

		Unadjusted	Adjusted
		OR (95% CI)	OR (95% CI)
Abuse measured at 18 years	CPA	1.5 (1.0-2.4)	1.0 (0.6-1.6)
	CSA	2.7 (1.6-4.4)	2.0 (1.1-3.4)
Abuse measured at 21 years	CPA	1.8 (1.2-2.7)	1.4 (0.9-2.2)
	CSA	2.5 (1.5-4.2)	1.9 (1.1-3.3)

Note. CHDS, The Christchurch Health and Development Study; CPA, child physical abuse; CSA, child sexual abuse

Figure 6 CHDS - Unadjusted and adjusted odds ratios of having daily smoking at age of 21 among those with child physical and sexual abuse measured at aged 18 and 21.



Note. CHDS, The Christchurch Health and Development Study; CPA, child physical abuse; CSA, child sexual abuse

4.2. Appendix

Appendix A. Variables, informant & timing of measurement.

Variable	NCS-R*	OCHS*	CHDS*
Child physical abuse	Participant; age 21-35	Participant; third wave, age 25- 35	Participant; age 18, 21
	(1) "As a child, were you ever		(1) Physical punishment
	badly beaten up by your parents	"How many times before age 16	0 = parents never used physical
	or the people who raised you?"	did an adult	punishment, $1 =$ parents rarely
		(1) slap you on the face, head or	used physical punishment, $2 = at$
	(2) "When you were growing up,	ears or hit or spank you with	least one parent regularly used
	how often did someone in your	something like a belt, wooden	physical punishment, and
	household do any of the things	spoon or something hard?"	3 = at least one parent used
	(on list A) to you – often,	(2) "push, grab, shove or throw	physical punishment too often or
	sometimes, rarely, or never?"	something at you to hurt you?"	too severely, or treated the
		(3) "kick, bite, punch, choke,	participant in a harsh and abusive
	A list: "being pushed, grabbed,	burn you, or physically attack	manner
	or shoved, threw something,	you in some way?"	
	slapped or hit." Participants		Response of 2 or 3
	were asked, "Who did this to	Participants choose one of five	
	you?"	frequency categories with count	
		for each question: "never, 1-2	
	"Yes" to (1) before age 16, or	times, 3-5 times, 6-10 times, 10+	
	response of "often" or	times."	
	"sometimes" to (2) with an		
	indication of father/mother	(1) or (2) at least 3-5 times, or	
	figure as a perpetrator.	item (3) at least 1-2 times	
Child sexual abuse	Participant; age 21-35	Participant; third wave, age 25-	Participant; age 18, 21
		35	
	(1) Rape: "someone either having		(I) CSA
	sexual intercourse with you or	(1) "If anyone ever did any of the	0 = no CSA, I = non-contact

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	penetrating your body with a finger or object when you did not want them to, either by threatening you or using force, or when you were so young that you didn't know what was happening"	following things when you didn't want them to: touch the private parts of your body or make you touch their private parts, threaten or try to have sex with you or sexually force themselves on you".	CSA only, 2 = contact CSA not involving attempted or completed sexual penetration, and 3 = CSA involving attempted or completed sexual penetration (oral, anal or vaginal)
	(2) Sexual assault: "someone touched you inappropriately, or when you did not want them to"	Any response except "never"	A response of 3 of 4
	"Yes" response to either item that occurred before the age of 16 years		
Major Depressive Disorder	12 month prevalence Participant; age 21-35	12 month prevalence Participant; third wave, age 25- 35	12 month prevalence Participant; at age 18, 21, and 25
	World Mental Health Survey Initiative Version of the World Health Organization Composite International Diagnostic Interview (WMH-CIDI) Structured lay-administered	Composite International Diagnostic Interview-Short Form (CIDI-SF)	Composite International Diagnostic Interview (CIDI)
Substance Dependence	12 month prevalence Participant; age 21-35	Alcohol and drug use problems in the past 12 month Participant; third wave, age 25-	12 month prevalence Participant; at age 18, 21, and 25
	World Mental Health Survey Initiative Version of the World	35	Composite International Diagnostic Interview (CIDI)
	Health Organization Composite International Diagnostic	Alcohol use disorder identification test based on 10	1 = either alcohol or drug
	Interview (WMH-CIDI) Structured lav-administered	items. Examples are "How many drinks containing alcohol do vou	dependence present versus 0 = absence of both dependence

	interview	have on a typical day when you	
	1 = either alcohol or drug	during the last year have you	
	dependence present versus 0 =	found that you were not able to	
	absence of both dependence	stop drinking once you nad started?"	
		Higher score indicates more	
		likely to have an alcohol use	
		disorder, ranged 0-39, mean =	
		4.68, sd = 4.31. For scores 14 or	
		higher (95 percentile), coded 1,	
		otherwise coded 0	
		Drug use - number of times used	
		drugs (without prescription) used	
		in last 12months based on 13	
		items. Example is "How many	
		times, if any, have you used	
		marijuana or hash during the past	
		12 months?"	
		Scores ranged 0-9, mean $= 0.5$,	
		sd = 0.9 . For scores 3 or more	
		(95 percentile), coded 1,	
		otherwise 0	
		1 - either alcohol or drug use	
		nrohlem nrecent versus 0 –	
		absence of both problems	
Daily smoking	Daily smoking in the past 12	Currently daily smoker	Current smoking behavior and
	months	Participant; third wave, age 25-	dependence symptomatology in
	Participant; age 21-35	35	the past month
			Participant; at age 18, 21, and 25
	"About how many days out of the	1 = current daily smoker versus 0	
	last 365 did you smoke at least	= not a current daily smoker	1 = current daily smoker versus 0

	one cigarette, cigar, or pipe?"		= not a current dauly smoker
	1 = smoked 365 days versus 0 =		
	not a current or past smoker,		
	smoked but less than 305 days in the past 12 months		
Childhood SES	Participant; age 21-35	Parent; first wave	Parent; at respondent's birth
	(1) Mother's and father's	(1) Mother's and father's	(1) Mother's and father's
	education.	education.	education
	1 = less than high school	1 = less than high school	1 = less than high school
	graduate versus 0 = high school	graduate versus 0 = high school	graduate versus 0 = high school
	graduate	graduate.	Braunarc
	(2) Low income indicator	(2) Family SES	Parent; when participants aged
	"There was a period of six	A composite measure of: family income, parental vears of	10
	childhood and adolescence, when	education, and occupational	(2) Parental occupation
	the family received money from	prestige	Revised socio-economic indices
	government assistance program		for New Zealand. Based on the
	(e.g., welfare, Temporary	(3) Mother's age at first	highest occupational
	Assistance for Needy Families)"	childbirth	classification for either parent:
			(a) professional, managerial, (b)
	"Yes" response	Mother's age 20 years or younger	clerical, technical, skilled, (c) semi_skilled mskilled and
			sciiit-skiited, uiiskiited, aitu
			no forduran
			I= semi-skilled, unskilled or
			unemployed, $0 =$ other
			(3) Family income
			Average income rank of the
			family during the first 10-year

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			period of participants' life. Banger 1 to 10 lower numbers
			indicating lower average income
			(4) Mother's age at first
			childbirth
			Mother's age 20 years or younger
Parental	Participant; age 21-35	Parent; first and second wave	Parent; when participants aged
psychopathology)		15, for illicit drug use,
3	(1) Parental history of having	(1) Parental history of being	participants aged 11
	been treated for nerves	treated for nerves	
			(1)Parental history of depression,
	(2) parental history of being	(2) Parental history of criminal	anxiety or related problems
	arrested or engaging in criminal	activities	
	activities		(2) Parental history of criminal
		Participants; third wave	offending
	(3) Parental history of problems	About parents when they were	•
	with alcohol or substance use	before aged 16	(3) Parental history of alcohol
		(3) Parental history of substance	problems or dependence, or
	"Yes" response to each	or alcohol use problem	Parental history of illicit drug use
		"Yes" response to each	"Yes" response to each
Family	Participant; age 21-35	Parent; first and second wave	Parent; over the period from 0 to
psychosocial			10 years of participants' life
adversities	(1) Parental conflict	(1)Family dysfunction	
	"When you were a child, did you	General functioning subscale of	(1) Parental conflict
	ever witness serious physical	the McMaster Family	Range: -0.07 to 7.69, higher
	fights at home, like when your	Assessment Device. Six	scores implies greater inter-
	father beat up your mother?"	dimensions: problem solving,	parental conflict
		communication, roles, affective	
	"yes" response and first age of	responsiveness, affective	(2) Change of parental figures
	witness of 10 or younger	involvement and behavioral	Number of changes of parents
		control.	experienced by participants as a

	(2) change of narents		result of narental senaration.
	parental separation, divorce,	Participant; third wave, age 25-	divorce, reconciliation,
	death of either parent, adoption,	35	remarriage, placement in foster
	or foster care	(2)Parental change	care, and other changes of
		A parental death belore aged 10	custodial parents. Kange: 0 to
	"yes" response to any of parental	or parental divorce up to high	20.
	change at aged 10 or younger	school	
	- 44	"yes" response to either parental	
Childhood	NA	Parent; first and second wave	Teachers; at participants aged 11- 13 years
acaucillic		(1) Grade repetition	
relationshin		"Has ever repeated or failed a	(1) Child's academic
		grade?"	performance
)	A grade point average of 5-point
		1 = "yes" response by mother, 0	scale over curriculum areas and
		ou,, =	over years
			Curriculum areas: spelling,
		Parent and participants; first and	written expression, handwriting,
		second wave, age 12-16 years.	and math
			Range: 1 to 5, with lower scores
		(2) Interpersonal relationship	implying higher academic
		problem	performance.
		"During the past 6 months, how	
		well has gotten along with	
		others such as friends or	
		classmates; his/her teachers at	
		school; the family?"	
		Response option:	
		1: very well, no problems.	
		2: quite well, hardly any	
		problems.	

	Parent & participants; at ages 15 and 16 years (1) Internalizing problems DSM major depression ever, a number of DSM anxiety disorders. 1 = presence, if presence of depression or at least one anxiety disorders (i.e., Generalized Anxiety Disorder, Overanxious Disorders, and Social Phobia, Simple Phobia) (2) Externalizing problems	Conduct disorders ever
 3: pretty well, occasional problems. 4: not too well, frequent problems. 5: not well at all, constant problems. 1 = presence of problem, mother or youth responded with 4 or 5 to any of these, 0 = absence, all other responses. 	Participants; first or second wave, age 12-16 years. Psychiatric syndrome scales based on OCHS revised assessments that map into items used in the Youth Self-Report. (1) Internalizing problems a 26-item scale (2) Externalizing problems a 28-item scale	
	Participant; age 21-35 (1) Internalizing problems Self-report of onset ages of major depressive disorders, anxiety disorders (2) Externalizing problems Self-report of onset ages of conduct disorders and attention deficit disorders 1 = presence, if onset ages were between 4 to 16 years	
	Childhood mental health	

*Note. NCS-R: The National Comorbidity Survey-Replication; OCHS: The Ontario Child Health Study; CHDS: The Christchurch Health and Development Study.

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Chapter 5: General discussion

5.1. Major findings and implications

5.1.1. Study 1

Study 1 involved the preliminary evaluation of the CEVQ-SF in comparison with the previously validated original CEVQ (Walsh, MacMillan, Trocmé, Jamieson, & Boyle, 2008). The CEVQ-SF has been shown to be comparable to the CEVQ in estimating the lifetime prevalence of PA and SA, and has similar levels of two-week test-retest reliability, criterion validity in comparison with the CTQ, and the construct validity in comparison with traumatic symptoms.

The results should still be considered *preliminary*, given the methodological limitations, which included the following. The study used self-report questions from the same individual to measure key information such as child maltreatment and traumatic symptoms. Including ratings by clinicians or caseworkers in addition to self-report would improve the approach to measuring validity. Further validation of the psychometric properties of the CEVQ and CEVQ-SF across different samples would also be useful in examining the utility of these instruments beyond a child welfare sample.

Nevertheless, the findings of this study suggest that the CEVQ-SF is useful as a brief measure of exposure to child physical and sexual abuse and will be useful in both population-based studies as well as with clinical research samples. The most important finding of this study was the comparability of the

two versions of the CEVQ; reducing the number of items in the short form did not result in any deterioration in the psychometric properties of the instrument. The CEVQ-SF can be easily integrated within a broad range of surveys, and provides a measure of lifetime prevalence of child abuse. As with any public health issues, obtaining the local and national incidence and prevalence rates of child maltreatment is fundamental to identifying the scope of the problem. Such data are essential in determining approaches to prevention, early intervention, and treatment. Child maltreatment is recognized as a global public health problem (WHO/ISPCAN, 2006), and the United Nation's Convention on the Rights of the Child set the implementation of epidemiologic survey as part of its objectives (http://www2.ohchr.org/english/law/crc.htm#part2). As discussed earlier in this thesis, in Canada, the CIS systematically collects information about the incidence of reported child maltreatment across provinces. However, such data leads to major underestimates of the occurrence of maltreatment, especially among adolescents, since not every province or territory in Canada mandates reporting of maltreatment for youth older than 15 (Fact Sheet for Professionals – The Maltreatment of Adolescents in Canada, http://www.phac-aspc.gc.ca/cmvee/index-eng.php). This makes it more difficult to estimate exposure to maltreatment among youth between the ages of 16 and 19. A prospective population-based study would serve as a more active public health surveillance to estimate the scope of exposure to child maltreatment among adolescents and its associated contextual factors and impairment throughout the lifespan.

The CEVQ and the CEVQ-SF are potentially useful in clinical and child welfare settings. Discrepancies between reports by caseworkers and youth in determining child maltreatment have been noted frequently in the literature (Everson et al., 2008; McGee, Wolfe, & Wilson, 1997; Shaffer, Huston, & Egeland, 2008). Both prospective and cross-sectional studies have found that the youths' self-report of exposure to maltreatment was more strongly associated with adjustment problems than caseworkers' reports (Everson et al., 2008; McGee et al., 1997). It is possible that CPS-involved youth have adjustment problems associated with additional exposure to victimization beyond that identified by CPS workers. Despite these findings, many CPS rely exclusively on child maltreatment reports as assessed by caseworkers. Assessing children's perspectives on lifetime victimization may identify those who are vulnerable to later adjustment problems (McGee et al., 1997). This goes along with increasing consensus that all children in CPS need to have an assessment for emotional and behavioral problems, given the high prevalence of psychiatric symptoms (Burns et al., 2004; Levitt, 2009).

The advantage of the CEVQ-SF is its non-intrusive brief self-report approach. This may serve as a way to begin a discussion with children and youth in the CPS setting about their exposure to maltreatment. With the addition response of a (maltreatment is) "happening now", which only appears in the CEVQ, the short form could also be used as a monitoring tool to capture new maltreatment experiences and to identifying on-going service needs. Assessing

all forms of child maltreatment (i.e., PA, SA, emotional abuse, and neglect) more thoroughly as well as details of its occurrence among CPS-involved children may improve identification of children's needs at the time of the initial investigation. This may also lead to better identification of risk indicators for serious impairment and recurrence of maltreatment (Gilbert et al., 2009b; Hamby & Finkelhor, 2000). The use of a combination of instruments such as the CTQ and CEVQ or CEVQ-SF may serve for that purpose.

Questionnaires that directly ask children and youth about the most salient and clearly delineated types of maltreatment (PA, SA) in settings beyond CPS, such as in group homes, the juvenile justice system, or mental health programs, may improve the recognition of child victimization (Gilbert et al., 2009b; Hamby & Finkelhor, 2000). However, before use of brief self-report measures of maltreatment in such settings, it would be important to ensure that CPS is equipped to respond to increased reports of victimization. It would be essential to evaluate whether such identification leads to improved outcomes over the longterm for children involved with the child welfare system (Gilbert et al., 2009b; Levitt, 2009).

5.1.2. Study 2

Study 2 examined the possible link between child abuse and compromised labour force outcomes in young adults. This is one of the first studies to explore this question using data from a Canadian community-based sample. The results were consistent with data from the few available US studies that have suggested

negative effects of child abuse on economic productivity. Although in the OCHS, there was no significant association between child abuse and the likelihood of employment, controlling for demographic and childhood factors, the same analysis for personal income showed a significant association of severe PA with reduced income. This study tested the mediating effect of current mental and physical health and educational attainment on this association; however we found these factors did not substantially change the magnitude of the associations.

In this study, there was a sex difference in the association between child abuse and employment, but not for personal income. Males with severe PA were less likely to be employed compared with females with severe PA. Replication of this analysis with other samples will be important to confirm the finding.

As child maltreatment is a recognized risk factor for emotional and physical impairment (Gilbert et al., 2009a), it is likely that there are multiple pathways through which child abuse lead to the observed economic disadvantages. One possible mechanism may be through the link between child abuse and cognitive functioning. Perhaps youth with low cognitive functioning select employment that is cognitively less challenging or it may be the case that they have difficulty in maintaining employment where there are high demands on cognitive ability. It is hypothesized that increased job complexity requires skills such as negotiating interpersonal relationships, handling work-related technology, and keeping pace in a fast-changing work environment (Vaananen et al., 2003) Research has shown that severe physical abuse and/or neglect, but not sexual

abuse, was associated with lower IQ and school performance (Eckenrode, Laird, & Doris, 1993; KendallTackett & Eckenrode, 1996). Our study's finding that only exposure to severe PA reduced the personal income for both males and females is somewhat consistent with the results from this earlier research.

These results may have implications for youth involved with the child welfare system, as they are likely to be vulnerable during the transition from school to participation in the labour force during young adulthood. Empirical studies have consistently shown that child welfare-involved youth tend to have poorer outcomes in several domains compared with non-welfare involved youth; one in five will become homeless at some time after age 18; only 60% finish high school by age 19 (compared to 87% nationally); by age 25, less than 3% will earn a college degree (compared to 28% of all youth); and risks of incarceration, early pregnancy, and lack of employment are much higher than with other youth (Courtney, Piliavin, Grogan-Kaylor, & Nesmith, 2001; Tweddle, 2007).

5.1.3. Study 3

This study examined the methodologies of community-based studies of child maltreatment and adult health outcomes. The specific focus was the approach to measuring childhood variables including timing of asking about child abuse exposure; and evaluation of whether these methodological features affected the association between child abuse and adult health outcomes. Surprisingly, there was no significant difference in the adjusted associations across the three studies, even though these studies used different definitions, measures, informants,

and time frames to measure potential confounders. Although it would have been ideal to measure child maltreatment using the same questions across studies to examine the effects of confounders, no such opportunity existed; only outcomes were measured using similar methods (i.e., DSM-IV diagnosis).

The finding that variation in methods used to measure early contextual variables did not affect the association between child abuse and adult health outcomes across studies has important implications for child maltreatment research. The unadjusted estimates were reduced taking confounders into consideration (i.e., adjusted for childhood variables) in similar ways across studies. This implies that (1) childhood context variables must be always measured and controlled for in studying the effect of child abuse on impairment in adulthood; (2) variation in methods of measuring childhood contextual factors does not appear to be a major threat to validity, as suggested by some authors (Widom, Raphael, & DuMont, 2004). Controlling for these variables appears to be more important than such issues as the timing of measurement in estimating the effect of child abuse on adult health; (3) the relation between childhood contextual variables and adult health outcomes may be causal. In two prospective studies, controlling for childhood variables reduced the magnitude of the association between child abuse and adult health outcomes, implying early contextual factors are risk factors for impairment in adult health.

The second part of this study examined the effect of variation in the timing of asking about child maltreatment on the association between child abuse and

adult health outcomes within the cohort. There was no significant difference in the estimates between those analyses using concurrent and non-concurrent measures of child abuse and adult health outcomes. This analysis was repeated with data where the child abuse measure was administered at both ages 18 and 21, and three health outcomes: depression, smoking, substance use disorders measured at ages 18, 21, and 25 years (no tables); no significant differences were found. These results failed to support the argument often put forth that findings from cross-sectional data overestimate the association between child maltreatment and adult outcomes. This suggests that child abuse is a *risk factor* for depression, daily smoking, and substance use disorder. Overall, the results of this study supported those of the cross-sectional studies suggesting that the association of child maltreatment with adult health outcomes is likely to be independent of current mood. However, it also emphasizes the importance of collecting information about early contextual factors in cross-sectional studies.

Some authors argue that there are specific effects associated with the subtypes of child maltreatment. Fergusson (2008) reported stronger effects of SA than PA on a number of outcomes including anxiety disorders, conduct disorders, substance use, and suicidal ideation/attempts in the CHDS (Fergusson, Boden, & Horwood, 2008). However, in this study of comparison of three data, this aspect was inconclusive. In this study, while adjusted estimates from the CHDS were higher for SA than PA for all three outcomes, other two studies did not produce the same pattern. This inconsistency may have resulted from use of different

measures for child maltreatment exposure. Measurement of physical and sexual abuse varies across studies; for example, in the OCHS and NCS-R, SA was measured by one item and two items, respectively, whereas the CHDS used a 15item SA instrument followed by in-depth contextual measures. The sensitivity of an instrument may be increased by the number of items and use of wording that is behaviour specific (Hamby & Finkelhor, 2000; Streiner & Norman, 2003). Also child sexual abuse and physical abuse are two different phenomena; therefore it is difficult to interpret the reasons for the magnitude difference of the effect between abuse types. It is more useful to apply the same validated measure of child maltreatment across different samples (e.g., clinical, community, sex-based) to examine differences in relationship with impairment and understanding the potential mechanisms for such effects.

Some authors have expressed concern about the retrospective measurement of past mental health problems in epidemiological studies (Simon & VonKorff, 1995). In prospective studies, mental health symptoms were reported by youth (OCHS) or both youth and parent (CHDS). In the NCS-R, *onset age* of psychiatric symptom was reported by respondents using the CIDI. In secondary data analyses based on the NCS, the prevalence of past psychiatric disorders is often measured using the onset age of disorders, as was done in this study (Kessler & Magee, 1993; Kessler, GillisLight, Magee, Kendler, & Eaves, 1997). The bivariate association between adolescent depression and adult depression in the NCS-R was greater compared with the CHDS (it cannot directly compare with

the OCHS due to unit difference). This may reflect the increased shared variance of two measures in the NCS-R, as the same diagnostic criteria was used for measuring both onset age of psychiatric disorders and current prevalence. Of note, however, did not differ significantly across the three studies.

Overall, results of Study 3 showed that the association between child abuse and young adult health outcomes was similar across the three studies with varying designs and approaches to measurement of exposure. However, estimates still varied widely; this was thought to be due to the use of different measures of child maltreatment and other contextual variables. To conduct a more definitive study, it would be important to test for mediators and moderators, and compare the finding across studies, using the validated measures for key variables such as exposure to child maltreatment, as well as key mediator and moderator variables.

5.2. Direction for Future Work

5.2.1. Definition and measurement

Given the lack of a universal definition and standardized approaches to the measurement of child maltreatment, it is important that researchers continue working towards better strategies for measuring child maltreatment (Manly, 2005). Establishing a universal definition developed standard measure will enhance our ability to measure the extent of the problem across populations and over time. The field is especially in need of more focus on measurement of neglect and emotional abuse (Gilbert et al., 2009a).

Research to date has also examined the dimensions of child maltreatment and their predictive validity for negative child outcomes (Higgins, 2004; Lau et al., 2005). Dimensions under consideration include such factors as type of abuse, combination of different types of abuse, number of perpetrators, as well as frequency and duration of abuse. However, one of the ongoing methodological limitations is the lack of representativeness of the sample (e.g., selective, nonrandomized sample of CPS data) and a variety of approaches used to measure maltreatment.

5.2.2. Risk factors and intervention

Review of the literature indicated that the field needs greater knowledge about *risk factors* of child maltreatment that are modifiable and can be targeted in the development of interventions. For this purpose, the field needs more prospective longitudinal studies (MacMillan et al., 2007). For example, currently there is no good evidence as to risk factors of SA (Black, Heyman, & Slep, 2001). Prospective studies are useful to identify etiology within the ecological framework, and could use both CPS report and self-report of child maltreatment to measure child maltreatment. The CPS report is particularly useful to measure child abuse that occurred in very young ages. For self-report of child maltreatment within the context of research studies, anonymous surveys may be administered to children who are old enough to respond (i.e., around 10) (AmayaJackson, Socolar, Hunter, Runyan, & Colindres, 2000; Runyan et al., 2005)

In addition to prospective longitudinal studies, the field needs more intervention research. It is possible to test the extent to which modification of risk indicators reduces the risk of exposure to child maltreatment. Evaluation research is urgently needed, especially among the child welfare sector, given that numerous services have been provided in such settings without knowing the effectiveness of these services (Tanaka, Jamieson, Wathen, & MacMillan, 2010). This may be done before the temporal relation between a risk indicator and child maltreatment is clarified, although it is helpful to identify specific causal risk factors when developing interventions, rather than simply relying on risk indicators.

5.2.3. Gender and sex difference

Findings from Study 2 indicated a potential sex difference in the abuse effect on labour force outcomes in young adulthood. It is important to replicate this analysis using different samples and measurements of child maltreatment to confirm this finding. Future works that applies gender-based analysis will be also useful to increase our knowledge about the gender-specific mechanism in which child maltreatment leads to subsequent impairment. Many factors involved in child maltreatment research are potentially gender-sensitive such as exposure to different types of child maltreatment, self-report of victimization, traumatic stress symptoms (e.g., depression, anxiety, dissociation, sexual concerns, anger, posttraumatic stress), and victimization/perpetration in adolescent and adult interpersonal relationships. Despite the complexity of gender and sex differences

in child and adolescent physiological and psychological development, research methods that emphasize gender and sex-based analyses are currently underutilized. In the literature, existing studies apply different approaches to examine the effects of gender and/or sex. More methodological studies that focus on this aspect would be valuable.

5.2.4. Economic productivity in transition to young adulthood

Maltreated children and youth are especially vulnerable as they transition into young adulthood for several reasons: 1) maltreated children and youth are likely to suffer impairment in many domains of their lives including academic, cognitive functional, mental health, behavioural, and physical health (Gilbert et al., 2009a); 2) in their family relationships, there is a strong likelihood of poor attachments with parents or caregivers, as well as interpersonal difficulties; 3) there is the increased risk of re-experiencing violence across other contexts such as peer or dating relationships (Cicchetti & Toth, 2005; Duke, Pettingell, McMorris, & Borowsky, 2010)' 4) maltreated youth are more likely to engage in sexual behaviour at a younger age, become pregnant, and move into marriage-like relationships at younger ages compared with non-maltreated youth (Gilbert et al., 2009a); 5) foster families are often unable or unwilling to provide the support that most families provide to their children during transitions, such as funding for college, child care that permits work or schooling for young parents, or a place to live at a time of difficulty (Osgood, Foster, Flanagan, & Ruth, 2005a; Osgood, Foster, Flanagan, & Ruth, 2005b); and 6) youth are in a disadvantaged position in

developed countries with regard to the labour market; the unemployment rates of youth (ages between 15 to 24 years) are constantly higher (17.7%) than adults (7.0%) in 2009 across developed economies including Canada (Global employment trends: January 2010: <u>http://www.ilo.org/wcmsp5/groups/public/---</u> ed_emp/---emp_elm/---trends/documents/publication/wcms_120471.pdf).

Despite these challenges potentially faced by vulnerable youth in transition from adolescent to young adulthood, moving into a new role of economic productivity is often viewed as an opportunity for young adults in terms of socialization, learning, and development. Research has shown that work experiences have a role in helping young men and women appreciate the importance of socialization, and in gaining self-confidence, independence, and conscientiousness (Feehan, McGee, Williams, & Nada-Raja, 1995). Work satisfaction is associated with emotional stability (Roberts, Caspi, & Moffitt, 2003).

When young adults do not transition successfully to a new role of economic productivity and associated opportunities for human development, society experiences a loss of human capital. Research has shown that early unemployment (i.e., at least six month in a given year) has a negative effect on mental health including increased risk of suicidal ideation and attempts in young adults (Fergusson, Boden, & Horwood, 2007). A longitudinal study found that unemployment between the ages of 16 and 21 had a long-term effect on increased smoking and psychological distress persisting into adulthood (Hammarstrom &

Janlert, 2002). However, transition from school to unemployment has been relatively understudied in the field of child maltreatment.

Research on transition to young adulthood may be best discussed in a broader social and economic context, as barriers for vulnerable youth to navigate through this transition are embedded in the ecological framework. Future research could develop a model to foster resilience in youth during transition to young adulthood; perhaps multiple social services and educational settings can play a role. This would include addressing the mental health service needs of youth, fostering healthy intimate relationships and planning for a life course, providing at-risk youth personal support such as guidance, mentorship, and training. As youth who are involved in one social service are likely to be seen in other service settings such as social welfare, juvenile justice, and psychiatric and psychological services (Dworsky & Courtney, 2009; Osgood, Foster, Flanagan, & Ruth, 2005b; Ringeisen, Casanueva, Urato, & Stambaugh, 2009), it is essential that these social service sectors collaborate to support youth in their transition to adulthood. This type of collaboration needs to involve key stakeholders early on. For example, it is important to ensure that youth are provided equal opportunity to seek economically productive roles.

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Appendixes

Appendix A: Sample of Children's Aid Society of Toronto Data Analysis Confidential Agreement



STATEMENT OF CONFIDENTIALITY INVESTIGATORS, RESEARCH ASSISTANTS & TRANSCRIBERS

As an investigator, research assistant or transcriber you are being asked to respect people's right to confidentiality by not discussing or relaying in any manner publicly or privately, the contents of the raw data and/or interview data you are working with. The data and the participants are to be discussed only during research meetings with the Investigators.

In signing below, you are indicating that you understand the following:

- I understand the importance of providing anonymity and confidentiality to research participants
- I understand that by reviewing and/or transcribing and/or analyzing questionnaire/research data, that I may be able to identify individuals or organizations. I understand that this information is to be kept confidential.
- I understand that the contents of questionnaires/research data are not to be discussed outside of research meetings with the Investigators
- I understand that when I am reviewing and/or transcribing and/or analyzing questionnaire/research data, I will be the only one to see the data and I will store the data in a secure location at all times
- Wherever possible, "blind" procedures are in place to protect participant anonymity, including not revealing to the data collector the assignment of the participant to a particular agency or having knowledge of the specific research hypotheses. Protocols for maintaining individual anonymity are maintained at all times, inside and outside of the discrete data collection environment.
- I understand that the data files, in hard copy or electronic form, are to be secured at all times

- I understand that the data I will be examining is provided by youth participants from the Children's Aid Society of Toronto (CAST), the Catholic Children's Aid Society of Toronto (CCAS) and the Peel Children's Aid Society (Peel CAS), and that youth data from these three agencies is amalgamated/consolidated
- The data I am analyzing, which is provided by the Maltreatment and Adolescent Pathways (MAP) Project, is collected by trained, supervised research assistants who protect anonymity and confidentiality, as per approved institutional research ethics board procedures

Please note that the confidentiality in research herein is specific to the Maltreatment and Adolescent Pathways (MAP) Project database (Christine Wekerle, Principal Investigator, Faculty of Education, The University of Western Ontario; cwekerle@uwo.ca). This database will

be accessed in the year(s) <u>2008-2009</u> by <u>Masako Tanaka</u> at <u>McMaster University</u> who is supervised by <u>Harriet L. MacMillan, MD</u> at <u>Department of Psychiatry &</u> <u>Behavioural Neurosciences, McMaster University</u> and who is a MAP Co-Investigator.

CAST MAP Liaison:Deb GoodmanCCAS MAP Liaison:Bruce LesliePeel CAS MAP Liaison:Brenda Moody

By signing my name, I agree to the above statements and promise to ensure the confidentiality and anonymity of the participants in this study are maintained at all times.

SIGNATURE OF INVESTIGATOR, RESEARCH ASSISTANT, TRANSCRIBER

Signature	
(fill in your name, credentials, institutional affiliation, & contact information below)	

Date

Masako Tanaka, MPH Health Research Methodology (PhD program) Faculty of Health Science McMaster University Tel: 905.521.2100 x74357 Fax: 905.383.8068 Email: tanakam@mcmaster.ca

I have fully explained the issues of confidentiality and anonymity to the above individual and am responsible for directly supervising his/her work.

SIGNATURE OF SUPERVISING RESEARCHER/MAP CO-INVESTIGATOR (If Applicable)

Signaturo	
Signature	
(fill in your name, cr	edentials, institutional affiliation, & contact information below)

Date

Harriet L. MacMillan, MD, MSc, FRCPC Offord Centre for Child Studies Department of Psychiatry & Behavioural Neurosciences McMaster University, Patterson Building, Chedoke Hospital 1200 Main St. West, Hamilton, Ontario CANADA L8N 3Z5 Tel: 905.521.2100 x74287 Fax: 905.383.8068 Email: <u>macmilnh@mcmaster.ca</u>

Date of CAS Agency Approval:_____ Revised Date of Approval:

Appendix B: Restricted Data Use Agreement (for NCS-R)

INSTRUCTIONS: Please submit an original-signature copy of this agreement; this will be countersigned and a copy returned to you.

The Restricted Data Investigator and the Receiving Organization agree to the following terms and conditions:

Terms

- 1. "Restricted Data" refers to the original restricted data provided by ICPSR and any fields or variables derived from these data, on whatever media they shall exist. (Aggregated statistical summaries of data and analyses, such as tables and regression statistics, are not considered "derived" for the purposes of this agreement.)
- 2. "Restricted Data Investigator" refers to the investigator who serves as the primary point of contact for all communications involving this agreement. The Restricted Data Investigator assumes all responsibility for compliance with all terms of this agreement by employees of the receiving organization.
- 3. "Principal Investigator(s)" refers to the Restricted Data Investigator and any Co-Principal Investigators.
- 4. "Receiving Organization" refers to the organization employing the Restricted Data Investigator.
- 5. "Research Staff" refers to any individuals other than the "Restricted Data Investigator(s)" with access to the restricted data.
- 6. The "Representative of the Receiving Organization" refers to an individual who has the authority to represent your organization in agreements of this sort, such as a Vice President, Dean, Provost, Center Director, or similar official. (Note that a Department Chair is not acceptable unless specific written delegation of authority exists.)
- 7. "ICPSR" refers to the Inter-university Consortium for Political and Social Research.

Items Incorporated by Reference

- 8. The Application for Restricted Data, as approved by ICPSR, is incorporated by reference into this Agreement.
- 9. The Supplemental Agreement with Research Staff, as approved by ICPSR, is incorporated by reference into this Agreement.
- 10. The Data Protection Plan, developed by the Restricted Data Investigator, is incorporated by reference into this Agreement.

Ownership of Data

11. Ownership of restricted data will be retained by ICPSR. Permission to use restricted data by the Investigator(s) and Receiving Organization may be revoked by ICPSR at any time, at their discretion. The Investigator(s) and
Receiving Organization must return or destroy all originals and copies of the restricted data, on whatever media it may exist, within 5 days of written request to do so.

Access to the Restricted Data

- 12. Access to the restricted data will be limited solely to the individuals signing this agreement and the Supplemental Agreement With Research Staff, as detailed in the approved Data Protection Plan. The data may not be "loaned" or otherwise conveyed to anyone other than the signatories to this agreement.
- 13. Copies of the restricted data or any subsequent variables or data files derived from the restricted data will not be provided to any other individual or organization without the prior written consent of the ICPSR.

Uses of the Restricted Data

- 14. The restricted data will be used solely for the purpose of scientific and public policy research, and not for any administrative, proprietary, or law enforcement purposes.
- 15. The restricted data will be used to generate only statistical summary information that does not allow any individual, family, household, business, or organization to be identified.
- 16. The restricted data will be used solely for the research project described in the Application for Restricted Data incorporated by reference into this document.
- 17. No attempt will be made to identify any individual person, family, household, business, or organization. If an individual person, family, household, business, or organization is inadvertently identified, or if a technique for doing so is discovered, the identification or discovery will be immediately reported to ICPSR, and the identification or discovery will not be revealed to any other person who is not a signatory to this agreement.
- 18. No attempt will be made to link this restricted data with any other dataset, including other datasets provided by ICPSR, unless specifically identified in the approved Application for Restricted Data.
- 19. Use of the restricted data will be consistent with the receiving organization's policies regarding scientific integrity and human subjects research.

Data Confidentiality Procedures

20. If the Receiving Organization requires a review of research proposals using secondary survey data by an Institutional Review Board/Human Subjects Review Committee or equivalent body, that review has taken place and all approvals have been granted prior to application for use of the restricted data.

- 21. The Receiving Organization will treat allegations, by ICPSR or other parties, of violations of this agreement as allegations of violations of its policies and procedures on scientific integrity and misconduct. If the allegations are confirmed, the Receiving Organization will treat the violations as it would violations of the explicit terms of its policies on scientific integrity and misconduct.
- 22. The Restricted Data Investigator certifies that all aspects of the Data Protection Plan, as approved by ICPSR, will be followed until which time all copies of the restricted data are destroyed.

Destruction of Data Upon Completion of Research Project

23. The Restricted Data Investigator will certify to ICPSR that all originals and copies of the restricted data, on whatever media, will be destroyed at the completion of the research project described in the Application for Restricted Use Data or within 5 days of written request from the ICPSR.

Duration of This Agreement

24. This Agreement will go into effect upon approval of the Agreement by ICPSR, and will remain in effect until the completion of the research project, as noted in the Application for Restricted Use Data, or 24 months from the date this Agreement is accepted by ICPSR, whichever comes first. If, at the end of 24 months, access to the restricted data is still desired, the Restricted Data Investigator must contact ICPSR in writing requesting such continued access. If continued access is denied by ICPSR, or if the Restricted Data Investigator neglects to contact the ICPSR prior to the end of the 24-month period, all originals and copies of the restricted Data Investigator.

Post-Approval Modifications to Submitted Materials

- 25. If changes in research plans or computer environment will alter the information originally submitted as part of this Agreement, the Restricted Data Investigator shall provide the ICPSR with a copy of the revised materials and a memorandum describing the changes in advance of the revisions. These revisions will be considered amendments to this agreement and may not be implemented until written approval is received by ICPSR.
- 26. A change in the employer of the Restricted Data Investigator requires the execution of a new Restricted Data Use Agreement and preparation of a new Data Protection Plan. These materials must be approved by ICPSR before restricted data may be accessed at the new place of employment.
- 27. When other research staff join the project, they shall submit the Supplemental Agreement with Research Staff. Such supplemental agreements shall be submitted in a timely manner but, in any event, prior

to granting other research staff access to the data on whatever media in which the data may exist.

Violation of This Agreement

- 28. If ICPSR determines that the Agreement may have been violated, ICPSR will inform the Restricted Data Investigator(s) of the allegations in writing and will provide them with an opportunity to respond in writing within 10 days. ICPSR may also, at that time, require immediate return or destruction of all copies of the restricted data in possession of the investigators. Failure to do so will be determined to be a material breach of this agreement and, among other legal remedies, may be subject to injunctive relief by a court of competent jurisdiction. If ICPSR deems the allegations unfounded or incorrect, the data may be returned to the Restricted Data Investigator under the terms of the original agreement. If ICPSR deems the allegations in any part to be correct, ICPSR will determine and apply the appropriate sanction(s).
- 29. If ICPSR determines that any aspect of this agreement has been violated, ICPSR may invoke these sanctions as it deems appropriate:
 - Denial of all future access to restricted data files
 - Report of the violation to the researcher's institution's office responsible for scientific integrity and misconduct, with a request that the institution's sanctions for misconduct be imposed
 - Report of the violation to appropriate federal and private agencies or foundations that fund scientific and public policy research, with a recommendation that all current research funds be terminated, that future funding be denied to the investigator(s) and to all other persons involved in the violation, and that access to other restricted data be denied in the future
 - Such other remedies that may be available to ICPSR under law or equity, including injunctive relief

I certify that all materials submitted with this application for this restricted data are truthful.

Furthermore, I acknowledge that I am legally bound by covenants and terms of this agreement, and that violation will constitute unethical professional practice and may subject me to the sanctions listed above.

Restricted Data Investigator

Study Title: The association between child maltreatment and young adult work outcomes Signature:

Date: Typed Name: Harriet L. MacMillan, MD Title: Professor, Department of Psychiatry & Behavioural Neurosciences, Department of Pediatrics Institution: McMaster University; The Offord Center for Child Studies Building/Room Number: Patterson Building Room 211, Chedoke Hospital Street Address: 1200 Main St. West City/State/ZIP: Hamilton, Ontario, L8N 3Z5 CANADA Telephone: 1-905.521.2100 x74287 Fax: 1-905-383-8068 Email: macmilnh@mcmaster.ca

Representative of the Receiving Organization

By signing this agreement, this organization agrees that access to these confidential data will be restricted to authorized persons whose names appear on this agreement and the Supplemental Agreement with Research Staff, and that this organization is legally bound by the covenants and terms of this agreement.

Signature:

Date: Typed Name: Stephen M. Collins Title: Associate Dean; Research Institution: McMaster University Building/Room Number: Health Science Centre Room 1B7 Street Address: 1200 Main St. West City/State/ZIP: Hamilton, Ontario, L8N 3Z5 CANADA Telephone: 1-905-525-9140 x22184 Fax: 1-905-524-1346 Email: hsresadm@mcmaster.ca

Representative of the Inter-university Consortium for Political and Social Research Signature: Date: Typed Name: Title: (Signatory delegated by Chair of ICPSR Council) ICPSR P.O. Box 1248 Ann Arbor, MI 48106-1248 Fax: (734) 647-8200 e-mail:netmail@icpsr.umich.edu Appendix C: Application for ICPSR Restricted Data Files (for NCS-R)

INSTRUCTIONS: Please provide the following information. Additional information may be attached to this form. Please note that only one application per research project is required. However, separate Data Protection Plans and Data Use Agreements are required for each organization represented by the research team.

- 1. Study Title: The association between child maltreatment and young adult work outcomes
- 2. Study Number:
- 3. Applicant information: (Note: Unless otherwise instructed, the first Principal Investigator listed will serve as the primary contact person with ICPSR.)

Name of Principal Investigator: Harriet L. MacMillan, MD Title: Professor

Organization: McMaster University; The Offord Center for Child Studies Department (if applicable): Department of Psychiatry & Behavioural Neurosciences, Department of Pediatrics

Street Address: Patterson Building, Chedoke Hospital, Room 211, 1200 Main St. West

City, State, ZIP: Hamilton, Ontario, L8N 3Z5 CANADA Phone: 1-905.521.2100 x7428 Fax: 1-905-383-8068

Email: macmilnh@mcmaster.ca

- 4. Title of research project for which this restricted data file is requested. The association between child maltreatment and young adult work outcomes
- 5. Short description of research project including research questions, primary methodology, categories of variables to be used (attach additional sheets if required).

We will examine the association between childhood adversities including maltreatment (physical or sexual abuse, witnessing domestic violence) and young adult work outcomes (employment). This study will control for childhood factors (childhood health and family background), adult demographics (sex, age, race, education, marital status). We will conduct a regression analysis to examine the possible mediating effects of psychiatric disorders, personality disorders, and interpersonal functioning.

- 6. What types of data from other sources will be merged with this restricted data file?We are planning to merge the restricted files with publicly available NCS-R data.
- 7. State reasons why the public-use data file is not adequate for conduct of the research project.

We wish to investigate the exposure to specific traumatic events (e.g., physical or sexual abuse, witnessing domestic violence) and personal income as a part of work outcomes that are not available in the public-use NCS-R data.

- Describe all the ways that you intend to use the results of the research, including plans for public dissemination.
 A research staff, Masako Tanaka, intends to use the results of this research in her doctoral dissertation. We are also planning to publish the results in a peer-reviewed journal.
- 9. Provide names, titles, and affiliations of other members of the research team who will have access to the restricted data or to output derived from these data. If not all members have been selected, please list as "unassigned" and indicate the job titles. Include individuals who are employed by different organizations.

Other member of the research team:

Masako Tanaka, PhD candidate, Department of Clinical Epidemiology and Biostatistics, McMaster University

Ellen Jamieson, Research Associate, Department of Psychiatry & Behavioural Neurosciences, McMaster University

 If employed at an organization that has a current NIH Multiple Project Assurances (MPA) Certification Number or Federal Wide Assurances (FWA) Certification Number, please provide the number and expiration date.

FWA# 00004958

Appendix D: The Data Protection Plan (for NCS-R)

What should be covered by the plan: The Data Protection Plan applies to both the raw data file received from ICPSR as well as any copies made by the research team, and any new data derived solely or in part from the raw data file. The plan also should address how computer output derived from the data will be kept secure. This applies to all computer output, not only direct data listings of the file.

1. Make reference to Title of Research Project and Principal Investigators.

This data protection plan is prepared for the research study titled: "The association between child maltreatment and young adult work outcomes." The principal investigator is Harriet L. MacMillan, MD.

- 2. List and describe all locations where copies of the data will be kept.
 - The raw data file received from ICPSR will be kept in a locked cabinet in a locked room at the Offord Centre for Child Studies when not in use. No backup of the raw data will be made. The Offord Centre for Child Studies has an alarm system in place for security, as there are multiple datasets stored at this research facility.
 - A new data file that will be made by research staff by merging the file received from ICPSR and publicly accessible NCS-R data will be kept secure in the hard disk on the only designated study computer (under the file name "data") with password protection in a locked room.
 - All the computer output derived from the data will be kept secure with password protection and stored on the hard disk of the study computer (under the file name "output").
- 3. Describe the computing environment in which the data will be used:
 - o Computing platform is the PC.
 - There is only one study computer (desktop) on which all data will be stored or analyzed. This computer is not connected to any network.
 - o No personal computer will be used for this research project.
 - The study computer is physically located in room that is always locked when the computer is not in use by research staff.
- 4. List and describe how data will be stored:
 - The data and electronic form of computer output will be stored on the study computer's hard drive. Electronic forms of output are password protected.
 - Back-up of data into removable diskettes will not be made.
- 5. Describe methods of data storage when data are not being used.
 - When data are not being used, the data are kept secure on the hard drive of the study computer with password protection.

- 6. Describe methods of transmitting the data between research team members (if applicable).
 - Because there is only one designated study computer, there will not be transmission of the data. The data will not be stored in any network, including LANs, Internet.
 - The data or analysis output derived from the data will not be transmitted via e-mail, e-mail attachments, or any Intranet system or a local area network.
- 7. Describe methods of storage of computer output (in electronic form as well as on paper).
 - The electronic form of computer output will be kept on the hard drive of the study computer. All files containing data will be protected with passwords.
 - The paper form of computer output will be filed in the study folder located in the drawer in the locked room when not in use. The paper form of the analysis output will not be taken out of the locked room.

Appendix E: Restricted Data Use Agreement with Research Staff (NCS-R)

Supplemental Agreement With Research Staff

INSTRUCTIONS: Please submit an original-signature copy of this agreement. (It will be countersigned and a copy returned to you.) Use additional copies of this page if necessary.

The undersigned staff, in consideration of their use of this restricted data certify the following:

- 1. That they have read the associated Restricted Data Use Agreement, and the Data Protection Plan incorporated by reference into this Agreement.
- 2. That they are "Research Staff" within the meaning of the Agreement (any research staff other than the Restricted Data Investigator).
- 3. That they will fully comply with the terms of the Agreement, including the Data Protection Plan incorporated by reference into it.
- 4. That they will not attempt to access this restricted data until approved to do so by the ICPSR.

Study Title: The association between child maltreatment and young adult work outcomes

Signature:

Date:

Typed Name: Masako Tanaka

Title/Formal Affiliation with Research Project: PhD candidate, McMaster University, under supervision of the Principal Investigator, Harriet L. MacMillan, MD.

The above Research Staff are hereby granted approval to access this restricted data:

Inter-university Consortium for Political and Social Research

Date

Appendix F: Request of data from the Christchurch Health & Development Study

Date: December 4, 2008

Request of data from the Christchurch Health & Development Study

In my proposed study, I would like to examine the effect of study designs on estimation of the association between childhood abuse and adult mental health outcomes. I wish to analyze the Christchurch Health & Development Study data that has multiple assessments of childhood abuse and prospective measures of childhood variables, to compare with other community-based studies (crosssectional and prospective study with less waves) to see if different approaches of the assessment will produce comparable results.

The specific variables and the (age of assessment) I wish to look at with CHDS are the following.

1. Childhood demographic variables (at the age of or nearest to 10 years old)

- Age
- Sex
- Race
- Family socio-economic status/ indicators
- Family income
- Mother's and father's education level (if available, in years)
- Mother's age at first child (or teen parent status)
- Growing up in urban/ rural

2. Childhood variables (at the age of or nearest to 10 years old)

- Childhood psychiatric disorders (Depression, Anxiety, Hyperactivity disorders, Conduct disorders, Obsessive-compulsive disorders).
- Failure or repeated grade (early academic performance indicator)
- If parent was treated for nerves or nervous conditions, or if hospitalized for these conditions (family history of psychiatric disorders).
- Family dysfunction scale (marital disharmony or difficulty, domestic violence, etc.)

3. Adult variables (at the latest time point available)

- Marital status
- Years of education
- Employment status
- Personal income (annually in dollars if available, not the household income)
- Student status (currently student or not)
- Major Depressive Disorders (if available an indicator of 12 month prevalence)
- Drug and alcohol abuse disorders

- Antisocial disorders
- Social phobias

4. Childhood abuse (at both ages of 18 and 21 years)

- Physical abuse
- Sexual abuse

Additional information I wish to have.

- Definition of variables
- Respondents of variables (parent, teacher, child, etc)

Masako Tanaka McMaster University Appendix G: Email from John Horwood with permission of access to the CHDS data

Date: December 9, 2008

Dear Masako

David Fergusson has asked me to reply to your request for child abuse data from the Christchurch Health and Development Study (CHDS). We would be happy to provide you with a data set along the lines indicated. However, the preparation of data sets such as this is not a high priority for our unit. In addition, we are about to enter the summer vacation season in New Zealand and our unit will be closed for approximately 4 weeks from Christmas. For these reasons I may not have time to put a data set together for you until some time in February.

The provision of data from the CHDS database is normally subject to a minimal set of conditions. These are listed below.

(1) The data supplied by the CHDS are to be used solely for the purposes outlined in your research proposal. They will remain confidential to you and your supervisor and will not be released to any third party without the express consent of the CHDS.

(2) The CHDS will be provided with copies of all publications resulting from the research that involve the use of CHDS data.

(3) The CHDS will be appropriately acknowledged in all outputs from the research that utilize CHDS data.

Before we provide you with data I would ask that both you and your supervisor acknowledge acceptance of these conditions by return e-mail. I will contact you again once I have prepared a data set. If you haven't heard from me by mid-February please feel free to remind me of your request.

With kind regards, John Horwood

L

Appendix H: Email from John Horwood with CHDS data

Date: March 12, 2009

Dear Masako

Please find attached:

1. A SAS data set (chdsabuse.sas7bdat) containing the variables requested from the CHDS database. (I have been waiting for a response to my previous e-mail regarding your preferred format for the data. If SAS is not your preferred format then please let me know - I can readily translate the data into other formats eg SPSS, Stata, Excel, ASCII)

2. A description of the variables supplied

3. Copies of several papers from the CHDS referred to in the variable description. I have not referred to or attached any of our abuse papers since I presume you are familiar with these. However, if you would like copies of these also please let me know.

The dataset contains information for all 1265 participants who entered the CHDS at birth. However, due to sample attrition, etc the numbers with non missing data on any given variable may be substantially lower than this, depending on how the variable was constructed and the age(s) at which it was assessed.

In particular, the assessment of abuse at ages 18, 21 years was made on samples of just over 1000 respondents. The outcome measures I have supplied were assessed at age 25. Again, just over 1000 were assessed at this age. However, since not all participants were assessed at all ages the numbers with non-missing data on both abuse exposure and outcomes will be closer to 975. The sample size will drop further as you add in covariates.

Depending on how sophisticated you wish to get with your statistical modeling, you may wish to use missing data estimation or data weighting methods to take into account possible selection bias arising from the processes leading to missing data. Reassuringly from our perspective we typically do not find evidence of marked selection bias effects in the cohort.

There is a total of 42 variables in the data set. I have tried to keep as close as possible to your wish list. The variable description details how the supplied variables differ from your stated preference. There were two variables I could not provide:

(a) Age - the cohort members are all the same age, having all been born in a 4 month period in mid-1977. Thus the only age that is relevant is the age at assessment of the variables.

(b) Raised in urban/rural - I can't provide a useful measure for this variable. However, only a small minority of the cohort (<10%) would have been raised in a truly rural setting.

Please let me know if anything is unclear or you would like some additional information. Otherwise good luck with your project. Regards, John

•

Appendix I: Childhood Experiences of Violence Questionnaire Short Form (CEVQ-SF)

We would like to ask you some questions about bad things that happen to some children. What we learn from your answers might help other children. If a question is too hard for you, go to the next one. All of your answers will be kept private.

1. Sometimes kids get hassled or picked on by other kids who say hurtful or mean things to them. How many times did this happen to you before age 16?

- □ Never
- \Box 1 or 2 times
- \Box 3 to 5 times
- \Box 6 to 10 times
- \Box More than 10 times

2. When did this happen? MARK ALL THAT APPLY.

- □ Before you began grade school?
- □ While you were in grade school?
- \Box While you were in high school?

3. Sometimes kids get pushed around, hit or beaten up by other kids or a group of kids. How many times did this happen to you before age 16?

- □ Never
- \Box 1 or 2 times
- \Box 3 to 5 times
- \Box 6 to 10 times
- □ More than 10 times

4. When did this happen? MARK ALL THAT APPLY.

- □ Before you began grade school?
- □ While you were in grade school?
- □ While you were in high school?

5. How many times before age 16 did an adult spank you with their hand on your bottom (bum), or slap you on your hand?

- □ Never
- \Box 1 or 2 times

- \Box 3 to 5 times
- \Box 6 to 10 times
- □ More than 10 times
- 6. When did this happen? MARK ALL THAT APPLY.
 - □ Before you began grade school?
 - \Box While you were in grade school?
 - \Box While you were in high school?

7. How many times before age 16 did an adult slap you on the face, head or ears or hit or spank you with something like a belt, wooden spoon or something hard?

- □ Never
- \Box 1 or 2 times
- \Box 3 to 5 times
- \Box 6 to 10 times
- □ More than 10 times

8. When did this happen? MARK ALL THAT APPLY.

- □ Before you began grade school?
- □ While you were in grade school?
- □ While you were in high school?

9. Before age 16 did an adult push, grab, shove or throw something at you to hurt you?

- □ Never
- \Box 1 or 2 times
- \Box 3 to 5 times
- \Box 6 to 10 times
- \Box More than 10 times

10. When did this happen? MARK ALL THAT APPLY.

- □ Before you began grade school?
- □ While you were in grade school?
- □ While you were in high school?

11. Before age 16 how many times did an adult kick, bite, punch, choke, burn you, or physically attack you in some way?

- □ Never
- \Box 1 or 2 times
- \Box 3 to 5 times
- \Box 6 to 10 times
- \Box More than 10 times

12. When did this happen? MARK ALL THAT APPLY.

- \Box Before you began grade school?
- \Box While you were in grade school?
- \Box While you were in high school?

13. Before age 16 when you were growing up, did anyone ever do any of the following things when you didn't want them to: touch the private parts of your body or make you touch their private parts, threaten or try to have sex with you or sexually force themselves on you?

- □ Never
- \Box 1 or 2 times
- \Box 3 to 5 times
- \Box 6 to 10 times
- \Box More than 10 times

14. When did this happen? MARK ALL THAT APPLY.

- □ Before you began grade school?
- □ While you were in grade school?
- \Box While you were in high school?

Appendix J: Childhood Experiences of Violence Questionnaire (CEVQ)

answers will be kept strictly confidential. All your answers are private. We will not tell your parents, teachers, or anyone else about anything you have answered on this form. If you need help or would like to talk to someone about any of these experiences you can call Kid's Help Phone at 1-800-668-6868 or you can call any of the numbers list on the information sheet you will be given. This questionnaire asks about things that may have happened to you in your school, in your neighbourhood, or in your family. It will ask questions about some situations where you might have been hurt or afraid you were going to get hurt. All your

Please do the practice question before you begin. Put fill in the circle (O) to mark your answer.

Practice Question:

Sometimes kids get a bad cold or the flu.

How many times has this ever happened to you? (If never,	a. When did this happen?	b. Have you ever seen a
go to question z) O Never	O Before grade school	0 Yes
0 1 to 2 times	O In grades 1 to 5	O No
0 3 to 5 times	O In grades 6 to 8	
0 6 to 10 times	O In high school	
O More than 10 times	O Is happening now	

c. Have you ever told anyone about	d. If yes, who did you tell? Please mark all that
this?	apply.
0 Yes	O Parent / step-parent / guardian
O No	O Teacher / guidance counselor
	O Children's Aid Worker
	O Friend
	0 Other, Who?

2) If you filled in "Never" to Question #1 above, you should be reading this.

If you filled in "1to 2 times" OR "3 to 5 times" OR "6 to 8 times" OR "More than 10 times" to question #1 above, you should have answered Questions a, b, c, and d, then you should be reading this. Please turn the page and begin question #1.

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

How many times has this happened	a. When did this happen?	b. Who did this to you?
to you? (If never, go to question 2).	Please mark all that apply.	Please mark all that apply.
0 Never	O Before grade school	O Brother / Sister / Stepbrother / Stepsister
0 1 to 2 times	O In grades 1 to 5	O Kids at school
O 3 to 5 times	O In grades 6 to 8	O Kids in your neighbourhood
O 6 to 10 times	O In high school	O Boyfriend / Girlfriend
O More than 10 times	O Is happening now	O Other, Who?

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

How many times has this happened to you? (If never, go to question 3).	a. When did this happen? Please mark all that apply.	b. Who did this to you? Please mark all that apply.	c. Have you ever seen a doctor because of this?
O Never	O Before grade school	O Brother / Sister / Stepbrother / Stepsister	0 YES
O 1 to 2 times	O In grades 1 to 5	O Kids at school	ON O
0 3 to 5 times	O In grades 6 to 8	O Kids in your neighbourhood	
0 6 to 10 times	O In high school	O Boyfriend / Girlfriend	
O More than 10 times	O Is happening now	O Other, Who?	

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

ionici adam in Joan nomo	
(If never, go to question 4)	a. When did this happen?
	Please mark all that apply.
O Never	O Before grade school
0 1 to 2 times	O In grades 1 to 5
O 3 to 5 times	O In grades 6 to 8
O 6 to 10 times	O In high school
O More than 10 times	O Is happening now

Was the person who did this drinking alcohol at the time? Was the person who did this was using drugs at the time?

DON'T KNOW	DON'T KNOW	
N	NO	
YES	YES	

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

(If never, go to question 5)	a. When did this happen? Please mark all that apply.	 Were the police ever called because of this? 	 c. Did anyone go to hospital because of this?
O Never	O Before grade school	O YES	0 YES
0 1 to 2 times	O In grades 1 to 5	O NO	O NO
0 3 to 5 times	O In grades 6 to 8		
O 6 to 10 times	O In high school		
O More than 10 times	O Is happening now		

d. Have you ever told anyone about	e. If yes, who did you tell?
this?	Please mark all that apply.
0 YES	O Parent / Step-parent / Guardian
O NO	O Teacher / Guidance Counsellor
	O Children's Aid Worker
	O Friend
	O Other, who?

Was the person who did this drinking alcohol at the time? Was the person who did this using drugs at the time?

DON'T KNOW DON'T KNOW

9 9

YES YES

(If never, go to question 6)	a. When did this happen?
	Please mark all that apply.
O Never	O Before grade school
0 1 to 2 times	O In grades 1 to 5
O 3 to 5 times	O In grades 6 to 8
O 6 to 10 times	O In high school
O More than 10 times	O Is happening now

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

Was the person who did this drinking alcohol at the time? Was the person who did this using drugs at the time?

DON'T KNOW DON'T KNOW

9 Q

YES

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

(If never, go to question 7)	a. When did this happen?	b. Who did this to you?
	Please mark all that apply.	Please mark all that apply.
O Never	O Before grade school	0 Father
0 1 to 2 times	O In grades 1 to 5	O Mother
O 3 to 5 times	O In grades 6 to 8	O Step-father / Mother's boyfriend
O 6 to 10 times	O In high school	O Step-mother / Father's girlfriend
O More than 10 times	O Is happening now	O Relative, Who?
		0 Other, Who?
If you chose "Relative," were they:	0 MALE 0 AT	EENAGER
	O FEMALE O AN	ADULT
If you chose "Other," were they:	O MALE O AT	EENAGER
	O FEMALE O AN	ADULT

Was the person who did this drinking alcohol at the time? Was the person who did this using drugs at the time?

YES NO DON'T KNOW YES NO DON'T KNOW

many times has an adult slapped you on the face, head or ears or hit or spanked you with something like a wooden spoon or something hard?
 How many time belt, wooden sp

(If never, go to question 8)	a. When did this happen?	b. Who did this to you?
	Please mark all that apply.	Please mark all that apply.
0 Never	O Before grade school	O Father
0 1 to 2 times	O In grades 1 to 5	O Mother
0 3 to 5 times	O In grades 6 to 8	O Step-father / Mother's boyfriend
O 6 to 10 times	O In high school	O Step-mother / Father's girlfriend
O More than 10 times	O Is happening now	O Relative, Who?
		0 Other, Who?

O MALE O A TEENAGER	O MALE O A TEENAGER
O FEMALE O AN ADULT	O FEMALE O AN ADULT
you chose "Relative," were they:	you chose "Other," were they:

Was the person who did this drinking alcohol at the time? Was the person who did this using drugs at the time?

9 Q YES YES

DON'T KNOW DON'T KNOW

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

o: How many much into an aran ban	(()) () () () () ()	
(If never, go to question 9)	a. When did this happen?	b. Who did this to you?
	Please mark all that apply.	Please mark all that apply.
O Never	O Before grade school	O Father
0 1 to 2 times	O In grades 1 to 5	O Mother
0 3 to 5 times	O In grades 6 to 8	O Step-father / Mother's boyfriend
0 6 to 10 times	O In high school	O Step-mother / Father's girlfriend
O More than 10 times	O Is happening now	O Relative, Who?
		0 Other, Who?

If you chose "Relative," were they:

If you chose "Other," were they:

0 MALE 0 FEMALE 0 MALE 0 FEMALE

0 A TEENAGER 0 AN ADULT 0 A TEENAGER 0 AN ADULT

218

Vas the person who did this drinking alco Vas the person who did this using drugs :	hol at the time? YES at the time? YES	ON ON	DON'T KNOW DON'T KNOW	
c. Have you ever seen a doctor because of this?	d. Have you ever told anyone about this?	e. If yes, who c Please mark al	did you tell? II that apply.	
0 YES	0 YES	O Parent / Step	o-parent / Guardian	
ON 0	ON O	0 Teacher / Gu	uidance Counsellor	
		O Children's Ai	id Worker	
		O Friend		
		O Other, who?		

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7. How many times has an adult throw	/n something at you to hurt you?	
(If never, go to question 10)	a. When did this happen?	b. Who did this to you?
	Please mark all that apply.	Please mark all that apply.
O Never 0	D Before grade school	O Father
0 1 to 2 times	0 In grades 1 to 5	O Mother
0 3 to 5 times	O In grades 6 to 8	O Step-father / Mother's boyfriend
O 6 to 10 times	O In high school	O Step-mother / Father's girlfriend
O More than 10 times	D Is happening now	O Relative, Who?
		0 Other, Who?
If you chose "Relative," were they: 0	MALE O A TEENA	GER
0	FEMALE O AN ADUL	T
If you chose "Other," were they: 0	MALE O A TEENA	GER
0	FEMALE O AN ADUL	T
Was the person who did this drinking alcoho	I at the time?	NO DON'T KNOW
Was the person who did this using drugs at	the time? YES	NO DON'T KNOW
c. Have you ever seen a doctor because	d. Have you ever told anyone	e. If yes, who did you tell?
of this?	about this?	Please mark all that apply.
O YES	0 YES	O Parent / Step-parent / Guardian
O NO	O NO	O Teacher / Guidance Counsellor
		O Children's Aid Worker
		O Friend
		O Other, who?

219

8. How many times has an adult kicked,	bit, or punched you to hurt you?	
(If never, go to question 11)	a. When did this happen? Please mark all that apply.	b. Who did this to you? Please mark all that apply.
O Never	O Before grade school	O Father
0 1 to 2 times	O In grades 1 to 5	O Mother
0 3 to 5 times	O In grades 6 to 8	O Step-father / Mother's boyfriend

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0 6 to 10 times	O In high school	0	Step-mo	ther / Father's girlfriend	
O More than 10 times	O Is happening now	0	Relative	, Who?	
		0	Other, W	/ho?	11
If vou chose "Relative." were they: 0 M	ALE	O A TEENAGER	~		
0 Fi	EMALE	O AN ADULT			
If vou chose "Other," were they: 0 M	ALE	O A TEENAGER	~		
0 FI	EMALE	O AN ADULT			
Was the nerson who did this drinking alcohol	at the time?	YES	ON	DON'T KNOW	
Was the person who did this using drugs at th	e time?	YES	NO	DON'T KNOW	

c. Have you ever seen a doctor	d. Have you ever told anyone about	e. If yes, who did you tell?
because of this?	this?	Please mark all that apply.
O YES	0 YES	O Parent / Step-parent / Guardian
ON O	O NO	O Teacher / Guidance Counsellor
		O Children's Aid Worker
		O Friend
		0 Other, who?

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

(If never, go to question 12)	a. When did this happen?	b. Who did this to you?
	Please mark all that apply.	Please mark all that apply.
0 Never	O Before grade school	O Father
0 1 to 2 times	O In grades 1 to 5	O Mother
0 3 to 5 times	O In grades 6 to 8	O Step-father / Mother's boyfriend
0 6 to 10 times	O In high school	O Step-mother / Father's girlfriend
O More than 10 times	O Is happening now	O Relative, Who?
		0 Other, Who?

f you chose "Relative," were they	Z O MALE	O A TEENAGER	
	O FEMALE	O AN ADULT	
If you chose "Other," were they:	O MALE	O A TEENAGER	
	O FEMALE	O AN ADULT	
Was the person who did this drin	hking alcohol at the time?	YES NO	DON'T KNOW
Was the person who did this usi	ng drugs at the time?	YES NO	DON'T KNOW
c. Did this ever involve a	d. Have you ever seen a	e. Have you ever told	f. If yes, who did you tell?
weapon, like a knife or a gun?	doctor because of this?	anyone about this?	Please mark all that apply
O YES	O YES	0 YES	O Parent / Step-parent /
			Citoredian

T. IT yes, who did you tell? Please mark all that apply.	O Parent / Step-parent / Guardian	O Teacher / Guidance Counsellor	O Children's Aid Worker	O Friend	O Other, who?	
e. nave you even told anyone about this?	0 YES	ON O				
u. nave you ever seen a doctor because of this?	0 YES	ON O				
c. Did this ever involve a weapon, like a knife or a gun?	0 YES	ON O				

Did anyone ever show their private parts to you when you didn't want them to? (If <u>NO</u>, go to question #13).
 O YES
 O NO

	U NU	
a. How many times has this happened	b. When did this happen?	c. Who did this to vou?
to you?	Please mark all that apply.	Please mark all that apply.
0 1 to 2 times	O Before grade school	O Father
O 3 to 5 times	O In grades 1 to 5	O Mother
O 6 to 10 times	O In grades 6 to 8	O Step-father / Mother's bovfriend
O More than 10 times	O In high school	O Step-mother / Father's girlfriend
	O Is happening now	O Relative. Who?
		O Other, Who?
C modt norm " oritolo", orodo nor M	MALE O A TEENIO	

IT you chose Helative, were triey.

0 MALE 0 FEMALE 0 MALE 0 FEMALE If you chose "Other," were they:

0 A TEENAGER 0 AN ADULT 0 A TEENAGER 0 AN ADULT

221

DON'T KNOW DON'T KNOW 2 2 YES YES Was the person who did this drinking alcohol at the time? Was the person who did this using drugs at the time?

d Have voli ever told anvone about	e. If ves. who did vou tell?
this?	Please mark all that apply.
0 YES	O Parent / Step-parent / Guardian
ON O	O Teacher / Guidance Counsellor
	O Children's Aid Worker
	O Friend
	O Other, who?

13. Did anyone ever make you show them your private parts when you did not want them to? (If NO, go to question #14).

0 YES 0 NO

a. How many times has this happened	b. When did this happen? Desce mark all that annly	c. Who did this to you? Please mark all that apply	_
0 1 to 2 times	O Before grade school	O Father	_
0 3 to 5 times	O In grades 1 to 5	O Mother	_
O 6 to 10 times	O In grades 6 to 8	O Step-father / Mother's boyfriend	
O More than 10 times	O In high school	O Step-mother / Father's girlfriend	
	O Is happening now	O Relative, Who?	
		O Other Who?	

				•
O MALE	O FEMALE	O MALE	O FEMALE	
If you chose "Relative," were they:		If you chose "Other," were they:		

Was the person who did this drinking alcohol at the time? Was the person who did this using drugs at the time?

	DON'T KNOW DON'T KNOW
ier ier	ON ON
0 A TEENAG 0 AN ADULT 0 A TEENAG 0 AN ADULT	YES YES

222

d. Have you ever told anyone about	e. If yes, who did you tell?
this?	Please mark all that apply.
0 YES	O Parent / Step-parent / Guardian
O NO	O Teacher / Guidance Counsellor
	O Children's Aid Worker
	O Friend
	0 Other, who?

14. Did anyone ever threaten to have sex with you when you did not want them to? (If NO, go to question #15).

0 YES

O MALE	O FEMALE	O MALE	O FEMALE
If you chose "Relative," were they:		If you chose "Other," were they:	

O A TEENAGER O AN ADULT O A TEENAGER O AN ADULT

Was the person who did this drinking alcohol at the time? Was the person who did this using drugs at the time?

YES NO DON'T KNOW YES NO DON'T KNOW

c. Have you ever seen a doctor because	d. Have you ever told anyone	e. If yes, who did you tell?
of this?	about this?	Please mark all that apply.
0 YES	O YES	O Parent / Step-parent / Guardian
ON O	ON O	O Teacher / Guidance Counsellor
		O Children's Aid Worker
		O Friend
		0 Other, who?

15. Did anyone ever touch the private parts of your body or made you touch their private parts when you did not want them to? (*If NO*, go to question #16).

O YES O NO

a. How many times has this happened to	b. When did this happen?	c. Who did this to you?
you?	Please mark all that apply.	Please mark all that apply.
0 1 to 2 times	O Before grade school	O Father
0 3 to 5 times	O In grades 1 to 5	O Mother
0 6 to 10 times	O In grades 6 to 8	O Step-father / Mother's boyfriend
O More than 10 times	O In high school	O Step-mother / Father's girlfriend
	O Is happening now	O Relative, Who?
		0 Other, Who?
If you chose "Relative," were they: 0 M/	NLE O A TEENAG	3ER
0 FE	MALE O AN ADULT	
If you chose "Other," were they: 0 M/	NLE O A TEENAG	ier
0 FE	MALE O AN ADULT	
Was the person who did this drinking alcohol a	t the time? YES	NO DON'T KNOW
Was the person who did this using drugs at the	e time? YES	NO DON'T KNOW
c. Have you ever seen a doctor because	d. Have you ever told anyone	e. If yes, who did you tell?
of this?	about this?	Please mark all that apply.
0 YES	O YES	O Parent / Step-parent / Guardian
O NO	O NO	O Teacher / Guidance Counsellor
		O Children's Aid Worker

224

0 Friend 0 Other, who? 16. Did anyone ever have sex with you when you didn't want them to or sexually force themselves on you in some other way? (*lf <u>NO</u>, go to question #17*).

0 YES 0 NO

a. How many times has this	b. When did this happen?	c. Who did this to you?
nappened to you?	C Defere mark all that apply.	C Cothor
0 1 to 2 times	U Delore grade scridol	U rainer
O 3 to 5 times	O In grades 1 to 5	O Mother
O 6 to 10 times	O In grades 6 to 8	O Step-father / Mother's boyfriend
O More than 10 times	O In high school	O Step-mother / Father's girlfriend
	O Is happening now	O Relative,
		Who?
		O Other,
		Who?

EALE	ALE
e," were they: O FFM	were they: 0 FEM/
you chose "Relative	you chose "Other,"

Was the person who did this drinking alcohol at the time? Was the person who did this using drugs at the time?

0 A TEENAGER 0 AN ADULT 0 A TEENAGER 0 AN ADULT

N ADULT

YES NO DON'T KNOW YES NO DON'T KNOW

c. Have you ever seen a doctor because	d. Have you ever told anyone	e. If yes, who did you tell?
of this?	about this?	Please mark all that apply.
0 YES	0 YES	O Parent / Step-parent / Guardian
O NO	O NO	0 Teacher / Guidance Counsellor
		O Children's Aid Worker
		O Friend
		O Other, who?

17. Did anyone ever make you see magazines, pictures, videos, Internet sites, etc., that had to do with sex when you did not want to see it? (If <u>NO</u>, go to the next page).

YES	92
0	0

a. How many times has this happened to vou?	b. When did this happen? Please mark all that apply.	c. Who did this to you? Please mark all that apply.
0 1 to 2 times	O Before grade school	0 Father
0 3 to 5 times	O In grades 1 to 5	O Mother
O 6 to 10 times	O In grades 6 to 8	O Step-father / Mother's boyfriend
O More than 10 times	O In high school	O Step-mother / Father's girlfriend
	O Is happening now	O Relative, Who?
		O Other, Who?

 c. Have you ever seen a doctor be of this? 	ecause	d. Have you ever told ar about this?	nyone	e. If yes, who d Please mark all	lid you tell? I that apply.
Was the person who did this using dru	ugs at the t	ime?	YES	ON	DON'T KNOW
Nas the person who did this drinking	alcohol at t	the time?	YES	NO	DON'T KNOW
	O FEM	ALE	O AN ADULT		
If you chose "Other," were they:	0 MAL	Ë	O A TEENAG	ier	
If you chose "Relative," were they:	O MAL	Е АLE	O A TEENAG	ien -	

c. Have you ever seen a doctor because	d. Have you ever told anyone	e. If yes, who did you tell?
of this?	about this?	Please mark all that apply.
O YES	O YES	O Parent / Step-parent / Guardian
ON O	O NO	O Teacher / Guidance Counsellor
		O Children's Aid Worker
		O Friend
		0 Other, who?

.